DURALIE COAL MINE
Rehabilitation Management Plan

Rehabilitation Management Plan Summary Table

DURALIE COAL MINE REHABILITATION MANAGEMENT PLAN SUMMARY TABLE		
Name of Mine:	Duralie Coal Mine	
Name of Lease Holder(s):	CIM Duralie Pty Ltd / CIM Services Pty Ltd	
Name of Mine Operator:	Duralie Coal Pty Ltd	
Rehabilitation Management Plan Commencement Date:	1 July 2022	
Rehabilitation Management Plan Revision Dates and Version Numbers:	Version 1 – Original 01144360	July 2022
	Version 2 – Updated to reflect consultation with key stakeholders and amended FLRP. 01166540	January 2023
	Version 3 – Updated to reflect approval of the ROBJ and FLRP. 01191082-003	October 2023
Mining Lease(s) / Lease Numbers / Expiry Dates:	Mining Lease 1427	Expiry Date: 6 April 2019
	Mining Lease 1646	Expiry Date: 4 January 2032
Date of Submission:	30 June 2022	

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1 INTRODUCTION TO MINING PROJECT

1.1 HISTORY OF OPERATIONS

1.1.1 Mine Operator and Proprietors

Duralie Coal Pty Ltd (DCPL), a wholly owned subsidiary of Yancoal Australia Limited, owns and operates the Duralie Coal Mine (DCM). The DCM is an existing mine located approximately 10 kilometres (km) north of the village of Stroud and approximately 20 km south of Stratford in the Gloucester Valley in New South Wales (NSW) (Figure 1). The DCM is situated adjacent to Mammy Johnsons River within the Karuah River Catchment, between the townships of Wards River and Stroud Road. The NSW Minister for Urban Affairs and Planning granted Development Consent for the DCM in August 1997 and coal production commenced in 2003.

Development of the DCM is approved under Mining Leases (MLs) 1427 and 1646 and NSW Project Approval (08_0203). Other key approvals, licences and permits for the DCM are described in Section 1.2.

This Rehabilitation Management Plan (RMP) has been prepared by DCPL in accordance with the new standard rehabilitation conditions on mining leases imposed through an amendment to the Regulation under the *Mining Act 1992*. This RMP has been prepared in accordance with Condition 2 of ML 1427 and Condition 3 of ML 1646 (relevant to preparation of an RMP) and addresses the requirements for the DCM RMP provided within Condition 57, Schedule 3 of the Project Approval (08_0203).

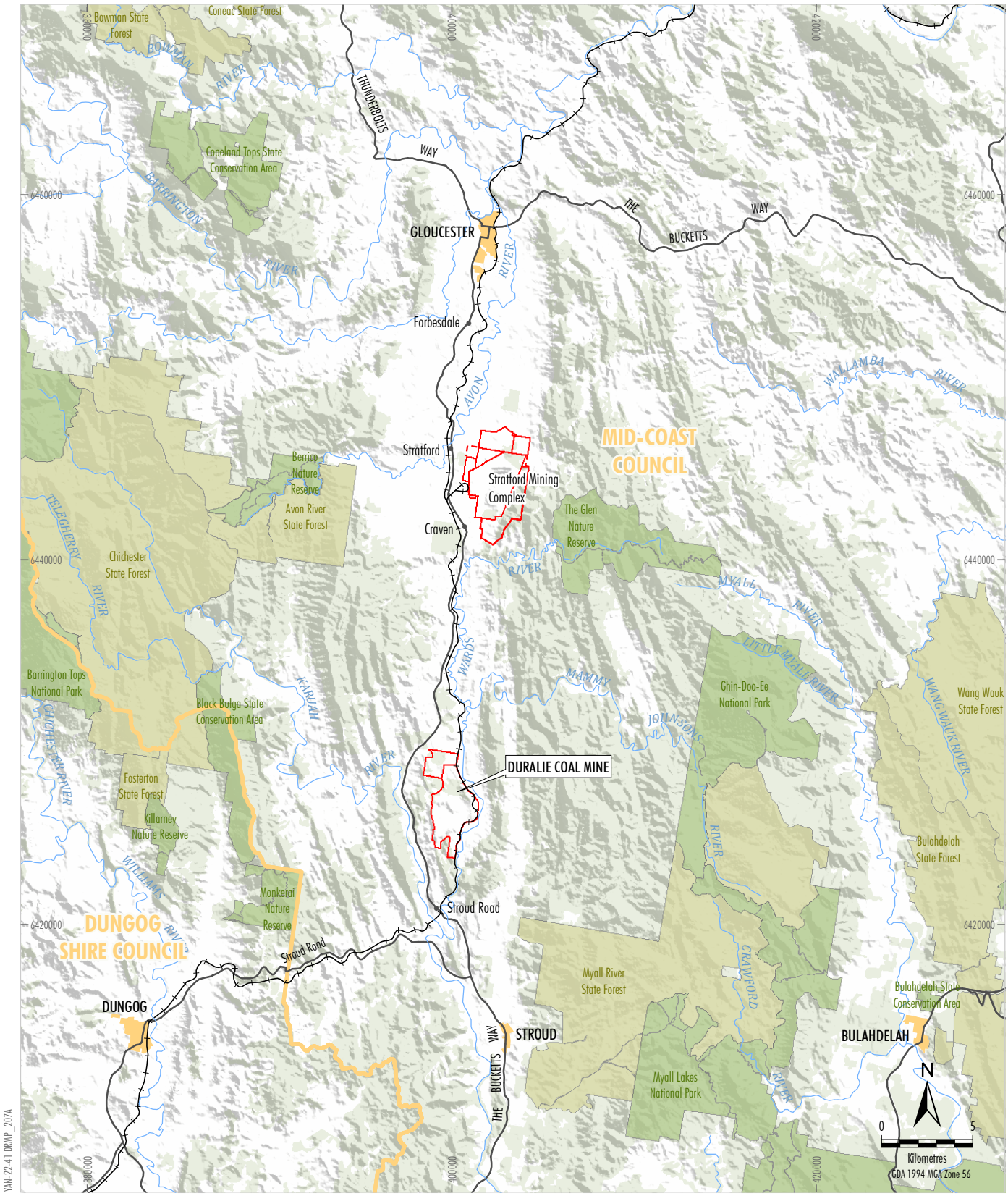
This RMP describes the proposed rehabilitation activities for the DCM and the assessments and activities that have been implemented as part of the DCM Mine Closure Plan and Schedule, which has been prepared in accordance with the requirements of a notice issued under section 240(1)(C) of the NSW *Mining Act 1992* by the NSW Resources Regulator on 31 August 2021. The outcomes of completed components of the DCM Mine Closure Plan and Schedule have informed or been considered in the preparation of this RMP. This RMP replaces the DCM Mining Operations Plan (MOP)/RMP (1 January 2020 to 31 December 2021).

1.1.2 Significant Surface Disturbing Activities – Mining Operations, Ancillary Mining Activities and Exploration

Construction at the DCM commenced in June 2002 with mining production commencing in March 2003. The first coal railed to the Stratford Mining Complex (SMC) for processing was in March 2003. Open cut mining at the DCM has been conducted in the Clareval Open Pit and Weismantel Open Pit.

The main activities associated with the approved Duralie Extension Project (DEP) (as modified) include:

- continued development of open cut mining operations at the DCM to facilitate a total run-of-mine (ROM) coal production rate of up to approximately 3 million tonnes per annum, including:
  - extension of the existing approved open pit in the Weismantel Seam to the north-west (i.e. Weismantel open pit) within Mining Lease (ML) 1427 and ML 1646; and
  - open cut mining operations in the Clareval Seam (i.e. Clareval open pit) within ML 1427 and ML 1646;
- ongoing exploration activities within existing exploration tenements;



YAN-22-41 DRNP_207A

LEGEND

- Mining Lease Boundary
- NSW State Forest
- National Park, Nature Reserve or State Conservation Area
- Local Government Area Boundary

Source: Geoscience Australia (2006); NSW Department of Planning & Environment (2017)

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Regional Location

Figure 1

- progressive backfilling of the open pits with waste rock as mining develops, and continued and expanded placement of waste rock in out-of-pit waste rock emplacements;
- increased ROM coal rail transport movements on the North Coast Railway between the DCM and the Stratford Mining Complex (SMC) in line with increased ROM coal production;
- continued disposal of excess water through irrigation (including development of new irrigation areas within the existing ML 1427 and ML 1646) (refer below regarding status of irrigation at the DCM);
- construction of Auxiliary Dam No. 2 to relative level 100 metres (m) to provide 2,900 megalitres of on-site storage capacity to manage excess water on-site;
- progressive development of dewatering bores, pumps, dams, irrigation infrastructure and other water management equipment and structures;
- development of new haul roads and internal roads;
- upgrade of existing surface facilities and supporting infrastructure as required in line with increased ROM coal production;
- continued development of soil stockpiles, laydown areas and gravel/borrow pits;
- establishment of the permanent Coal Shaft Creek Diversion alignment adjacent to the existing DCM mining area;
- ongoing surface monitoring and rehabilitation; and
- other associated minor infrastructure, plant, equipment and activities.

The activities associated with the approved Duralie Open Pit Modification include:

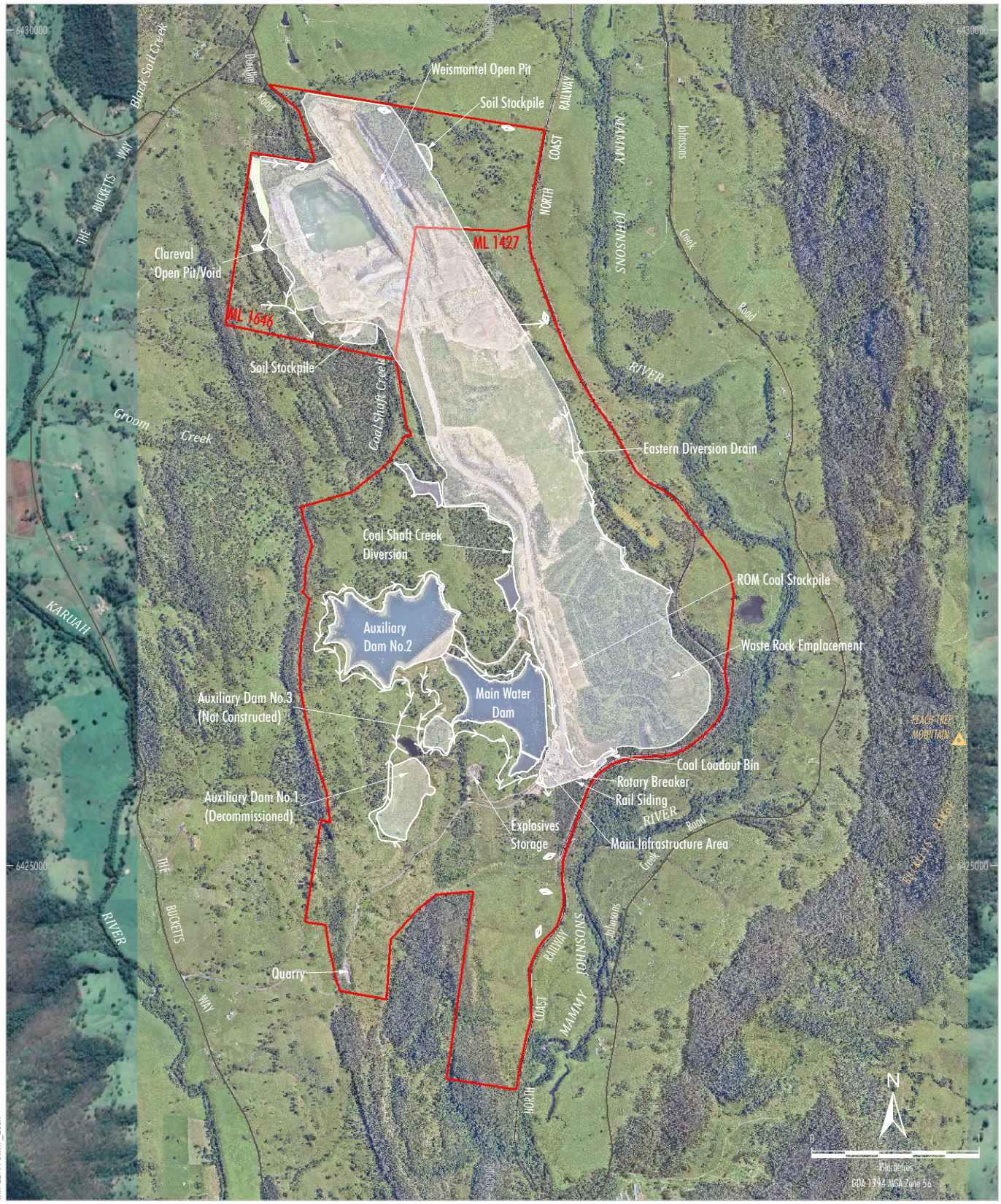
- an increase in the maximum depth of the Clareval Open Pit;
- a minor increase in the extent of surface development of the DCM of approximately 2.5 hectares (ha), resulting from:
  - a reduction in low wall angles of the Clareval Open Pit and the removal of a pillar between the Clareval and Weismantel open pits to improve geotechnical stability; and
  - associated relocation of the up-catchment diversion to the west of the Clareval Open Pit;
- revision of mining sequence (i.e. progression of mining in the Clareval and Weismantel open pits); and
- an increase in height of the waste rock emplacement (i.e. the backfilled open pit) from approximately 110 m Australian Height Datum (AHD) to approximately 135 m AHD.

The general arrangement of the DCM, showing modifications, is provided in Figure 2.

Current Status of the DCM

Condition 5, Schedule 2 of Project Approval (08_0203) authorises mining operations to be carried at the DCM until 31 December 2021.

Accordingly, DCPL has commenced the mine closure phase (i.e. following the cessation of mining operations on 31 December 2021). This RMP describes the proposed rehabilitation activities for the DCM and the assessments and activities implemented as part of the DCM Mine Closure Plan and Schedule (Appendix 1).



LEGEND

- Mining Lease Boundary
- Approximate Extent of Existing/Approved Surface Development
- Existing/Approved First Flush Protocol Pump Back System
- Existing/Approved Up-catchment Diversion System

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

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DCM General Arrangement

Figure 2

YAN-22-41 DRNP_208A

Operations at the DCM now reflect the transition towards mine closure:

- **Clareval Open Pit**: mining of the Clareval Open Pit is completed, and dewatering of the pit has ceased. Partial backfilling with waste rock mined from the Weismantel Open Pit has commenced, along with shaping of the pit area to its final landform design. Mining of the Clareval Open Pit was finalised to a shallower depth than the maximum approved depth as modelled in 2014 DCM Open Pit Modification.
- **Weismantel Open Pit**: mining of the Weismantel Open Pit continued up to 31 December 2021, however, did not occur to the maximum approved depth as modelled in 2014 DCM Open Pit Modification. Progressive backfilling of completed areas of the Weismantel Open Pit has been undertaken.
- **DCM Water Management System Changes**:
  - Following the cessation of mining of the Clareval Open Pit (now final void) and the Clareval void becoming available as a water storage, Weismantel Open Pit dewatering is preferentially transferred to the Clareval void and not stored within the Main Water Dam (MWD). As a result, all irrigation activities for the purpose of reducing the total site water inventory at the DCM have ceased and the DCM's Irrigation Area irrigation system has been decommissioned and removed.
  - Decommissioning of other redundant water management structures has also commenced. Consistent with the approved DCM final landform design, Auxiliary Dam No. 1 has been dewatered, decommissioned and rehabilitated.
- **Vegetation Clearance**: No new disturbance areas (within approved surface disturbance areas) are proposed.
- **Closure Planning**: The DCM Mine Closure Plan and Schedule includes technical assessments and works that will be undertaken and implemented as part of the DCM mine closure phase. Key components of the DCM Mine Closure Plan and Schedule include:
  - Preparation of a detailed final landform design, including final void design.
  - Review and update of the site groundwater model and site water balance (including final void water balance) based on the refined final landform design.
  - Preparation of other key strategies and assessments (including a detailed Decommissioning Strategy for Mine Water Dams; and preparation of the final Coal Shaft Creek Reconstruction Plan).
  - Undertaking Stakeholder Engagement to communicate the DCM's mine closure process with relevant stakeholders.
  - Review and update as required, existing environmental management plans for the rehabilitation and mine closure stage of operations.

DCPL is progressively completing components of the DCM Mine Closure Plan and Schedule (Appendix 1), with the various technical assessments currently being completed based on the refined final landform design. The outcomes from these reviews and DCM Mine Closure Plan and Schedule technical assessments and works will be incorporated into a DCM Mine Closure Plan and Schedule (Appendix 1).

DCM Activities following Cessation of Mining Operations

Following the completion of mining operations (and the cessation of rail movements of ROM coal) on 31 December 2021, key activities at the DCM include:

- infrastructure decommissioning and demolition;
- bulk rehabilitation earthworks (which may include final blasting to achieve final landform design);

- revegetation of final landform in accordance with this RMP;
- removal of all mining fleet, major earthworks fleet and drilling fleet from the DCM;
- phase out of workforce (including transition of partial workforce to SMC); and
- refinement of monitoring programs and environmental management plans to reflect rehabilitated site.

1.1.3 Rehabilitation Undertaken Since Mine Commencement – Decommissioning/Demolition of Infrastructure.

Rehabilitation of disturbed areas has been undertaken progressively throughout mining operations in accordance with the previous MOP/RMPs and is continuing into the mine closure phase. DCPL has successfully undertaken rehabilitation activities at the DCM over approximately 158 ha of the waste emplacement (i.e. shaped, covered with topsoil and revegetated). The southern section of the waste rock emplacement has been completed and progressive rehabilitation will continue to advance to the north.

Rehabilitation works on the southern sections of the waste emplacement have been effectively completed. Native endemic woodland shrubs and trees have been successfully established across these sections of the waste emplacement. The waste emplacement has been constructed with an overall outer batter slope of approximately 1 Vertical (V):4 Horizontal (H). Following the development of drainage structures, the waste rock has been covered with 100 to 150 millimetres (mm) of topsoil. Following topsoil placement, site preparation works have included shallow ploughing along contours, depending on the vegetation type to be established.

Approximately 55 ha of the waste emplacement has been rehabilitated with pasture species. Pasture rehabilitation is generally confined to flatter sections of the waste emplacement, whilst native endemic woodland areas are planted on the slopes and batters.

Rehabilitation works to the north of the 132 kilovolt powerline corridor have been undertaken with a combination of endemic woodland and pasture areas.

Plates 1 to 12 provide examples of the progression of rehabilitation phases and successful rehabilitation undertaken at the DCM.

1.2 CURRENT DEVELOPMENT CONSENTS, LEASES AND LICENCES

Details of the date of grant and duration of the Project Approval, authorisations and licenses issued by the relevant government agencies for the DCM are provided in Table 1.

Plate 1: Landform Establishment – Bulk Shaping

Plate 2: Landform Establishment – Bulk Shaping and Topsoil Spreading

Plate 3: Growth Medium Development – Topsoil Spreading

Plate 4: Ecosystem Establishment – Pasture Germination

YAN-22-41 DRMP__001A

Source: DCPL (2019)

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Duralie Coal Mine
Waste Emplacement Rehabilitation

Plates 1-4

Plate 5: Ecosystem Establishment – Pasture Establishment

Plate 6: Ecosystem Establishment – Native Vegetation Species Germination

Plate 7: Ecosystem Establishment – Native Vegetation Species (2 years old)

Plate 8: Ecosystem Establishment – Flowering Eucalypt Species (3 years old)

Source: DCPL (2019)

YAN-22-41 DRMP_002A

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Waste Emplacement Rehabilitation

Plates 5-8

Plate 9: Ecosystem Establishment – Flowering Acacia Species (3 years old)

Plate 10: Ecosystem Establishment – Native Vegetation (3 years old)

Plate 11: Ecosystem Establishment – Native Vegetation and Pasture (mixed ages)

Plate 12: Ecosystem Sustainability – Native Vegetation (8 years old)

YAN-22-41 DRMP_003A

Source: DCPL (2019)

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Duralie Coal Mine
Waste Emplacement Rehabilitation

Plates 9-12

Table 1:
Overview of Current Development Consents, Leases and Licences

Relevant Authority	Instrument	Approval/Licence No.	Issue Date	Expiry Date
Department of Planning and Environment (DPE)	Project Approval	PA 08_0203 (as modified)	5/12/2014	The Applicant may carry out mining operations on-site until 31 December 2021.
Resources Regulator	Mining Lease	ML 1427	6/4/1998	21 years (renewal application pending).
		ML 1646	4/1/2011	21 years.
	Exploration Licence	AUTH 315	14/10/2013	28 November 2017. Renewal lodged 27/11/2017 and is currently pending.
Environment Protection Authority (EPA)	Environment Protection Licence	EPL 11701 (as modifed)	4/9/2002	Until the licence is surrendered, suspended or revoked. The licence is subject to review every three years.
Commonwealth Department of Agriculture, Water and Environment	Commonwealth Approval	EPBC 2010/5396	22/10/2010	31 December 2025.
DPE Water	Groundwater monitoring and test bore licences	Various	Various	Various.
	Water Supply Works Approval (Coal Shaft Creek diversion and various on-site water management structures)	20WA202053	1/7/2004	1 October 2028.
	Water Access Licence 41518 (for extraction of groundwater from the DCM open pits)	WAL 41518	22/09/2002	Until the licence is surrendered.

1.3 LAND OWNERSHIP AND LAND USE

The DCM is owned and operated by DCPL and is located approximately 10 km north of the village of Stroud and approximately 20 km south of Stratford in the Gloucester Valley in NSW.

The existing MLs exist wholly within land owned by Yancoal (i.e. Freehold land). Dwellings within the MLs are not occupied. Table 2 identifies the schedule of land ownership surrounding the DCM.

Table 2:
Overview of the Land Ownership and Land Use in the Land Adjacent to and Surrounding the Mine

Lot/Deposited Plan	Land Tenure	Land Ownership	Occupancy (Residential)	Leases over the Mining Lease Area (License)
1/595876	Freehold	DCPL	No	No
4/595876	Freehold	DCPL	No	No
6/876013	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
12/95773	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
19/95688	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
22/95765	Freehold	DCPL	No	No
1/1103426	Freehold	Private	N/A	N/A
1/1127503	Freehold	DCPL	No	No – offset area
1/986142	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
30/95765	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
125/95694	Freehold	DCPL	No	Rural License – restricted area, non-exclusive use
126/95695	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
130/95768	Freehold	DCPL	No	No
131/95773	Freehold	DCPL	No	No
136/95698	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
636/95742	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
705/95759	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
C/160430	Freehold	DCPL	No	Part Rural License – restricted area, non-exclusive use
Severed land resumed for public road	Freehold (MidCoast Council)			
Roads located within and between the above parcels of land	Freehold (Private subdivision road reserves or owned by MidCoast Council)			
Rail corridor located within and adjacent to the above titles	State Rail Authority of NSW			

The DCM is located within the MidCoast Local Government Area on land zoned under the *Great Lakes Local Environmental Plan* (2014) as Zone U2 (Rural Landscape).

Historic and current land use in the vicinity of the DCM is dominated by agricultural production (primarily grazing for beef production), mining and remnant vegetation generally located along ridgelines, watercourses and in isolated patches within the cleared landscape.

A number of reserved areas are located in the vicinity of the DCM, including the Myall River State Forest (located approximately 5 km to the south-east), Monkerai Nature Reserve (located approximately 7 km to the south-west), the Glen Nature Reserve (located approximately 11 km to the north-east) and Ghin-doo-ee National Park (located approximately 11 km to the east). Townships in the vicinity of the DCM site include Wards River and Stroud Road.

Long Term Biodiversity Security

In accordance with Condition 42, Schedule 3 of the Project Approval (PA 08_0203), DCPL is required to make suitable arrangements for the long-term security of the DEP Biodiversity Offset Area. DCPL used the mechanisms available under section 88E(3) of the *NSW Conveyancing Act, 1919*, namely:

- Registration of a Positive Covenant under section 88E(3) of the NSW *Conveyancing Act 1919*; and
- Registration of a Restriction on the Use of Land by a Prescribed Authority under section 88E(3) of the NSW *Conveyancing Act 1919*.

Public Positive Covenants and Restrictions on the Use of Land for the Biodiversity Offsets have been registered on title with NSW Land and Property Information in May 2015.

Biodiversity Conservation Bond

In accordance with Condition 44, Schedule 3 of the Project Approval (PA 08_0203), DCPL is required to lodge a Conservation Bond with DPE which covers the cost of implementing the Biodiversity Offset Strategy detailed in the DCM Biodiversity Management Plan (BMP).

The conservation bond for the Biodiversity Offset areas was calculated by Greening Australia and verified by Rider Levett Bucknell in December 2013 (Greening Australia, 2013). The terms of the conservation bond in the form of a Bank Guarantee were approved by DPE on 12 December 2013. The Bank Guarantee has been subsequently provided to DPE.

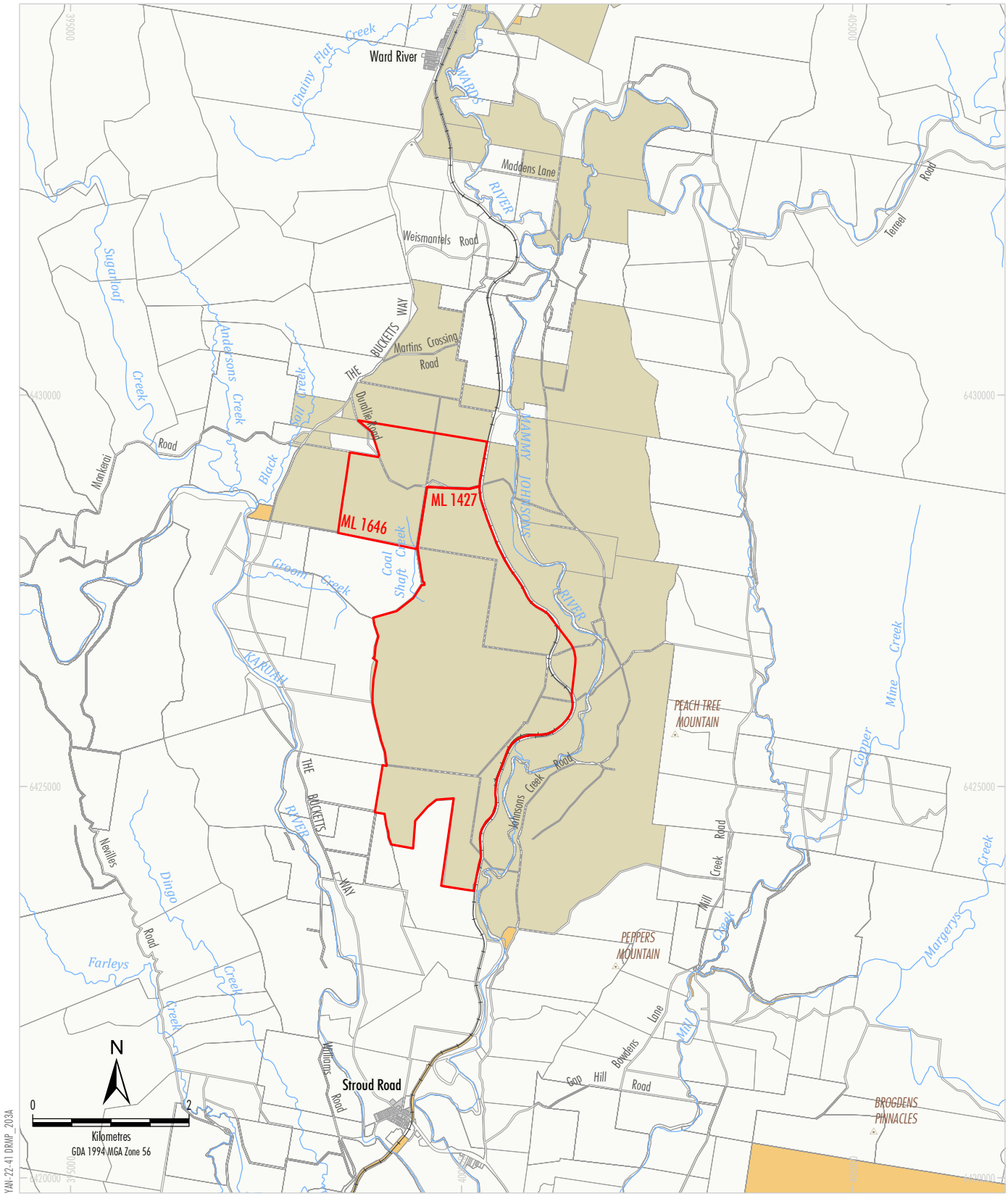
In December 2020, an Independent Environmental Audit of the DCM was undertaken in accordance with the Project Approval (PA 08_0203). A revision of the BMP was approved in January 2019 in accordance with Condition 4, Schedule 5 of the Project Approval (PA 08_0203). Following this, a revision of the conservation bond will be prepared and lodged with DPE in accordance with Condition 45, Schedule 3 of the Project Approval (PA 08_0203).

1.3.1 Land Ownership and Land Use Figure

The DCM regional location is shown in Figure 1. The general arrangement of the DCM, including MLs granted under the NSW *Mining Act 1992*, main roads, railways and public infrastructure is provided in Figure 2.

Land Ownership

Table 2 identifies the schedule of land ownership surrounding the DCM. This is depicted graphically on Figure 3.



YAN-22-41 DRNP_203A

LEGEND

- Coal - Current Title
- Yancoal - Owned Land
- Private Landholders
- Crown Land
- Urban Dvelopment

Source: © NSW Spatial Services (2020)

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Land Ownership

Figure 3

Land Use

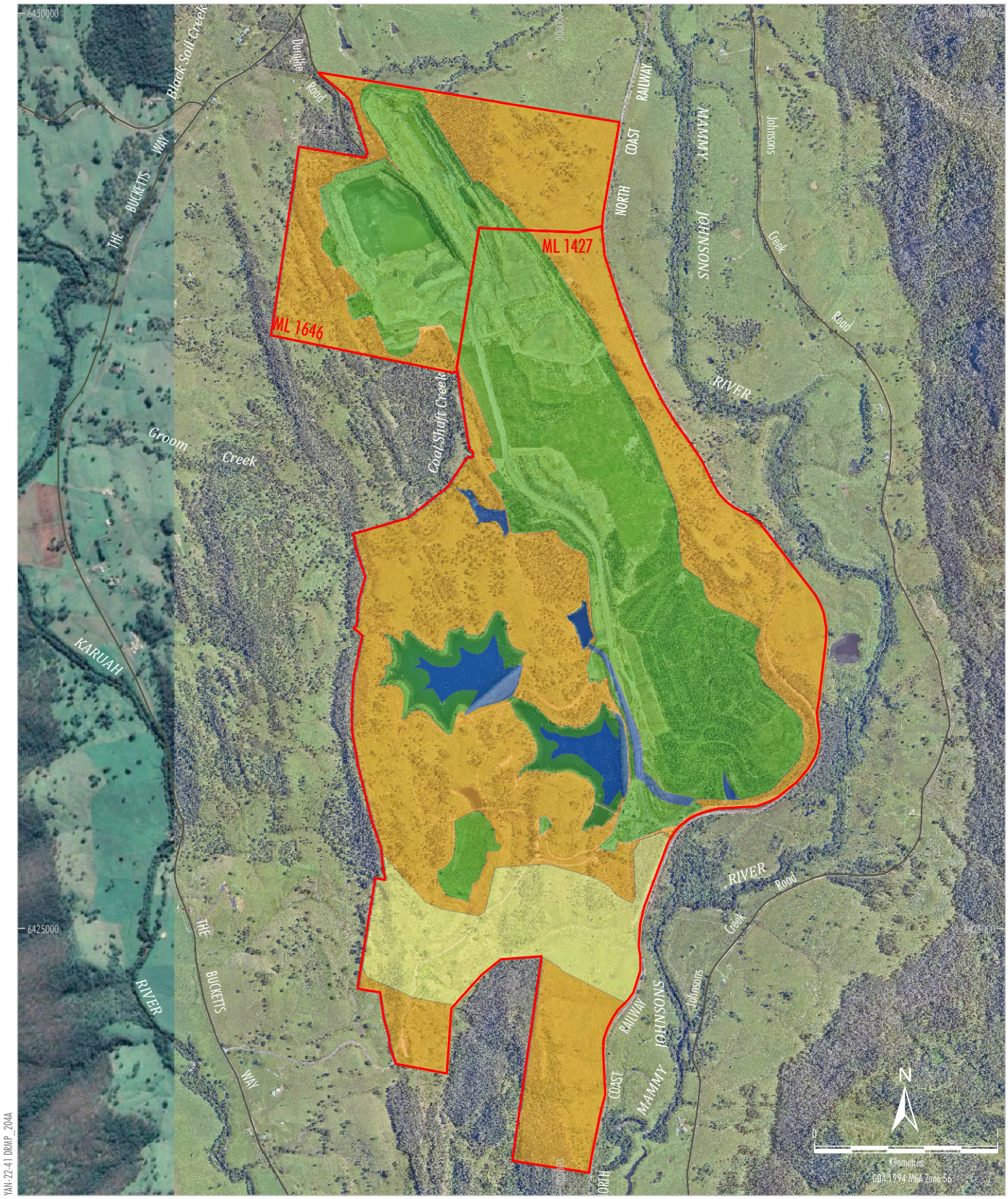
The current land uses are depicted graphically on Figure 4. As described in Section 1.1.2, mining operations were carried at the DCM until 31 December 2021 in accordance with Condition 5, Schedule 2 of Project Approval (08_0203). Accordingly, DCPL has commenced the mine closure phase. Land use at the DCM no longer encompasses active mining and, subsequently, has been categorised as active rehabilitation (Figure 4). Other land uses within MLs 1427 and 1646 at the DCM have been retained as cattle grazing sites and habitat for native flora and fauna (Figure 4).

Vegetation Communities

The vegetation communities within and surrounding the DCM are depicted in Figure 5 and is based on the vegetation mapping for the DCM environmental assessments. Vegetation mapping is also shown for the DCM Offset Areas, which incorporate the offsets for the DEP and Bowens Road North Offset Strategy. The area conserved is large (721.5 ha) and retains extensive examples of a diversity of dry and wet forest types with a relatively intact understorey. Vegetation communities present within the DCM Offset Areas are depicted on Figure 5.

Areas of Sensitivity

Areas of sensitivity at the DCM including identified heritage sites and protected biodiversity areas are depicted in Figure 6. The DCM Heritage Management Plan (HMP) considers the impacts of the development of the DCM on Aboriginal and European cultural heritage sites. Aboriginal and European cultural heritage sites in the vicinity of the DCM are depicted on Figure 6.



YAN-22-41 DKNP_204A

LEGEND

- Coal - Current Title
- Disturbance and Active Rehabilitation
- Agricultural and Rural Areas
- Biodiversity Offset Areas
- Water Management Area

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

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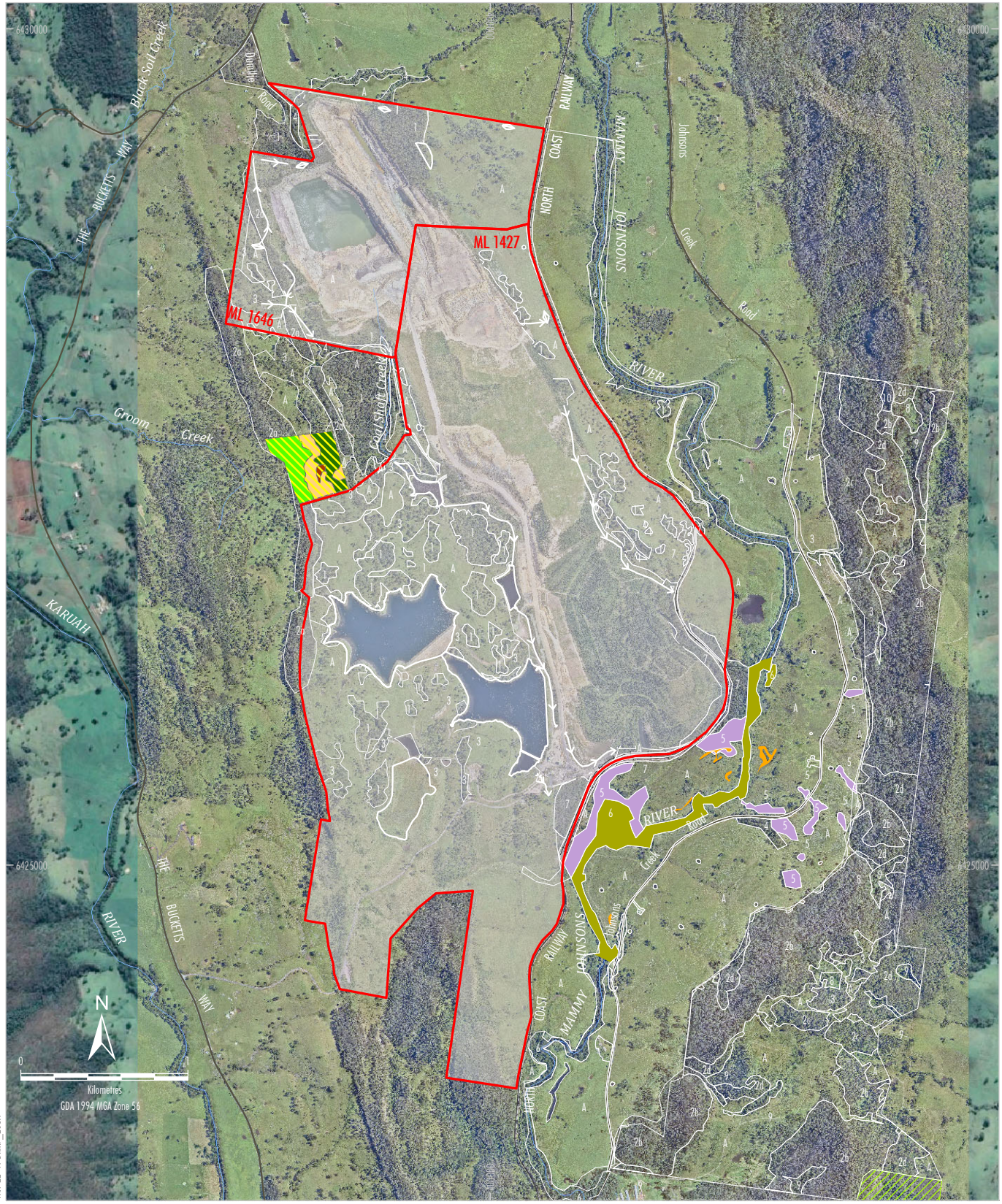
Land Use

Figure 4



LEGEND

Coal - Current Title

2014 Plant Community Type

Spotted Gum - Grey Ironbark Open Forest

Grey Box - Forest Red Gum - Grey Ironbark Open Forest

2014 Vegetation Map Units

Derived Grassland

Acacia Regeneration

2009 Vegetation Communities

1 Spotted Gum - Red Ironbark - Thick-leaved Mahogany Forest

2a-2d Spotted Gum – Grey Ironbark – Thick-leaved Mahogany Forest

3 Red Gum Grassy Woodland

4 Grey Gum – Red Gum – Apple Riparian Forest

5 Cabbage Gum Floodplain Forest - River-flat Eucalypt Forest on Coastal Floodplains Endangered Ecological Community

6 Riparian Closed Forest - Lowland Forest on Floodplain Endangered Ecological Community

7 Stringybark – Paperbark Forest

8 Dry Gully Rainforest

9 Blue Gum Moist Forest

10 Perch Sedgeland

11 Freshwater Wetlands Endangered Ecological Community

2009 Vegetation Map Units

A Derived Grasslands

B Cropping

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

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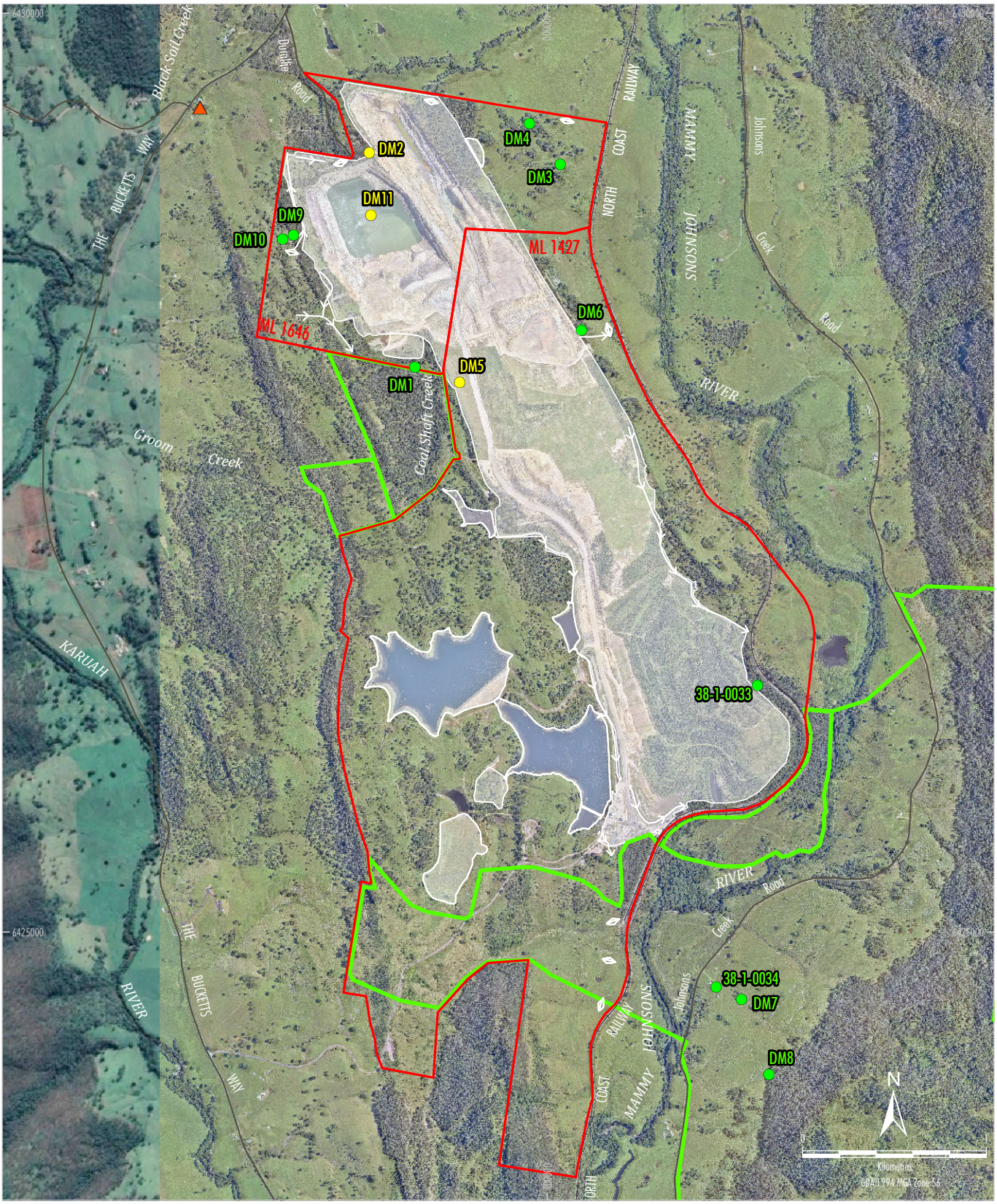
Vegetation Community Boundaries

Figure 5



YAN-22-41 DRNP_206A

LEGEND

- Coal - Current Title
- Offset Area
- Aboriginal Heritage Site
- Salvaged Aboriginal Heritage Site
- Non-Aboriginal Heritage Site

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

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Areas of Sensitivity

Figure 6

2 FINAL LAND USE

2.1 REGULATORY REQUIREMENTS FOR REHABILITATION

Table 3 details the conditions of the Project Approval (PA 08_0203) and MLs 1427 and 1646 relevant to rehabilitation at the DCM. Table 3 also lists the timing to meet each rehabilitation requirement and provides the section where each condition has been addressed in the RMP.

Table 3:
Regulatory Requirements Relating to Post-mining Land Use and Rehabilitation

<table>
<tr><th>Condition</th><th>Requirement</th><th>Relevant RMP Section</th></tr>
<tr><td colspan="3">PA 08_0203</td></tr>
<tr><td>Condition 55, Schedule 3</td><td>The Proponent shall rehabilitate the site to the satisfaction of the Secretary of DTIRIS. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA (and depicted conceptually in the figures in Appendix 7), and comply with the objectives in Table 12.
Table 12: Rehabilitation Objectives
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>Mine site (as a whole of the disturbed lane and water)</td><td>Safe, stable & non-polluting, fit for the purpose of the intended post-mining land use(s).</td></tr>
<tr><td>Surface Infrastructure</td><td>To be decommissioned and removed, unless the Secretary agrees otherwise.</td></tr>
<tr><td>Coal Shaft Creek Diversion</td><td>Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining.</td></tr>
<tr><td>Landforms</td><td>Final landforms sustain the intended land use for the post-mining domain(s).
Final landforms are consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post-mining landscape.
Final landforms incorporate design relief patterns and principles for consistent with natural drainage.</td></tr>
<tr><td>Other land affected by the project</td><td>Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of:
• local native plant species; and
• a landform consistent with the surrounding environment.</td></tr>
</table></td><td>Section 4.1</td></tr>
</table>

Table 3 (Continued):
Regulatory Requirements Relating to Post-mining Land Use and Rehabilitation

<table>
<tr><th>Condition</th><th>Requirement</th><th>Relevant RMP Section</th></tr>
<tr><td colspan="3">PA 08_0203 (Continued)</td></tr>
<tr><td>Condition 55, Schedule 3 (Continued)</td><td>Table 12 [Continued]: Rehabilitation Objectives
<table>
<tr><td>Feature</td><td>Objective</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).
Water discharged from site is consistent with the baseline ecological, hydrological and geomorphic conditions of the creeks prior to mining disturbance. Water management is consistent with the regional catchment management strategy.</td></tr>
<tr><td>Native flora and fauna habitat and corridors</td><td>Size, locations and species of native tree lots and corridors are established to sustain biodiversity habitats. Species are selected that re-establishes and complements regional and local biodiversity.</td></tr>
<tr><td>Final void</td><td>Safe, stable and non-polluting</td></tr>
<tr><td>Post-mining agricultural pursuits</td><td>The land capability classification for the relevant nominated agricultural pursuit for each domain is established and self-sustaining within 5 years of land use establishment (first planting of vegetation).</td></tr>
<tr><td>Community</td><td>Minimise the adverse socio-economic effects associated with mine closure.</td></tr>
</table></td><td>As above</td></tr>
<tr><td>Condition 56, Schedule 3</td><td>The Proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.</td><td>Section 6.1</td></tr>
<tr><td>Condition 57, Schedule 3</td><td>The Proponent shall prepare and implement a Rehabilitation Management Plan for the project to the satisfaction of the Secretary of DTIRIS. This plan must:
(a) be prepared in consultation with the Department, OEH, NOW, Council and the CCC;
(b) be prepared in accordance with any relevant DRE guideline;
(c) build, to the maximum extent practicable, on the other management plans required under this approval;
(c1) address all aspects of mine closure and rehabilitation, including post-mining land use domains, rehabilitation objectives, completion criteria and rehabilitation monitoring and management;
(d) provide for scientific knowledge gained during the rehabilitation, to be made publicly available;
(e) be submitted to the Secretary of DTIRIS for approval within 3 months of the date of this approval, unless otherwise agreed by the Secretary.</td><td>This RMP</td></tr>
<tr><td colspan="3">ML 1427 and 1646</td></tr>
<tr><td>Condition 4, Schedule 8A</td><td>Must prevent or minimise harm to environment
(1) The holder of a mining lease must take all reasonable measures to prevent, or if that is not reasonably practicable, to minimise, harm to the environment caused by activities under the mining lease.
(2) In this clause –
harm to the environment has the same meaning as in the Protection of the Environment Operations Act 1997.</td><td>This RMP</td></tr>
</table>

Table 3 (Continued):
Regulatory Requirements Relating to Post-mining Land Use and Rehabilitation

Condition	Requirements	Section Reference
ML 1427 and 1646 (Continued)		
Condition 5, Schedule 8A	***Rehabilitation to occur as soon as reasonably practicable after disturbance*** *The holder of a mining lease must rehabilitate land and water in the mining area that is disturbed by activities under the mining lease as soon as reasonably practicable after the disturbance occurs.*	Section 6.2
Condition 6, Schedule 8A	***Rehabilitation must achieve final land use*** *(1) The holder of a mining lease must ensure that rehabilitation of the mining area achieves the final land use for the mining area.* *(2) The holder of the mining lease must ensure any planning approval has been obtained that is necessary to enable the holder to comply with subclause (1).* *(3) The holder of the mining lease must identify and record any reasonably foreseeable hazard that presents a risk to the holder's ability to comply with subclause (1).* ***Note –** Clause 7 requires a rehabilitation risk assessment to be conducted whenever a hazard is identified under this subclause.* *(4) In this clause –* ***final land use** for the mining area means the final landform and land uses to be achieved for the mining area –* *(a) as set out in the rehabilitation objectives statement and rehabilitation completion criteria statement, and* *(b) for a large mine – as spatially depicted in the final landform and rehabilitation plan, and* *(c) if the final land use for the mining area is required by a condition of development consent for activities under the mining lease – as stated in the condition.* *p**lanning approval** means –* (a) *a development consent within the meaning of the Environmental Planning and Assessment Act 1979, or* *(b) an approval under that Act, Division 5.1.*	 Section 4 Section 2.1 Section 3
Condition 7, Schedule 8A	***Rehabilitation risk assessment*** (1) *The holder of a mining lease must conduct a risk assessment (a **rehabilitation risk assessment**) that –* *(a) Identifies, assesses and evaluates the risks that need to be addressed to achieve the following in relation to the mining lease –* *(i) the rehabilitation objectives,* *(ii) the rehabilitation completion criteria,* *(iii) for large mines – the final land use as spatially depicted in the final landform and rehabilitation plan, and* *(b) identifies the measures that need to be implemented to eliminate, minimise or mitigate the risks.* *(2) The holder of a mining lease must implement the measures identified.* (3) *The holder of a mining lease must conduct a rehabilitation risk assessment –* *(a) for a large mine – before preparing a rehabilitation plan, and* *(b) for a small mine – before preparing the rehabilitation outcome documents for the mine, and*	Section 3 Section 3 Section 3

Table 3 (Continued):
Regulatory Requirements Relating to Post-mining Land Use and Rehabilitation

Condition	Requirements	Section Reference
ML 1427 and 1646 (Continued)		
Condition 7, Schedule 8A (Continued)	*(c) whenever a hazard is identified under clause 6(3) – as soon as reasonably practicable after it is identified, and* *(d) whenever given a written direction to do so by the Secretary.*	
Condition 10, Schedule 8A	***Rehabilitation management plans for large mines*** (1) *The holder of a mining lease relating to a large mine must prepare a plan (a **rehabilitation management plan**) for the mining lease that includes the following –* *(a) a description of how the holder proposes to manage all aspects of the rehabilitation of the mining area,* *(b) a description of the steps and actions the holder proposes to take to comply with the conditions of the mining lease that relate to rehabilitation,* *(c) a summary of rehabilitation risk assessments conducted by the holder,* *(d) the risk control measures identified in the rehabilitation risk assessments,* *(e) the rehabilitation outcome documents for the mining lease,* *(f) a statement of the performance outcomes for the matters addressed by the rehabilitation outcome documents and the ways in which those outcomes are to be measured and monitored.* *(2) If a rehabilitation outcome document has not been approved by the Secretary, the holder of the mining lese must include a proposed version of the document.* *(3) A rehabilitation management plan is not required to be given to the Secretary for approval.* *(4) The holder of the mining lease –* *(a) must implement the matters set out in the rehabilitation management plan, and* *(b) if the forward program specifies timeframes for the implementation of the matters – must implement the matters within those timeframes.*	This RMP Section 6.2 Section 5 Section 3 Section 3 Sections 4 and 5 Section 4 Sections 4 and 5 N/A
Condition 12, Schedule 8A	***Rehabilitation outcome documents*** (1) *The holder of a mining lease must prepare the following documents (the **rehabilitation outcome documents**) for the mining lease and give them to the Secretary for approval –* (a) *the **rehabilitation objectives statement**, which sets out the rehabilitation objectives required to achieve the final land use for the mining area,* (b) *the **rehabilitation completion criteria statement**, which sets out criteria, the completion of which will demonstrate the achievement of the rehabilitation objectives,* (c) *for a large mine, the **final landform and rehabilitation plan**, showing a spatial depiction of the final land use.* *(2) If the final land use for the mining area is required by a condition of development consent for activities under the mining lease, the holder of the mining lease must ensure the rehabilitation outcome documents are consistent with that condition.*	Section 4 Section 4 Section 5

2.2 FINAL LAND USE OPTIONS ASSESSMENT

The conceptual final land use for the DCM has been assessed and is detailed in DCM's Environmental Assessment (EA) (DCPL, 2014) and Condition 55, Schedule 3 of the Project Approval (PA 08_0203). Approved final land uses at the DCM include:

- agricultural (grazing);
- native ecosystem;
- water management areas;
- water storage areas (excluding final voids); and
- final void.

2.3 FINAL LAND USE STATEMENT

The proposed final landform and final land use are depicted spatially in Section 5 of this RMP. This is generally in accordance with the conceptual final landform detailed in DCM's EA (DCPL, 2014) and the Project Approval (PA 08_0203). The final land uses are consistent with those described in Section 2.2.

As required by Condition 55, Schedule 3 of the Project Approval (PA 08_0203), the final land use and rehabilitation objectives outlined in Section 4.1 are generally in accordance with the final landform proposed in the DCM's EA (DCPL, 2014) and associated documentation.

2.4 FINAL LAND USE AND MINING DOMAINS

2.4.1 Final Land Use Domains

Final land use domains are land management units characterised by a similar post-mining land use objective. Consistent with contemporary rehabilitation guidelines and rehabilitation planning best practice, final land use domains have been developed for the DCM. In accordance with the approved Final Landform and Rehabilitation Plan (FLRP) outlined in Section 5 of this RMP, the final land use domains at the DCM are:

- agricultural (grazing);
- native ecosystem;
- water management areas;
- water storage (excluding final voids); and
- final void.

The codes associated with the DCM Final Land Use Domains are presented in Table 4.

Table 4
DCM Mining and Final Land Use Domains

Code	Mining Domain	Code	Final Land Use Domain
1	Infrastructure Area	A	Native Ecosystem
3	Water Management Area	B	Agriculture – Grazing
4	Overburden Emplacement Area	F	Water Management Areas
5	Active Mining Area (open cut void)	G	Water Storage (Excluding Final Void)
		J	Final Void

2.4.2 Mining Domains

Mining domains refer to the footprint of areas disturbed for discrete mining-related activities. As described in Section 1, mining operations at the DCM ceased on 31 December 2021. Mining domains at the DCM consist of:

- infrastructure areas (i.e. administration facilities, coal handling infrastructure, maintenance facilities and access roads);
- water management areas (e.g. the Coal Shaft Creek Diversion, mine water dams);
- overburden emplacement areas; and
- open cut voids (i.e. Weismantel Open Pit and Clareval Open Pit).

Mining domains at the DCM have been delineated based on operational or functional purpose and therefore are defined by their geophysical characteristics. The codes associated with the DCM Mining Domains are presented in Table 4.

3 REHABILITATION RISK ASSESSMENT

DCPL has successfully undertaken rehabilitation activities at the DCM since 2008 with results of rehabilitation monitoring continuing to inform the effectiveness of rehabilitation methods and requirements for contingency measures.

The Duralie Extension Project EA included an Environmental Risk Assessment (ERA) which identified environmental and rehabilitation risks relevant to the DCM (SP Solutions, 2009). The ERA was prepared in accordance with the Australian Standard/New Zealand Standard (AS/NZS) 4360:2004 *Risk Management*, Standards Australia Handbook 203:2006 *Environmental Risk Management – Principles and Process* and *MDG1010 Risk Management Handbook for the Mining Industry* (Department of Primary Industries [DPI], 1997).

An ERA workshop was conducted on 22 october 2009 to identify key issues for the DCM. The following issues were assigned a risk greater than low:

- Noise and blasting impacts exceed criteria at nearby receivers consistent with predictions.
- Loss of flora and fauna habitat resulting from approved clearance of vegetation.
- Dust emissions exceed criteria at nearby receivers in accordance with predictions.
- Visual impacts on The Bucketts Way and nearby receivers to the north of the DCM.

The relevant environmental impacts relating to the above issues have been assessed in the DEP EA and the 2014 Modification EA. The relevant mitigation and management measures for each risk identified in the EA are described in the DCM Environmental Management Strategy and associated environmental management plans.

A Mine Closure ERA (HMS Consultants Australia Pty. Ltd [HMS], 2017) for the DCM was undertaken on 22 November 2017 to review the 2009 ERA findings, to review and update the DCM Environmental Risk Register for the mine closure and rehabilitation stage of operations and to provide guidance for the DCM Mine Closure Plan and Schedule (Appendix 1). The risk assessment was undertaken in accordance with the AS/NZS ISO 31000:2009 *Risk management – Principles and guidelines* and the Yancoal Risk Assessment Standard Consequences Matrix.

Further, the *Duralie Coal Mine: Closure & Rehabilitation Risk Assessment: Summary of Key Risks and Controls* was prepared by Integrated Environmental Management Australia (IEMA) (2021) for the DCM. The risk assessment workshop was held over two days from 16 to 17 August 2021. Where appropriate, the outcomes from the earlier risk assessments were considered in more detail to inform the detailed closure planning. The workshop comprised of seven individual sessions that assessed key risks associated with closure activities, including:

- Life of Mine Plan and General Closure Risks;
- Decommissioning and Demolition;
- Growth Media Suitability, Establishment, Rehabilitation Materials and Biological Resources;
- Final Landform Design and Establishment;
- Ecosystem Establishment;
- Ecosystem Sustainability and Rehabilitation Completion; and
- Other management aspects.

A summary of the key risks identified at the DCM from the 2021 *Closure & Rehabilitation Risk Assessment* (IEMA, 2021) include:

- Less than adequate Community Engagement which results in loss of reputation or loss of goods and services.
- Less than adequate assessment and mitigation of the social impacts relating to closure of the mine(s).
- Less than adequate Human Resource Strategy (redundancy/retention/redeployment).
- Uncertainty around what our closure criteria are for the site.
- Poor Record and Document Management systems for closure.
- Delay in relinquishment or retention of licenses and consent conditions (project approvals, EPL, radiation, etc.)
- Less than adequate understanding of the potentially acid forming (PAF)/ non-acid forming (NAF) materials balance to achieve suitable rehabilitation outcomes.
- Poor stockpiling of topsoil and handling has resulted in loss or impact on the physical properties of the soil.
- The approved Final Void (location and profile) are not able to be achieved and relinquished.
- Less than adequate design of final proposed highwalls (and low walls) for the final voids.
- Less than adequate post mining groundwater recovery model or the model relies on poor assumptions.
- Less than adequate understanding of the final void(s) water quality and whether the voids will fill and spill.
- Less than adequate landform design parameters consistent with the approved final landform.
- Geotechnical stability of the final landform cannot be achieved.
- Surface water infrastructures fails or results in long term maintenance requirements.
- The methodologies used to apply seed or plant tube stick is not appropriate and results in failure to achieve the preferred rehab outcome.

For each of the key rehabilitation and mine closure risks identified, appropriate risk reduction strategies/actions were developed to adequately control the risk. Critical controls and actions for the risks listed above are provided in Attachment A.

This RMP addresses risks related to closure planning and the associated risk reduction strategies through incorporation of the DCM Mine Closure Plan and Schedule (Appendix 1). The findings of the 2021 *Closure & Rehabilitation Risk Assessment* summarised above will continue to inform the technical and Eas required by the DCM Mine Closure Plan and Schedule. The technical and Eas undertaken and strategies developed as part of the DCM Mine Closure Plan and Schedule have been incorporated into the trigger, action, response plan (TARP) outlined in Section 10.

A copy of the *Closure & Rehabilitation Risk Assessment* conducted by IEMA (2021) is provided in Attachment A.

4 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The mine closure goal for the DCM is to achieve relinquishment to the satisfaction of the relevant Minister(s), meeting relevant ML and Project Approval conditions. Rehabilitation of mined lands will be considered suitable when the nominated standards and/or completion criteria have been met, or if the relevant Minister(s) otherwise accepts the rehabilitation status.

The key completion criteria for the DCM (Table 5) are designed to address rehabilitation objectives and incorporate outcomes from the assessment of completed rehabilitation in all final land use domains. Rehabilitation will need to achieve a standard which satisfies the NSW Resources Regulator that DCPL has met rehabilitation undertakings provided in this RMP and rehabilitation bonds can be released.

Table 5:
Key Completion Criteria

Component	Key Completion Criteria
Mine Site (as a whole of the disturbed land and water)	• Safe, stable & non-polluting, fit for the purpose of sustaining the intended post-mining land use(s).
Infrastructure	• All infrastructure has been decommissioned and removed, unless justification has been provided for retention in the post-mining land use.
Coal Shaft Creek Reconstruction	• Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining. • Drainage channel which generally replicates the original meandering geometry of Coal Shaft Creek.
Final Landforms	• Safe, stable, adequately drained post-mining landforms, which are visually consistent with the surrounding landscape. • Geomorphic stability of drainage features comparable to existing natural drainage features.
Final Voids	• Appropriate security measures implemented to ensure final voids do not pose a risk to public safety. • Final void landforms established to minimise the overall size and depth and confirmed to be safe and stable. • Final voids are sinks or flow through for the local groundwater system as confirmed by predictive post-mining groundwater model. • Water quality in any approved final voids does not pose a risk to the final land use, any receiving ecosystems, or cause impacts to privately owned properties. • The risk of flood interaction for all flood events is negligible.
Native Ecosystem Rehabilitation and Biodiversity Corridors	• Ecosystem function restored, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species and consistent with the surrounding environment. • Native ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function equivalent to unmined reference sites of remnant vegetation.
Agricultural Rehabilitation	• The land capability and agricultural suitability classification for the relevant nominated agricultural pursuit for each domain is established.
Water Management and Quality	• Retained water infrastructure is stable, safe and operating effectively. • Water retained on-site is fit for the intended post-mining land use(s). • Water discharged from site is consistent with the baseline ecological, hydrological and geomorphic conditions of the creeks prior to mining disturbance.
Community	• Socio-economic effects associated with mine closure has been minimised.

4.1 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

The overall objective for the final rehabilitated landform is to establish a safe, stable and non-polluting landform that is compatible with the surrounding landscape and fit for sustaining the intended post-mining land use. In accordance with Condition 55, Schedule 3 of the Project Approval (PA 08_0203), detailed domain rehabilitation objectives are further outlined in Table 6.

The rehabilitation objectives are considered to be broader objectives that cover specific aspects of rehabilitation. To complement these objectives, DCPL has developed performance indicators and completion criteria for each domain and rehabilitation phase based on the SMART principle. The objectives, indicators and completion criteria for each of the final land use and mining domains during the rehabilitation phases are specified in Table 6.

In accordance with Clause 12, Schedule 8A of the *Mining Regulation 2016*, the NSW Resources Regulator has approved the DCM Rehabilitation Objectives Statement. This RMP has been amended to substitute the proposed rehabilitation objectives with the approved rehabilitation objectives (Table 6) in accordance with Clause 11, Schedule 8A of the *Mining Regulation 2016*. Following submission of the rehabilitation completion criteria to the NSW Resources Regulator, this RMP will be further amended to substitute the proposed version (Table 6) with the version approved by the NSW Resources Regulator.

The approved rehabilitation objectives, proposed indicators and proposed rehabilitation completion criteria for each of the final land use and mining domains during the rehabilitation phases are specified in Table 6.

Table 6:
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
Domain A Native Ecosystem	**Domain 1** Infrastructure Area	A1	Removal of Infrastructure	All infrastructure, including water management and rejects management infrastructure, that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials, unless justification has been provided for retention in the post-mining land use. Retention of water management infrastructure for post-mining use as agreed with relevant agencies and landholders.	Relevant infrastructure decommissioned and removed (as agreed via consultation).	Complete removal of relevant infrastructure.	• Infrastructure decommissioning & demolition Strategy. • ITP – Decommissioning. • Visual monitoring and reporting.
		A1	Removal of Infrastructure	Coal Shaft Creek Diversion decommissioned in accordance with the DCM Water Management Plan. (To be replaced by the CSC Reconstruction).	Decommissioning of Coal Shaft Creek Diversion undertaken.	Decommissioning of Coal Shaft Creek Diversion completed in accordance with the DCM Water Management Plan.	Visual monitoring and decommissioning report.
		A1	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997*.	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment. • Requirements of the NSW Contaminated Land Management Act 1997 (which references soil quality criteria [e.g. pH]).
		A1	Landform stability	Final landforms reshaped to incorporate design relief patterns and principles consistent with natural drainage.	Landforms are free draining.	Adequately drained final landforms consistent with the surrounding landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring and final landform topographic survey.
		A1	Landform stability	Creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements and all other rehabilitated domains.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	As above	As above	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
						Landform erosion modelling demonstrates landforms are long-term stable.	
						Waste emplacements constructed in accordance with approved design as evidenced by survey.	
						Gradient for waste emplacement slopes no greater than approximately 1 V:4 H.	
						Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %.	
						No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	
		A1	Landform stability	Creation of landforms which are visually consistent with the surrounding environment.	Elevation of waste emplacements constructed in accordance with approved design.	Post-mining landforms consistent with the surrounding landscape. Waste emplacements constructed in accordance with approved design and Project Approval commitments.	• ITP – Landform Establishment. • Topographic survey of final landform. • Photographic monitoring of rehabilitated landforms.
		A1	Ecological rehabilitation	Levels of native ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	Ecosystem Function Analysis (EFA) indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation composition of the Native Ecosystem rehabilitation areas contains species that are commensurate with unmined reference sites of remnant vegetation in the local area.	Ecosystem Function Analysis indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation structure of the Native Ecosystem rehabilitation areas is on a path towards obtaining comparable flora values with unmined reference sites of remnant vegetation in the local area.	Ecosystem Function Analysis indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native Ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	A1	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.
		A1	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*.
Domain A Native Ecosystem	**Domain 3** Water Management Area	A3	Removal of Infrastructure	All infrastructure, including water management and rejects management infrastructure, that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials, unless justification has been provided for retention in the post-mining land use. Retention of water management infrastructure for post-mining use as agreed with relevant agencies and landholders.	Relevant infrastructure decommissioned and removed (as agreed via consultation).	Complete removal of relevant infrastructure.	• Infrastructure Decommissioning & Demolition Strategy. • Inspection and Test Plan (ITP) - Decommissioning. • Visual monitoring and reporting.
		A3	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997*.	Contaminated soils and sediments removed and remediation completed.	Contaminated Lands Assessment. Requirements of the NSW *Contaminated Land Management Act 1997* (which references soil quality criteria [e.g. pH]).
		A3	Landform stability	Final landforms reshaped to incorporate design relief patterns and principles consistent with natural drainage.	Landforms are free draining.	Adequately drained final landforms consistent with the surrounding landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring and final landform topographic survey.
		A3	Landform stability	Creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements and all other rehabilitated domains.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	As above	As above	The final landform is stable for the long-term and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Adequately drained final landforms consistent with the surrounding landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
						Safe and stable landform. No evidence of active erosion.	
						Landform erosion modelling demonstrates landforms are long-term stable.	
						Waste emplacements constructed in accordance with approved design as evidenced by survey.	
						Gradient for waste emplacement slopes no greater than approximately 1 V:4 H.	
						Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %.	
						No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	
		A3	Landform stability	Creation of landforms which are visually consistent with the surrounding environment.	Elevation of waste emplacements constructed in accordance with approved design.	Post-mining landforms consistent with the surrounding landscape. Waste emplacements constructed in accordance with approved design and Project Approval commitments	• ITP – Landform Establishment. • Topographic survey of final landform. • Photographic monitoring of rehabilitated landforms.
		A3	Ecological rehabilitation	Levels of native ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation composition of the Native Ecosystem rehabilitation areas contains species that are commensurate with unmined reference sites of remnant vegetation in the local area.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation structure of the Native Ecosystem rehabilitation areas is on a path towards obtaining comparable flora values with unmined reference sites of remnant vegetation in the local area.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native Ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	A3	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.
		A3	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
Domain A Native Ecosystem	**Domain 4** Overburden Emplacement Area	A4	Removal of Infrastructure	All infrastructure, including water management and rejects management infrastructure, that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials, unless justification has been provided for retention in the post-mining land use. Retention of water management infrastructure for post-mining use as agreed with relevant agencies and landholders.	Relevant infrastructure decommissioned and removed (as agreed via consultation).	Complete removal of relevant infrastructure.	• Infrastructure decommissioning & demolition Strategy. • ITP – Decommissioning. • Visual monitoring and reporting.
		A4	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997*.	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment. • Requirements of the NSW Contaminated Land Management Act 1997 (which references soil quality criteria [e.g. pH]).
		A4	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 land use.	Presence of spontaneous combustion or heating of PAF material.	No areas of spontaneous combustion identified or heating of PAF material.	• ITP – PAF and Spontaneous Combustion Management. • Monitoring and assessment of spontaneous combustion in the final landform.
				Rehabilitated waste emplacements do not generate any material acid leachate/drainage.	Suitable pH levels recorded in surrounding groundwater/surface water, as per the monitoring program described in the Water Management Plan.	No evidence of acid mine drainage indicated by adverse pH levels recorded in surrounding surface/groundwater systems.	• ITP – PAF and Spontaneous Combustion Management. • Groundwater and surface water monitoring as per the DCM Water Management plan
				In-pit PAF material is stored appropriately below the predicted post-mining groundwater table and is non-polluting	PAF material is placed below the predicted post-mining groundwater table.	Survey confirms as PAF material is placed below the predicted post-mining groundwater table.	• ITP – PAF and Spon Comm Management. • Survey of placement of PAF materials.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	A4	Landform stability	Final landforms reshaped to incorporate design relief patterns and principles consistent with natural drainage.	Landforms are free draining.	Adequately drained final landforms consistent with the surrounding landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring and final landform topographic survey.
		A4	Landform stability	Creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements and all other rehabilitated domains.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
As above	As above	A4	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		A4	Landform stability	Creation of landforms which are visually consistent with the surrounding environment.	Elevation of waste emplacements constructed in accordance with approved design.	Post-mining landforms consistent with the surrounding landscape. Waste emplacements constructed in accordance with approved design and Project Approval commitments.	• ITP – Landform Establishment. • Topographic survey of final landform. • Photographic monitoring of rehabilitated landforms.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	A4	Ecological rehabilitation	Levels of native ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation composition of the Native Ecosystem rehabilitation areas contains species that are commensurate with unmined reference sites of remnant vegetation in the local area.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
				The vegetation structure of the Native Ecosystem rehabilitation areas is on a path towards obtaining comparable flora values with unmined reference sites of remnant vegetation in the local area.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Native Ecosystem areas on trajectory towards self-sustaining ecosystem and/or measures of ecosystem function (e.g. EFA indices) equivalent to unmined reference sites of remnant vegetation.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
		A4	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.
		A4	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
Domain B Agriculture – Grazing	**Domain 3** Water Management Area	B3	Removal of Infrastructure	All infrastructure, including water management and rejects management infrastructure, that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials, unless justification has been provided for retention in the post-mining land use. Retention of water management infrastructure for post-mining use as agreed with relevant agencies and landholders.	Relevant infrastructure decommissioned and removed (as agreed via consultation).	Complete removal of relevant infrastructure.	• Infrastructure Decommissioning & Demolition Strategy. • Inspection and Test Plan (ITP) - Decommissioning. • Visual monitoring and reporting.
		B3	Removal of Infrastructure	Auxiliary Dam No. 1 dewatered and decommissioned in accordance with Mine Water Dam Decommissioning Strategy and in consultation with Dam Safety NSW.	Decommissioning of Auxiliary Dam No. 1 undertaken as per Mine Water Dam Decommissioning Strategy.	Decommissioning of Auxiliary Dam No. 1 completed in accordance with Mine Water Dam Decommissioning Strategy. Auxiliary Dam No. 1 removed from Dam Safety NSW Declared dam register.	• Engineer's dams decommissioning report. • Dam Safety NSW Signoff. • Visual monitoring.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	B3	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997.*	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment • Requirements of the NSW *Contaminated Land Management Act 1997* (which references soil quality criteria [e.g. pH]).
		B3	Landform stability	Final landforms reshaped to incorporate design relief patterns and principles consistent with natural drainage.	Landforms are free draining.	Adequately drained final landforms consistent with the surrounding agricultural landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring and final landform topographic survey.
		B3	Landform stability	Creation of landforms which are visually consistent with the surrounding environment.	Elevation of waste emplacements constructed in accordance with approved design.	Post-mining landforms consistent with the surrounding landscape. Waste emplacements constructed in accordance with approved design and Project Approval commitments	• ITP – Landform Establishment. • Topographic survey of final landform. • Photographic monitoring of rehabilitated landforms.
		B3	Landform stability	Creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements and all other rehabilitated domains.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 per cent (%) flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		B3	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 per cent (%) flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	B3	Agricultural revegetation	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use. Land use capability is capable of supporting the target agricultural land use.	Landscape Function Analysis (LFA) soil surface assessment indices. Land capability and agricultural suitability classification.	Pasture is developing similar to that found in the relevant reference site and self-sustaining. The land capability and agricultural suitability classification for the relevant nominated agricultural pursuit for each domain is established.	• ITP - Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • LFA Assessment. • Agronomic assessment of land capability and agricultural suitability classification.
		B3	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.
		B3	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
Domain B Agriculture – Grazing	**Domain 4** Overburden Emplacement Area	B4	Removal of Infrastructure	All infrastructure, including water management and rejects management infrastructure, that is not to be used as part of the final land use is removed to ensure the site is safe and free of hazardous materials, unless justification has been provided for retention in the post-mining land use. Retention of water management infrastructure for post-mining use as agreed with relevant agencies and landholders.	Relevant infrastructure decommissioned and removed (as agreed via consultation).	Complete removal of relevant infrastructure.	• Infrastructure Decommissioning & Demolition Strategy. • Inspection and Test Plan (ITP) - Decommissioning. • Visual monitoring and reporting.
		B4	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997.*	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment • Requirements of the NSW *Contaminated Land Management Act 1997* (which references soil quality criteria [e.g. pH]).
		B4	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 land use.	Presence of spontaneous combustion or heating of PAF material.	No areas of spontaneous combustion identified or heating of PAF material.	• ITP – PAF and Spontaneous Combustion Management. • Monitoring and assessment of spontaneous combustion in the final landform.
		B4	Management of waste and process materials	Rehabilitated waste emplacements do not generate any material acid leachate/drainage.	Suitable pH levels recorded in surrounding groundwater/surface water, as per the monitoring program described in the Water Management Plan.	No evidence of acid mine drainage indicated by adverse pH levels recorded in surrounding surface/groundwater systems.	• ITP – PAF and Spontaneous Combustion Management • Groundwater and surface water monitoring as per the DCM Water Management plan.
		B4	Management of waste and process materials	In-pit PAF material is stored appropriately below the predicted post-mining groundwater table and is non-polluting	PAF material is placed below the predicted post-mining groundwater table.	Survey confirms as PAF material is placed below the predicted post-mining groundwater table.	• ITP – PAF and Spon Comm Management. • Survey of placement of PAF materials.
		B4	Landform stability	Final landforms reshaped to incorporate design relief patterns and principles consistent with natural drainage.	Landforms are free draining.	Adequately drained final landforms consistent with the surrounding agricultural landscape as evidenced by survey.	• ITP – Landform Establishment. • Visual monitoring and final landform topographic survey.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	B4	Landform stability	Creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements and all other rehabilitated domains.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		B4	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		B4	Landform stability	Creation of landforms which are visually consistent with the surrounding environment.	Elevation of waste emplacements constructed in accordance with approved design.	Post-mining landforms consistent with the surrounding landscape. Waste emplacements constructed in accordance with approved design and Project Approval commitments.	• ITP – Landform Establishment. • Topographic survey of final landform. Photographic monitoring of rehabilitated landforms.
		B4	Agricultural revegetation	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use. Land use capability is capable of supporting the target agricultural land use.	Landscape Function Analysis (LFA) soil surface assessment indices. Land capability and agricultural suitability classification.	Pasture is developing similar to that found in the relevant reference site and self-sustaining. The land capability and agricultural suitability classification for the relevant nominated agricultural pursuit for each domain is established.	• ITP - Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • LFA Assessment. Agronomic assessment of land capability and agricultural suitability classification.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	B4	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.
		B4	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
Domain F Water Management Area	**Domain 3** Water Management Area	F3	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).	Long-term stability of retained water structures. The upslope diversions have been designed to pass the peak flow generated by a 1% annual exceedance probability (AEP) rainfall event. Permanent diversion(s) including the final Coal Shaft Creek Diversion will be assessed against the probable maximum flood event. Design requirements in the DCM Water Management Plan.	Retained water infrastructure has been assessed by a qualified expert and demonstrated to be stable, safe and operating effectively.	• ITP – Decommissioning. • Refer to the post-mining water management system described in the DCM Water Management Plan. • Hydraulic and hydrologically modelling. • Surface Water Monitoring Program (Closure Phase).
		F3	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997.*	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment • Requirements of the NSW *Contaminated Land Management Act 1997* (which references soil quality criteria [e.g. pH]).
		F3	Landform stability	Coal Shaft Creek Reconstruction Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining. Drainage channel which generally replicates the original meandering geometry of Coal Shaft Creek.	As per the Coal Shaft Creek Reconstruction Plan (CSCRP), Attachment C of the SWMP: • Detailed design plans of the post-mining alignment and reconstruction of CSC informed by geotechnical, hydrological and hydraulic analyses. • Channel profile. • Channel alignment including changes to flow path geometry. • Channel slope and bank stability. • Bed and bank erosion rates. • Vegetation and habitat establishment. • Water quality.	Safe, stable and non-polluting reconstruction of Coal Shaft Creek completed consistent with the CSCRP.	• Refer to the Coal Shaft Creek Reconstruction Plan described in the DCM Water Management Plan. • As built construction report and verification by suitably qualified engineer. • Monitoring of Coal Shaft Creek.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	F3	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna. Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		F3	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community within the Water Management Area. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
		F3	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.	Hydrological and hydro-geological assessments are undertaken to determine water take at completion from the relevant water sources to confirm that sufficient allocations are held.	Adequate water allocations and associated licenses are held for all applicable structures.	Copy of any relevant approvals or evidence if approvals not required. Confirmation from relevant Government Agency (e.g. NRAR) that licences are held. Independent water harvesting compliance assessment.
		F3	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
		F3	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
Domain G Water Storage (Excluding Final Void)	**Domain 3** Water Management Area	G3	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).	Long-term stability of retained water structures. The upslope diversions have been designed to pass the peak flow generated by a 1% annual exceedance probability (AEP) rainfall event. Permanent diversion(s) including the final Coal Shaft Creek Diversion will be assessed against the probable maximum flood event. Design requirements in the DCM Water Management Plan.	Retained water infrastructure has been assessed by a qualify expert and demonstrated to be stable, safe and operating effectively.	• ITP – Decommissioning. • Refer to the post-mining water management system described in the DCM Water Management Plan. • Hydraulic and hydrologically modelling. • Surface Water Monitoring Program (Closure Phase).
				The Main Water Dam and Auxiliary Dam No. 2 would be retained for future post-mining use as water storage for agricultural (i.e. stock watering, irrigation) or other use.	Decommissioning of Main Water Dam and Auxiliary Dam No. 2 undertaken as per the Detailed Decommissioning Strategy for the DCM's declared mine water dams. Establishment of retain water body	Decommissioning of Main Water Dam and Auxiliary Dam No. 2 completed in accordance with the Detailed Decommissioning Strategy for the DCM's declared mine water dams. Main Water Dam and Auxiliary Dam No.2 removed from Dam Safety NSW Declared dam register. Retained water bodies have been established in consultation with Dam Safety NSW.	• Mine Water Dam Decommissioning Strategy. • Dams Engineer decommissioning report. • Verification in consultation with Dams Safety NSW and in accordance with the Consequence Category Assessment Methodology defined in the Declared Dams Consequence Category Assessment and Determination Methodology published in NSW Government Gazette Number 137 dated 8 November 2019.
		G3	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna. Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		G3	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.	Hydrological and hydro-geological assessments are undertaken to determine water take at completion from the relevant water sources to confirm that sufficient allocations are held.	Adequate water allocations and associated licenses are held for all applicable structures.	• Copy of any relevant approvals or evidence if approvals not required. Confirmation from relevant Government Agency (e.g. NRAR) that licences are held. Independent water harvesting compliance assessment.
		G3	Surface water	Runoff water quality from rehabilitation area is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	• Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	G3	Groundwater	Groundwater quality is similar to, or better than the pre-disturbance water quality.	The measured water quality at important groundwater assets meets predictions. Modelled drawdown and water take is consistent with approval predictions.	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the site.	• Independent hydro-geological assessment report. • Monitoring reports.
As above	As above	G3	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
		G3	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*
Domain J Final Void	**Domain 5** Active Mining Area (Open cut void)	J5	Landform stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream / downslope of the site or a safety risk to the public/stock/native fauna. Landform that is commensurate with surrounding natural landform and where appropriate, incorporates geomorphic design principles.	Slope of rehabilitated landform no greater than approximately 1V:4H. Appropriately designed berms, drains and contour banks. No evidence of active erosion.	Safe and stable landform. No evidence of active erosion. Landform erosion modelling demonstrates landforms are long-term stable. Waste emplacements constructed in accordance with approved design as evidenced by survey. Gradient for waste emplacement slopes no greater than approximately 1 V:4 H. Drainage on the outer emplacement batters facilitated via contour benches and drains with a longitudinal grade of 1 % flattening to 0.6 %. No large rocks present on waste emplacement slopes that prevent the establishment of the final land use.	• ITP – Landform Establishment. • Visual monitoring. • Landform Topographic Survey. • Landform Erosion Modelling. • Surface water quality monitoring. • Erosion and sediment control monitoring.
		J5	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 land use.	Presence of spontaneous combustion or heating of PAF material.	No areas of spontaneous combustion identified or heating of PAF material.	• ITP – PAF and Spontaneous Combustion Management. • Monitoring and assessment of spontaneous combustion in the final landform.
				Final voids do not generate any material acid leachate/drainage.	Suitable pH levels recorded in surrounding groundwater/surface water, as per the monitoring program described in the Water Management Plan	No evidence of acid mine drainage indicated by adverse pH levels recorded in surrounding surface/groundwater systems.	• ITP – PAF and Spontaneous Combustion Management. • Groundwater and surface water monitoring as per the DCM Water Management plan.
				In-pit PAF material is stored appropriately below the predicted post-mining groundwater table and is non-polluting.	PAF material is placed below the predicted post-mining groundwater table.	Survey confirms as PAF material is placed below the predicted post-mining groundwater table.	• ITP – PAF and Spontaneous Combustion Management. • Survey of placement of PAF materials.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	J5	Land contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	Presence of any contaminated soils or sediments. Contaminated soils identified and proposed remediation measures consistent with requirements of the NSW *Contaminated Land Management Act 1997.*	Contaminated soils and sediments removed and remediation completed.	• Contaminated Lands Assessment • Requirements of the NSW *Contaminated Land Management Act 1997* (which references soil quality criteria [e.g. pH]).
		J5	Landform stability	Minimise to the greatest extent practicable the size and depth of final voids.	Area of final voids • Clareval • Weismantel	Area is not greater than: • 48 ha (Clareval). • 37 ha (Weismantel)	A landform assessment by a qualified expert undertaken to confirm that the areas are consistent with the Final Landform and Rehabilitation Plan
					Depth (m) of final voids: • Clareval • Weismantel	Depth is not deeper than: • 219 m (Clareval). • 78 m (Weismantel).	

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	J5	Landform stability	Minimise high wall, low wall, end wall and in-pit spoil slope instability risk so far as is reasonable and feasible.	Final void walls regraded to a stable grade that is consistent with the requirements of the Final Landform and Rehabilitation Plan.	Slope angles for the final voids highwalls will be: • ≤70° batter slopes on highwall (hanging wall); IRA ≤ 50° (approximately) (Clareval). • ≤70° batter slopes on highwall (hanging wall); IRA ≤ 50° (approximately) (Weismantel).	• As constructed survey. • A geotechnical assessment by a qualified expert undertaken to confirm that the highwall (hanging wall) slopes are stable and as designed.
						Slope angles in the final voids low walls will be: • <45° batter slopes on low wall (footwall) following coal floor contact; inter-ramp angle (IRA) ≤40°(approximately) (Clareval). • <45° batter slopes on low wall (footwall) ; IRA < 32°(approximately) following coal floor contact (Weismantel).	• As constructed survey. • A geotechnical assessment by a qualified expert undertaken to confirm that the low wall (footwall) slopes are stable and to design.
						Slope angles for the final voids endwalls will be: • ≤70° batter slopes on northern endwall; IRA ≤ 50°(approximately) (Clareval and Weismantel). • ≤37° batter slopes on southern endwall in-pit spoil; IRA ≤ 25° (approximately) (Clareval and Weismantel). • Weathered horizon ≤45° slopes (Clareval and Weismantel)	• As constructed survey. • A geotechnical assessment by a qualified expert undertaken to confirm that the endwall (sidewall) slopes are stable and as designed
					FoS	FoS for highwalls are a minimum of: • 1.5 (Clareval); and • 1.5 (Weismantel). For long term stability unless otherwise agreed with the NSW Resources Regulator.	Independent engineering slope failure mode analysis and report.
						FoS for low walls are a minimum of: • 1.5 (Clareval); and • 1.5 (Weismantel). For long term stability unless otherwise agreed with the NSW Resources Regulator.	
						FoS for endwalls and weathered horizon slopes are a minimum of: • 1.5 (Clareval); and • 1.5 (Weismantel). For long term stability unless otherwise agreed with the NSW Resources Regulator.	

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	J5	Surface Water	Minimise to the greatest extent practicable the drainage catchment of final voids.	Area of drainage catchments: • Clareval. • Weismantel.	Area is not greater than: • 109 ha (Clareval). • 53 ha (Weismantel).	• A landform assessment by a qualified expert undertaken to confirm that the areas are consistent with the Final Landform and Rehabilitation Plan. • Evidence that catchment areas confirmed to be suitable by the predictive surface water balance and post-mining groundwater model.
					Permanent up-catchment diversions.	Permanent up-catchment structures designed and constructed to be stable in the long-term, convey a 1% annual exceedance probability (AEP) rainfall events and minimise the catchment area as much as reasonably practicable.	A landform assessment by a qualified expert undertaken to confirm that the areas are consistent with the Final Landform and Rehabilitation Plan. Evidence that catchment areas confirmed to be suitable by the predictive surface water balance and post-mining groundwater model.
		J5	Surface Water	Minimise to the greatest extent practicable risk of flood interaction.	Probability of inundation in a 0.1% AEP 1 in 1000-year flood event.	Probability of inundation is negligible as determined by independent flood modelling.	Independent hydrological modelling report.
					Flood risk to privately owned properties.	Landform provides that there are no increased adverse flood impacts to privately owned properties.	Independent hydrological modelling report.
		J5	Landform stability	Final void landform is sympathetic of visual amenity and aesthetics in the area and comparable to surrounds where practicable.	Minimise visual impact of the final landform as far as is reasonable and feasible.	Landform is consistent with the Final Landform and Rehabilitation Plan. Vegetation has been established as required. Vegetative screens have been established and maintained to improve visual amenity (where required).	• Remote sensing. • Photographic records. • Visual assessment.
		J5	Ecological rehabilitation	Levels of ecosystem function have been established that demonstrate the rehabilitation is self-sustainable.	EFA indices: • Landscape Function Analysis. • Vegetation Dynamics. • Habitat Complexity.	Suitable EFA reference sites selected equivalent to the target vegetation community. Vegetation is developing similar to that found in the relevant reference site based on EFA results assessed by a suitably qualified expert.	• ITP – Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA: – Landscape Function Analysis. – Vegetation Dynamics Monitoring. – Habitat Complexity Monitoring.
		J5	Surface water	Designed and constructed to ensure adequate freeboard to ensure no spillage under any foreseeable conditions.	No spill from the voids to the surrounding environment.	Voids are non-spilling as confirmed by predictive final void water balance.	• Predictive final void water balance. • Final void water level monitoring
		J5	Surface water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.	Water quality monitoring results.	Median water quality for 24 months of data is within 10 % of the median values of control catchments and 25 % of the 80th percentile for EC, pH and TSS and 25 % of the 20th percentile for pH.	Water quality monitoring (rehabilitation runoff) as per the DCM Water Management Plan.

Table 6 (Continued):
Rehabilitation Objectives and Proposed Rehabilitation Completion Criteria

Final Land Use Domain	Mining Domains	Spatial Reference Field	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification or Validation Method
As above	As above	J5	Groundwater	Designed as long-term groundwater sinks or flow through system and to maximise groundwater flows across back-filled pits and emplacements to the final void.	Local groundwater system flowing to final voids or flow through.	Voids are sinks or flow through for the local groundwater system as confirmed by predictive postmining groundwater model.	• Pit shell digital terrain model. • Predictive post-mining groundwater model. • Groundwater monitoring. • Final void water level monitoring.
		J5	Groundwater	Groundwater quality is similar to, or better than the pre-disturbance water quality.	The measured water quality at important groundwater assets meets predictions. Modelled drawdown and water take is consistent with approval predictions.	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the site.	• Independent hydro-geological assessment report. • Monitoring reports.
		J5	Groundwater	Impacts to groundwater regime are within range as per the development consent(s) / pre-mining environmental assessment.	The measured water quality at important groundwater assets meets predictions. Modelled drawdown and water take is consistent with approval predictions.	Groundwater quality and groundwater regime are within range as predicted in environmental assessments and in accordance with water sharing plans and water allocations held by the site.	• Independent hydro-geological assessment report. • Monitoring reports.
		J5	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.	Hydrological and hydro-geological assessments are undertaken to determine water take at completion from the relevant water sources to confirm that sufficient allocations are held.	Adequate water allocations and associated licenses are held for all applicable structures.	Copy of any relevant approvals or evidence if approvals not required. Confirmation from relevant Government Agency (e.g. NRAR) that licences are held. Independent water harvesting compliance assessment.
		J5	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	*	*	*

***** DCPL is in the process of preparing rehabilitation completion criteria to align with this rehabilitation objective and will update this RMP once prepared.

4.2 REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA – STAKEHOLDER CONSULTATION

Key stakeholders were consulted during the preparation of the DCM EA (DCPL, 2010) and have been consulted during subsequent Modifications (DCPL, 2014). Further to this, consultation has been undertaken with key stakeholders during the preparation of previous DCM MOP/RMPs.

As required by Condition 57, Schedule 3 of Project Approval (PA 08_0203), DCPL consulted with the Biodiversity Conservation Division (BCD) and Planning and Assessment Division within the then Department of Planning, Industry and Environment (DPIE) (now DPE), DPIE-Water (now DPE-Water), MidCoast Council, and the DCM Community Consultative Committee (CCC) for comment, prior to submission of the DCM MOP/RMP (1 January 2020 – 31 December 2021) to the NSW Resources Regulator for comment and approval.

Ongoing consultation with and advice to the community and relevant stakeholders occurs via the CCC, DCM website, and DCPL's community hotline and response protocol.

In accordance with Clause 9, Schedule 8A of the *Mining Regulation 2016*, this RMP has been prepared in a form as specified by the Secretary using the *Form and Way – Rehabilitation Management Plan for Large Mine* (the Form and Way Guidelines) (NSW Resources Regulator, 2021).

The consultation undertaken during the preparation of all previous DCM MOP/RMPs, including the most recent MOP/RMP (1 January 2020 – 31 December 2021) is considered relevant to the preparation of this RMP as the overarching final land use, rehabilitation procedures, monitoring and completion criteria are generally consistent.

Nonetheless, the DCM RMP has been provided to the agencies listed in Condition 57, Schedule 3 of Project Approval (PA 08_0203). Comments have been received from the following agencies (Attachment B):

- BCD.
- DPE-Water.
- MidCoast Council.
- CCC.

BCD commented on the use of LFA as a rehabilitation indicator within the DCM Rehabilitation Objectives and Rehabilitation Completion Criteria (dated 14 July 2022). LFA and vegetation structure have been utilised as baseline monitoring metrics to track the progression towards meeting rehabilitation completion criteria since December 2013.

DCPL does not intend to update the proposed Rehabilitation Objectives and Rehabilitation Completion Criteria to remove the use of LFA given the history of the LFA methodology being undertaken at the DCM, as transitioning from the use of LFA would nullify rehabilitation data collected over the past nine years at the DCM.

As described in Section 4.1, the NSW Resources Regulator has approved the DCM Rehabilitation Objectives Statement. This RMP has been amended to substitute the proposed rehabilitation objectives with the approved rehabilitation objectives (Table 6) in accordance with Clause 11, Schedule 8A of the *Mining Regulation 2016*. Following submission of the rehabilitation completion criteria to the NSW Resources Regulator, this RMP will be further amended to substitute the proposed version (Table 6) with the version approved by the NSW Resources Regulator.

A summary of the consultation completed for rehabilitation and transition to mine closure at the DCM is provided in Table 7. Table 8 provides a summary of comments received from DPE-Water and DCPL's response.

Table 7:
Stakeholder Consultation for the Rehabilitation Management Plan

Relevant Stakeholder	Consultation Activity/ Form of Consultation
Resources Regulator	• Via the DPE - Major Projects Planning Portal. • Email. • Phone calls. • Site inspections. • Meetings. • Review of formal documentation.
DPE – Planning and Assessment Division	• Via the DPE - Major Projects Planning Portal. • Review of formal documentation.
DPE – Biodiversity and Conservation Division	• Via the DPE - Major Projects Planning Portal. • Review of formal documentation.
DPE – Water	• Via the DPE - Major Projects Planning Portal. • Review of formal documentation.
MidCoast Council	• Email. • CCC member. • Review of formal documentation.
CCC	• Email. • CCC Meetings and presentations. • Site inspections.

This RMP has been provided to the NSW Resources Regulator and key stakeholders for comment. All correspondence with key stakeholders to date is included in the Record of Consultation provided in Attachment B.

Table 8:
DPE-Water comments on the Rehabilitation Management Plan

Comment (Attachment B)	DCPL Response
The Rehabilitation Management plan is recommended to achieve the following outcomes. These are intended to meet the department's legislative, policy and water management requirements. • *Sharing of water must protect the water source, its dependent ecosystems and basic landholder rights.*	The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include objectives to hold sufficient water allocations throughout rehabilitation activities, ensuring that shared water sources, dependent ecosystems, and basic landholder rights would be protected.
• *Water sources, floodplains and dependent ecosystems are protected and restored.*	The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include objectives to restore ecosystem function by establishing self-sustaining native ecosystems, thereby protecting and restoring water sources, floodplains and dependent ecosystems.
• *Activities within a water source should avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, and where possible land should be rehabilitated.*	DCPL's overarching objective for the final rehabilitated landform is to establish a safe, stable and non-polluting landform compatible with the surrounding landscape and fit for sustaining the intended post mining land use. The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include reference to achieving geotechnical and geochemical stability, particularly in water sources that are retained in the final landform.
• *The final Rehabilitation Management Plan is made electronically available on a public accessible website.*	The DCM Rehabilitation Management Plan is available on the DCM's website.
• *A conceptual model/diagram clearly presents how the groundwater and surface water systems interact with the final landform. This is to be informed by recent environmental assessments/modelling reviews.*	DCPL is preparing predictive surface water balance and post-mining groundwater models to understand how the groundwater and surface water systems would interact with the final landform at the DCM. Upon completion of these models, the reports would be provided to DPE-Water.
• *The final design and location of surface drainage features achieves a stable landform and maintains or improves riparian corridor functioning. This is to be completed with reference to industry guidelines such as:* "Rehabilitation Manual for Australian Streams (LWRRDC 2000)", "Guideline: Works that interfere with water in a watercourse for a resource activity (DNRME 2019)" *and* "Guidelines for Controlled Activities on Waterfront Land (2012)" *or their latest versions.*	The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include objectives to create final landforms that are hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining. Notwithstanding, DCPL has updated the DCM Rehabilitation Objectives and Rehabilitation Completion Criteria to include reference to the relevant industry guidelines.

Table 8 (continued):
DPE-Water comments on the Rehabilitation Management Plan

Comment (Attachment B)	DCPL Response
• *Dirty runoff catchment areas are rehabilitated and the conveyance of clean surface runoff downstream is maximised.*	The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria, and this RMP, include commitments to: • ensure runoff from rehabilitated areas is suitable for discharge off-site to receiving environment; • remove existing diversions around the retained dams once the dams have been re-configured, to facilitate clean water recharge of the dams; • maintain sediment dams downstream of the waste emplacements until the revegetated surface is stable and the runoff water quality is suitable for release off-site as described in the WAMP; and • conduct water quality monitoring (of rehabilitation runoff) as per the DCM Water Management Plan.
• *Decommissioning of groundwater boreholes is in accordance with the* "Minimum Construction Requirements for Water Bores in Australia (2020)".	Any groundwater boreholes at the DCM would be decommissioned and rehabilitated in accordance with the *Minimum Requirements for Water Bores in Australia (2020)*.
• *Ongoing water take by the final landform via interception, storage or diversion is quantified and complies with relevant approvals and licences under the* Water Management Act 2000 *or a relevant exemption. Please note exemptions from the requirement to hold approvals under s.90 and 91 of the* Water Management Act 2000 *for approved SSD/SSI projects will not apply once the project approval ceases. Therefore, any relevant water management works that are to be retained will need to obtain an approval prior to the development consent lapsing.*	Prior to relinquishment of the DCM Project Approval (PA 08_0203), the appropriate approvals would be acquired for water management purposes relevant to the final landform.
• *Aquifer interference activities are designed to minimise ongoing water take and water quality impacts and meet the requirements of the NSW Aquifer Interference Policy.*	The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include objectives to prevent final voids from presenting a risk to important groundwater ecosystems and assets and have been updated to include reference to the *NSW Aquifer Interference Policy.*
• *Final voids do not present a risk to important groundwater ecosystems and assets (groundwater dependent ecosystems, alluvial aquifers, and landholder bores).*	As stated above, the DCM Rehabilitation Objectives and Rehabilitation Completion Criteria include objectives to prevent final voids from presenting a risk to important groundwater ecosystems and assets and have been updated to include reference to the *NSW Aquifer Interference Policy.*
• *Final voids are designed to be sinks or to flow through the local groundwater system and need to be confirmed by a post-mining groundwater model.*	DCPL is preparing predictive surface water balance and post-mining groundwater models to understand how the groundwater and surface water systems would interact with the final landform at the DCM. Rehabilitation Objectives and Rehabilitation Completion Criteria include the objective for final voids to be sinks or flow through systems for the local groundwater system, as confirmed by predictive post-mining groundwater model. Upon completion of these models, the reports would be provided to DPE-Water.

Table 8 (continued):
DPE-Water comments on the Rehabilitation Management Plan

Comment (Attachment B)	DCPL Response
• *Residual risk to water sources is clearly understood and minimised. This is to include relevant assessment documentation and updated risk assessments to meet the requirements of the NSW Aquifer Interference Policy. Further detail can be found in Fact Sheet 5 in Appendix C of the* "Guidelines for Groundwater Documentation for SSD/SSI Projects. Technical guideline (DPE 2022)".	A closure and rehabilitation risk assessment was conducted by IEMA (2021) to identify any residual risks for the closure of DCM. At the completion of the closure planning studies a final risk assessment would be undertaken to determine the potential residual risk of the final landform. The DCM Rehabilitation Objectives and Rehabilitation Completion Criteria have also been updated to include reference to the NSW Aquifer Interference Policy.
• *A monitoring and review program is included to ensure the rehabilitation outcomes are met.*	Rehabilitation at the DCM has been monitored since 2013 to ensure vegetation is establishing in the rehabilitation areas and to determine the need for any maintenance and/or contingency measures. Quality assurance measures would be undertaken, integrated into day-to-day operations, and implemented throughout the life of the operation until rehabilitation relinquishment has been achieved. DCPL also reports on rehabilitation within the DCM Annual Reviews and Annual Rehabilitation Report which is made publicly available on the DCM's website.
When available, submit documentation for review to assist in finalising the Rehabilitation Management Plan. This includes: *(i) the updated groundwater model report:* *(ii) the final void water balance; and* *(iii) the Life of Mine Review of the Potential Acid Forming (PAF) material disposal.*	The following reports will be provided to DPE-Water upon completion: • the updated groundwater model report; • the final void water balance; and • the Life of Mine Review of the Potential Acid Forming (PAF) material disposal.
When available, submit documentation for review to assist in finalising the Rehabilitation Management Plan. This includes the Coal Shaft Creek Reconstruction Plan.	DCPL will provide relevant rehabilitation and closure reports for review by the DPE-Water, including the Coal Shaft Creek Reconstruction Plan, upon completion.

Mine Closure Consultation

Proposed rehabilitation and post-mining land use concepts have been continuously developed throughout the DCM approval process, in consultation with relevant government agencies and key stakeholders, including the DCM's CCC.

Results of consultation undertaken with the stakeholders were incorporated into the DCM RMP.

DCPL will continue to consult with relevant government agencies and the community throughout the mine life and during mine closure.

Community Consultative Committee

The DCM CCC was established in 2003 in accordance with Schedule 5, Condition 5 of the Project Approval for the DEP and operates under the guidance of the DPE. Meetings are held quarterly and provide a forum for open discussion between the community, MidCoast Council, DCPL and other stakeholders on issues relating to the mine's operations, environmental performance and community engagement.

The CCC for the DCM is currently comprised of:

- an independent Chairperson;
- six local community representatives;
- two local government representatives (MCC); and
- two DCPL representatives.

The CCC conducts meetings either meeting on-site or in the local community. The CCC undertakes regular inspections, reviews environmental and audit reports and discusses any concerns, incidents or complaints that may have been registered. The CCC members are an active conduit between local communities and the DCM. Minutes are taken from each meeting and published on the DCM's website.

Items of discussion at these meetings include (but are not limited to) mine progress, rehabilitation activities, environmental monitoring reporting, complaints and any environmental assessments undertaken. Outcomes from CCC meetings and community liaison activities are documented annually in the Annual Review.

The CCC will continue to be consulted regarding mine closure process, objectives and concepts.

Aboriginal Groups

Consultation with Aboriginal groups about the DCM has been extensive and involved various methods including advertisements, meetings, correspondence and archaeological survey attendance prior to the commencement of, and during, the operation of the DCM.

Numerous groups have been consulted about the DCM to date, including:

- Barrington-Gloucester-Stroud Preservation Alliance Inc.;
- Garigal Aboriginal Community Inc.;
- Gidawaa Walang Cultural Heritage Consultancy;
- Johnsons Creek Conservation Committee;
- Karuah Local Aboriginal Land Council;
- Maaiangal Group; and
- Minimbah and District Aboriginal Elders Inc..

These groups will continue to be consulted during mine closure.

5 FINAL LANDFORM AND REHABILITATION PLAN

5.1 FINAL LANDFORM AND REHABILITATION PLAN – ELECTRONIC COPY

A FLRP has been prepared to show the proposed final land use and final landform at the end of the mine life. These plans are generally in accordance with the details of the EIS, Project Approval (PA 08_0203) and subsequent assessments.

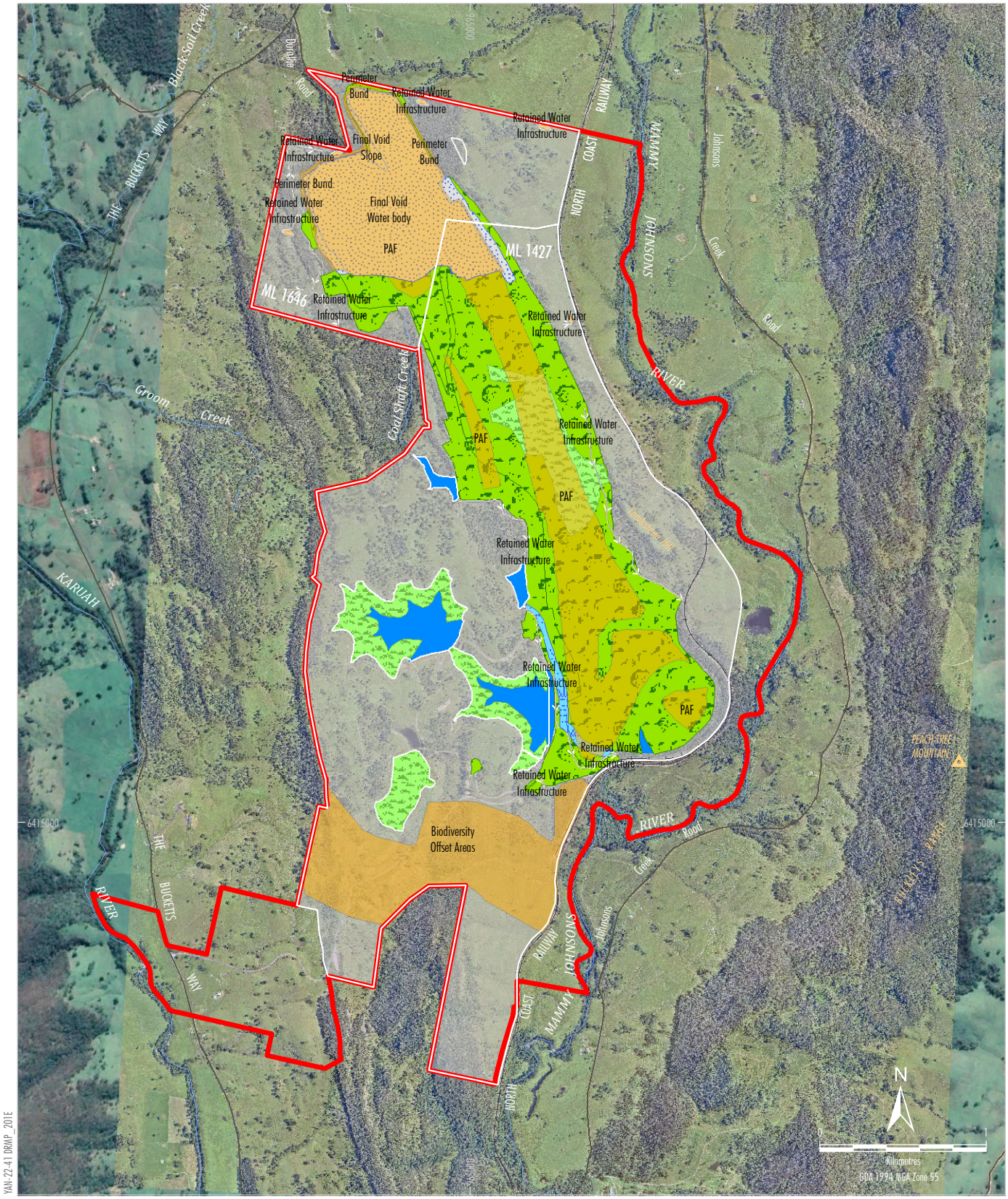
A simplified version of the FLRP has been developed and included in the body of this RMP as Plans 1 and 2. These plans include the following:

- Plan 1 (Final Landform Features):
  - Final Land Use Domains.
  - Final Landform Features.
  - Project Approval Boundary.
  - Current Titles.
  - Mine Operations Area (including subsidence areas).
- Plan 2 (Final Landform Contours):
  - Final Landform Contours.
  - Project Approval Boundary.
  - Current Titles.
  - Mine Operations Area (including subsidence areas).

In accordance with Clause 12, Schedule 8A of the *Mining Regulation 2016*, the DCM FLRP was submitted to the NSW Resources Regulator for approval. On 23 November 2022, the NSW Resources Regulator provided comments on the DCM FLRP. The revised FLRP was submitted to the NSW Resources Regulator for approval on 23 December 2022. On 12 April 2023, the NSW Resources Regulator provided additional commentary on the DCM FLRP. The revised FLRP was submitted to the NSW Resources Regulator for approval on 12 May 2023 addressing the NSW Resources Regulator's additional review commentary.

The NSW Resources Regulator approved the DCM FLRP on 22 August 2023. This RMP has been amended to incorporate the revised Plans 1 and 2 (i.e. DCM FLRP) in accordance with Clause 11, Schedule 8A of the *Mining Regulation 2016*.

DCPL notes that the NSW Resources Regulator has requested a supporting report be prepared to assess whether the environmental outcomes of the final landform at the DCM (as presented in the FLRP) are consistent with those assessed as part of the DEP Modification 2 EA (DCPL, 2014). DCPL is committed to submitting this report for the NSW Resources Regulator's records and consideration in Q2 2024.



YAN-22-41 DRNP_201E

LEGEND

Project Approval Boundary*
Coal - Current Title
Final Landform Features

Final Landuse Domain
Agricultural – Grazing
Final Void
Native Ecosystem
Water Management Areas
Water Storage (Excluding Final Void)

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

DURALIECOAL
Part of the Yancoal Australia Group

DURALIE COAL MINE

Final Landform Features

** Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.*

Plan 1

YAN-22-41 DRNP_202B

LEGEND

Project Approval Boundary*

Coal - Current Title

Final Landform Contours (5 m Intervals)

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

DURALIECOAL
Part of the Yancoal Australia Group

DURALIE COAL MINE

Final Landform Contours

** Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.*

Plan 2

6 REHABILITATION IMPLEMENTATION

6.1 LIFE OF MINE REHABILITATION SCHEDULE

In accordance with Condition 5, Schedule 2 of the Project Approval (PA 08_0203) mining activities at the DCM ceased on 31 December 2021 (i.e. no future disturbance is proposed at the site). Historically, areas disturbed by the DCM were progressively rehabilitated throughout mining activities in accordance with the schedules in previous MOP/RMPs and as reported in the Annual Reviews.

Rehabilitation at the DCM is undertaken progressively, behind the advancing open cut or once areas become available for rehabilitation and aims to create a structurally stable landform capable of sustaining the agreed post-mining land use(s).

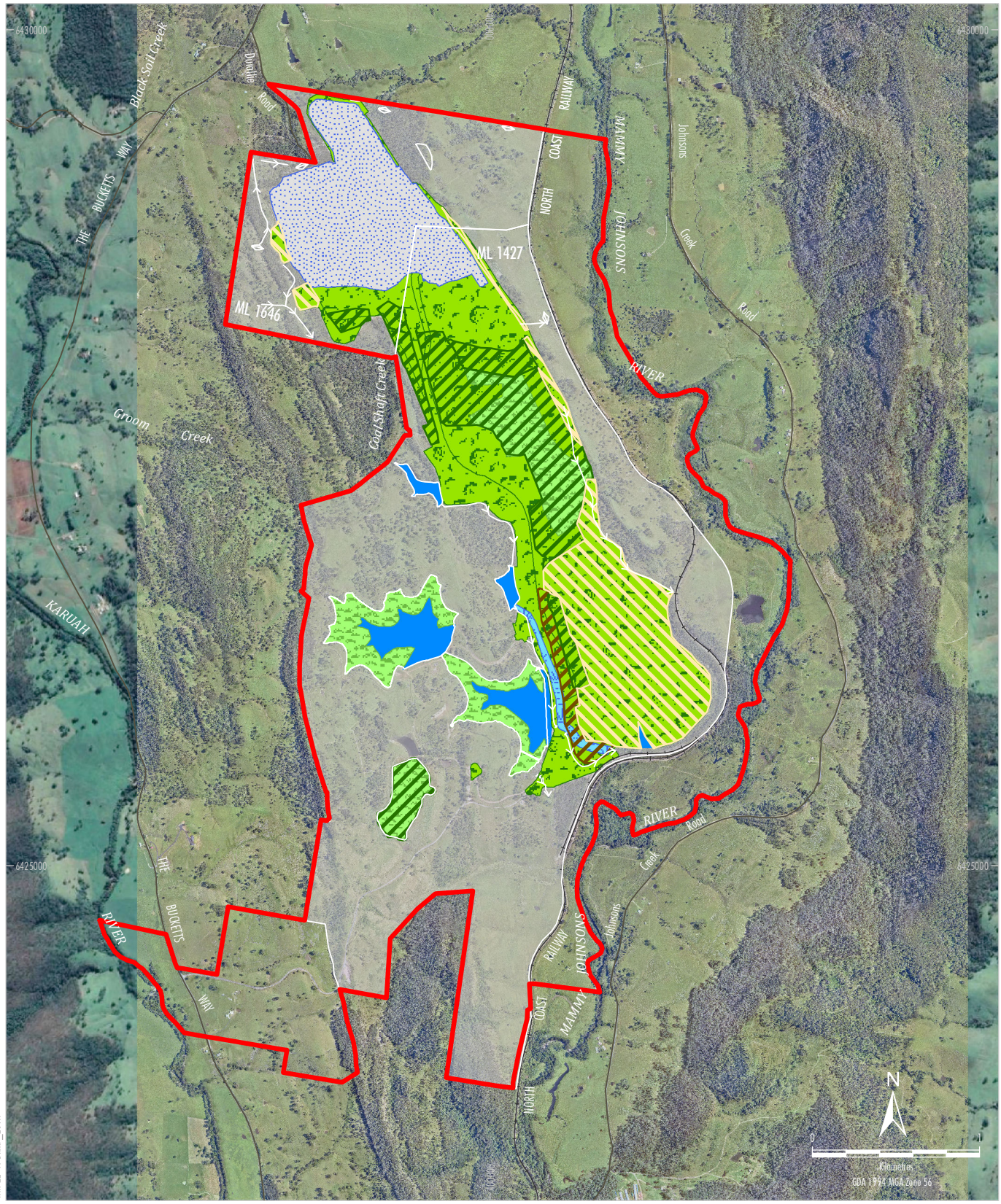
Table 9 and Plans 3A to 3D outlines the proposed rehabilitation schedule over the life of the DCM, from the commencement of this RMP (i.e. 1 July 2022) until mine closure and the achievement of the completion criteria for each final land use domain. The DCM Annual Rehabilitation Report and Forward Program provides further details of activities at the DCM from 1 July 2022 to 30 June 2025.

Table 9:
Proposed Rehabilitation Schedule Over the Life of the DCM

Year	Total Disturbance Footprint (ha)[1]	Incremental Rehabilitation Area (ha)	Cumulative Rehabilitation Area (ha)[1]	Comments/Explanation
Prior to RMP commencement (i.e. up to June 2022).	404.1	180.1	180.1	Mining operations ceased 31 December 2021. DCM transition to mine closure.
Year 3 (2025)	404.1	217.3	397.4	Completion of key infrastructure decommissioning (e.g. including water management infrastructure). Completion of all bulk earth works, landform establishment and ecosystem establishment.
Year 8 (2030)	404.1	6.7	404.1	All areas of disturbance have minimum ecosystem establishment level of rehabilitation. Monitoring and maintenance phase.
Year 13 (2035)	404.1	0	404.1	Achievement of the Rehabilitation Completion Criteria. Sign-off and relinquishment phase.

[1] Total Disturbance Area includes areas of land which are within the Active and Decommissioning phases.

[2] Total Rehabilitation Area includes areas of land which are within the Landform Establishment and Growth Medium Development, Ecosystem and Land Use Establishment, and Ecosystem and Land Use Sustainability phases.



LEGEND

Project Approval Boundary*
Coal - Current Title

Final Landuse Domain
Agricultural – Grazing
Final Void
Native Ecosystem
Water Management Areas
Water Storage (Excluding Final Void)

Rehabilitation Phase
Landform Establishment
Ecosystem and Land Use Establishment
Ecosystem and Land Use Development

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

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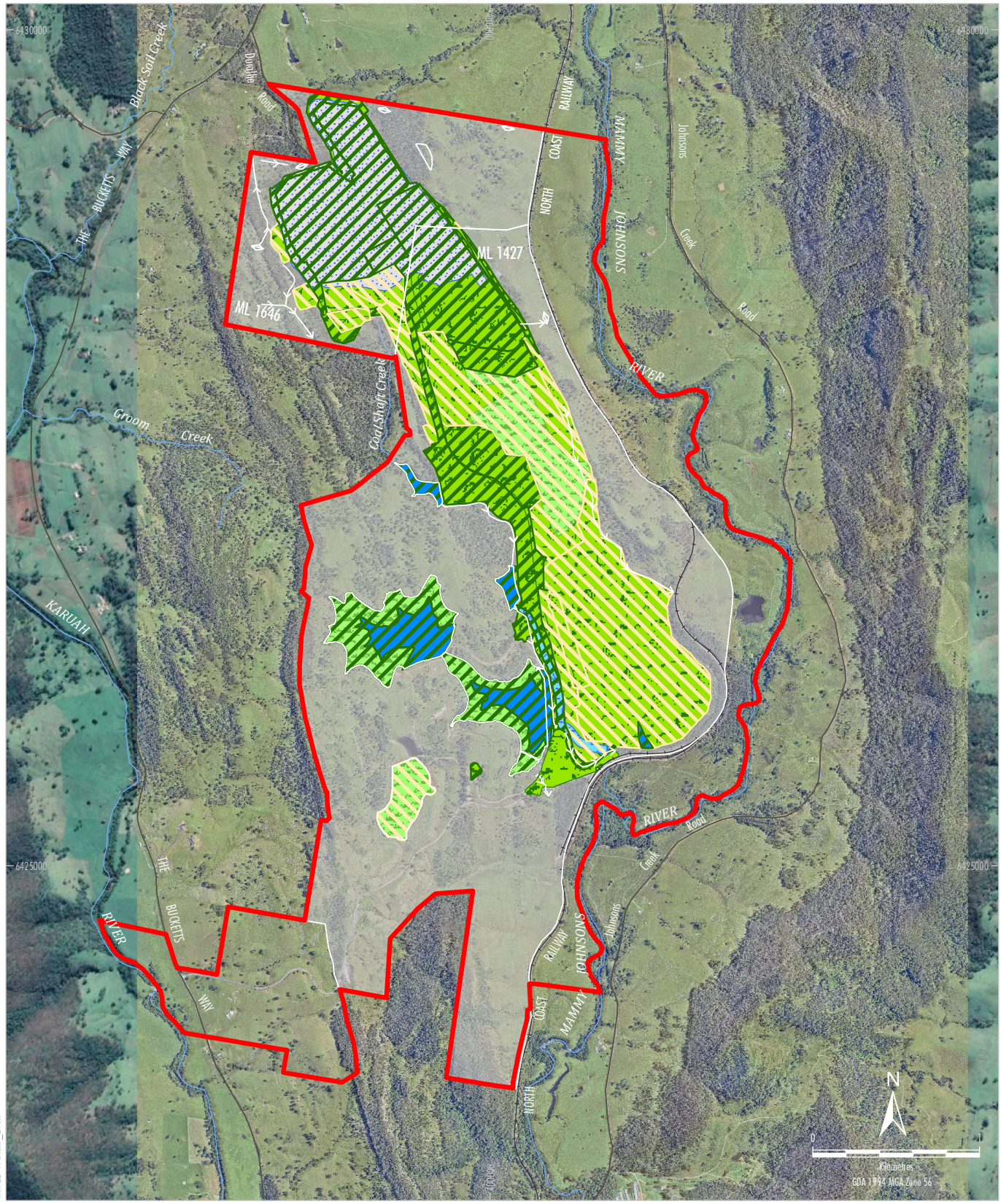
Life of Mine Rehabilitation Schedule - RMP Commencement (2022)

Plan 3A

** Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.*



LEGEND

Project Approval Boundary*
Coal - Current Title

Final Landuse Domain
Agricultural – Grazing
Final Void
Native Ecosystem
Water Management Areas
Water Storage (Excluding Final Void)

Rehabilitation Phase
Ecosystem and Land Use Establishment
Ecosystem and Land Use Development

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

* Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.

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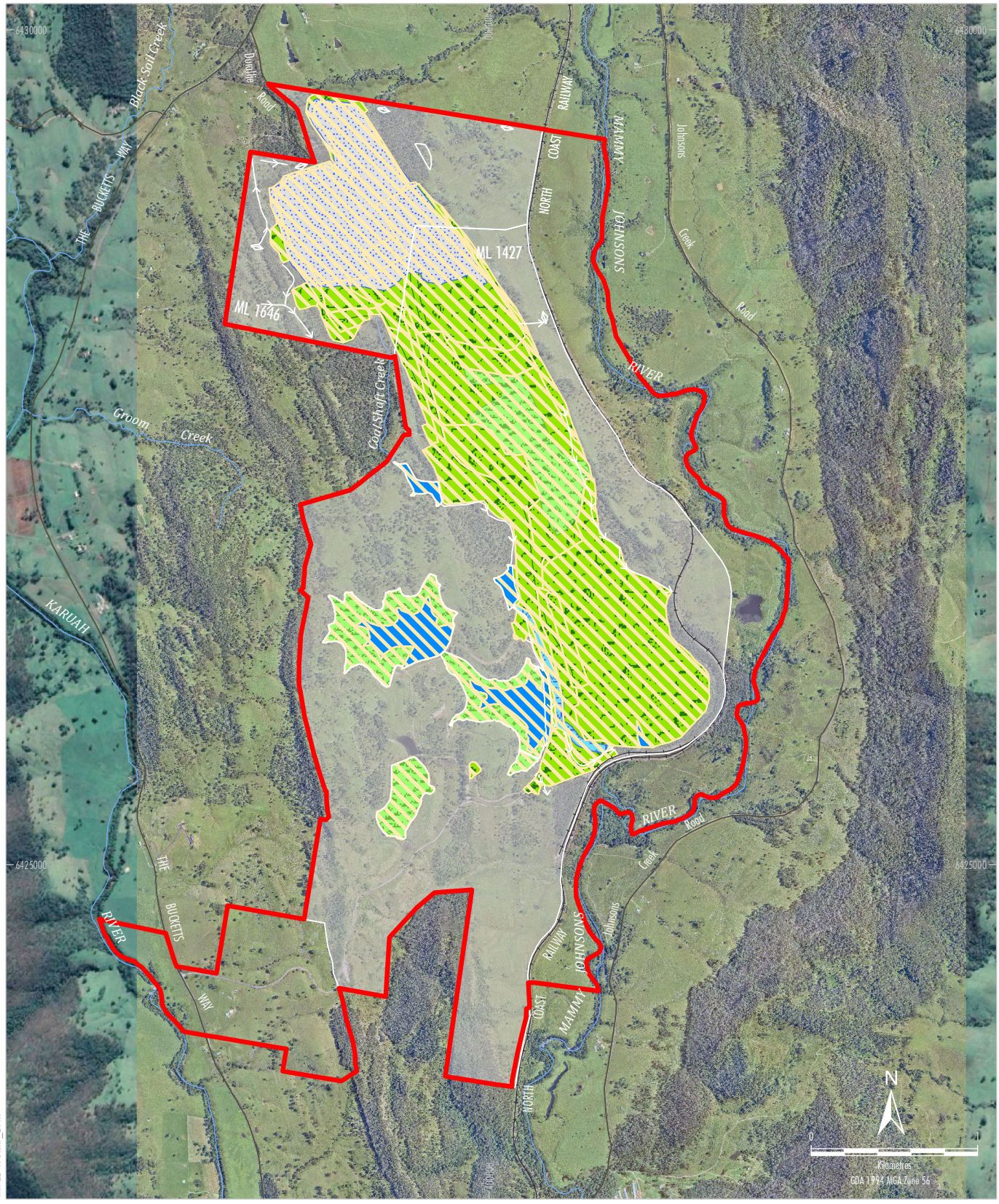
DURALIE COAL MINE

Life of Mine Rehabilitation Schedule - Year 3 (2025)

Plan 3B



YAN-22-41 DRMP_211A

LEGEND

Project Approval Boundary*
Coal - Current Title

Final Landuse Domain
Agricultural – Grazing
Final Void
Native Ecosystem
Water Management Areas
Water Storage (Excluding Final Void)

Rehabilitation Phase
Ecosystem and Land Use Development

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

** Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.*

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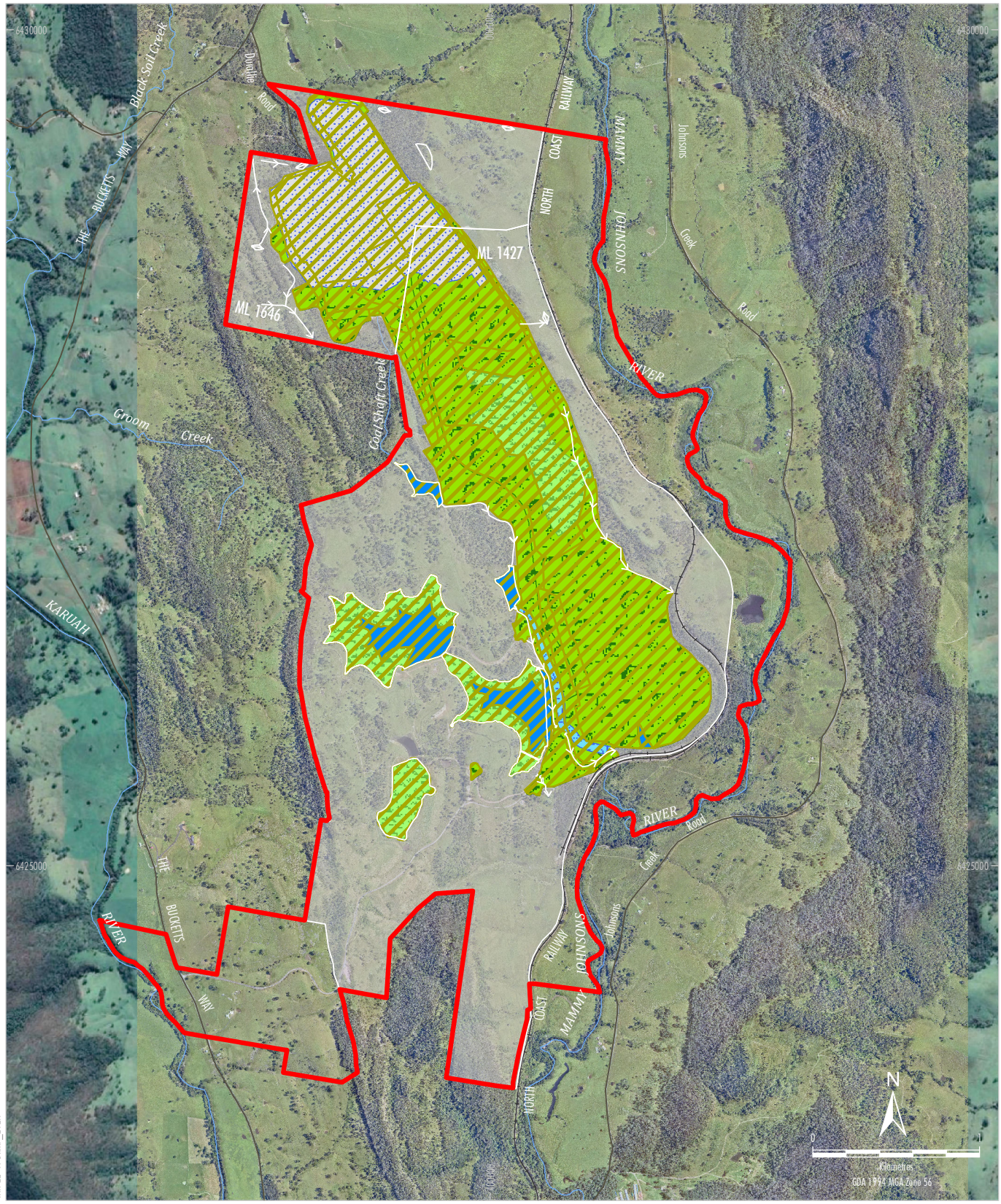
DURALIE COAL MINE

Life of Mine Rehabilitation Schedule - Year 8 (2030)

Plan 3C



YAN-22-41 DRMP_212A

LEGEND

Project Approval Boundary*

Coal - Current Title

Final Landuse Domain

Agricultural – Grazing

Final Void

Native Ecosystem

Water Management Areas

Water Storage (Excluding Final Void)

Rehabilitation Phase

Rehabilitation Completion (Sign-off)

Source: © NSW Spatial Services (2019)
Orthophoto: Google Earth CENS/Airbus (2020)

** Note: Appendix 1 Schedule of Land in Project Approval (08_0203) includes some part lots. For simplicity, whole lots are included in the graphical representation shown on this figure.*

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DURALIE COAL MINE

Life of Mine Rehabilitation Schedule - Year 13 (2035)

Plan 3D

In developing the rehabilitation schedule, several assumptions were made to ensure that rehabilitation in undertaken progressively and as soon as reasonably practicable, including:

- No major changes to mining schedules due to market conditions or other reasons.
- There are no extreme weather events that would prohibit landform establishment or rehabilitation progression (e.g. severe and prolonged dry or wet periods).
- Availability of suitable seed and tubestock.
- Workforce constraints (e.g. Covid 19 or other pandemic).

6.2 PHASES OF REHABILITATION AND GENERAL METHODOLOGIES

The rehabilitation methodologies described in this section have been developed in consideration of the key risks identified at the DCM from the 2021 *Closure & Rehabilitation Risk Assessment* (IEMA, 2021) (Section 3). The methodologies are link to the risk reduction strategies/actions developed to adequately control the individual risk items as described in Section 3 and Attachment A.

The final land use objectives will be achieved through a series of rehabilitation phases as defined in the Form and Way guideline and detailed below:

- **Active** – The Form and Way guideline states in the context of rehabilitation, land associated with mining domains is considered 'active' for the period following disturbance until the commencement of rehabilitation.
- **Phase 1: Decommissioning** – Removal of infrastructure associated with mining activities including preparation plants, hard stand areas, buildings, contaminated materials and 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 2: 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, for large mines, the approved FLRP). In addition to profiling the surface of rehabilitation areas to the approved final landform profile 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 3: Growing Media Development** – This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish 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. subsoils, topsoils, organic additives and overburden surface is usually required in this phase to cross check data from the earlier phases.
- **Phase 4: 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 5: 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 FLRP. 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 6: Rehabilitation Completion** – 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 FLRP. 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.

The phases listed above, and methodologies (where relevant) are discussed in more detail in the following sub-sections.

6.2.1 Active Mining Phase

As stated in Section 6.1, mining activities at the DCM ceased 31 December 2021. Accordingly, the following subsections summarise how key aspects of the DCM active mining phase were historically managed at the DCM and how relevant components continue into the closure phase.

a. Soils and Materials

General soil resource management practices would include the stripping and stockpiling of soil resources for use in rehabilitation. The objectives of soil resource management for the DCM are to:

- identify and quantify potential soil resources for rehabilitation;
- optimise the recovery of useable soil reserves during soil stripping operations; and
- manage soil reserves so as not to degrade the resource when stockpiled.

Topsoil material has been recovered throughout the life of the DCM mining operations. The DCM's existing soil stockpiles are managed to maximise long-term viability through implementation of the following practices:

- the surfaces of the completed stockpiles are left in a "rough" condition to help promote water infiltration and minimise erosion prior to vegetation establishment;
- soil stockpiles have a maximum height of 3 m in order to limit the potential for anaerobic conditions to develop within the soil stockpile;
- soil stockpiles have an embankment grade of approximately 1 V:4 H (to limit the potential for erosion of the outer pile face);
- stockpiles will be sown with a stabilising cover crop once established; and
- soil rejuvenation practices (e.g. fertiliser addition) are undertaken (if required) prior to re-spreading as part of rehabilitation works.

Existing topsoil stockpiles will continue to be managed to maintain soil viability until they are all utilised as part of the closure program. Topsoil stockpiles are located along the edge of open cut pits and along the side of haul roads and Waste Emplacements.

A site topsoil balance is undertaken annually, and the volume compared to the total remaining disturbed area requiring rehabilitation. Annual reporting of the site soil balance and rehabilitation performance is provided in the DCM Annual Review.

b. Flora

Vegetation Clearance and Seed Collection

A Vegetation Clearance Protocol has been developed for the DCM and is described in the BMP. Any land disturbance and vegetation clearance activities at the DCM were undertaken in accordance with this Protocol. No new disturbance areas (within approved surface disturbance areas) are proposed at the DCM.

Seed collection was undertaken in accordance with the BMP and the seed collected (type and quantity) was reported in the Annual Review.

Threatened Flora Species Management

No threatened flora species, populations or ecological communities listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) or the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) have been recorded within the DCM area (FloraSearch, 2014).

Management measures relevant to flora species are undertaken in accordance with the BMP.

Weed Management

Weed management at the DCM is undertaken in accordance with the DCM BMP. General weed management measures include:

- minimisation of seed transport from the site during operations through the use of the DCM vehicle wash bay;
- identification of weeds via regular site inspections and communication with landholders and regulatory authorities;
- mechanical removal of identified weeds and/or the application of approved herbicides in authorised areas; and
- specific control of priority weeds and weeds of concern.

Where relevant, appropriately qualified persons will be engaged to undertake weed control. Follow-up site inspections will occur to determine the effectiveness of weed control. Weed management and monitoring results will be reported in the Annual Review.

Flora Monitoring Management

The DCM Rehabilitation Monitoring Program (Section 8) includes monitoring for the presence of weeds in areas of rehabilitation. Rehabilitation monitoring results are used to inform the requirement for weed control measures in the rehabilitation areas. The DCM's soil stockpiles are also inspected for presence of weed species, and subject to weed control as required.

c. Fauna

Threatened Fauna Species

The potential impacts to fauna are currently managed through the implementation of measures included in the BMP and the Giant Barred Frog Management Plan.

Threatened fauna species listed under the BC Act and EPBC Act that may potentially be affected by the DCM are listed below (Australian Museum Consulting [AMC], 2014):

- Swift Parrot (*Lathamus discolor*);
- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*);
- Speckled Warbler (*Chthonicola sagittata*);
- Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*);
- Brush-tailed Phascogale (*Phascogale tapoatafa*);
- Squirrel Glider (*Petaurus norfolcensis*);
- Eastern Bentwing-bat (*Miniopterus orianae oceanensis*);
- Eastern Freetail-bat (*Micronomus norfolkensis*); and
- Large-footed (or Southern) Myotis (*Myotis macropus*).

The DCM area provides limited habitat for migratory species. Four migratory birds have been recorded in the disturbance area and surrounds (i.e. the White-throated Needletail [*Hirundapus caudacutus*], Rainbow Bee-eater [*Merops ornatus*], Rufous Fantail [*Rhipidura rufifrons*] and Black-faced Monarch [*Monarcha melanopsis*]) (AMC, 2014).

Fauna Habitat Management

Fauna habitat management measures during vegetation clearance are described in the BMP.

No further land disturbance or vegetation clearance is proposed at the DCM. As such, habitat management measures associated with vegetation clearance activities (e.g. salvage of habitat features and tree hollows) are unlikely to be implemented at the DCM.

Habitat Enhancement and Nest Box Program

Habitat features (e.g. trunks, logs, large rocks, branches, small stumps and roots) were salvaged, during vegetation clearance activities and stockpiled for relocation to areas undergoing rehabilitation. Surplus logs were introduced into the rehabilitation areas to provide habitat resources for a range of invertebrate and ground dwelling fauna. As vegetation clearance activities and the Vegetation Clearance Protocol ceased following the cessation of mining operations on 31 December 2021, the salvage of habitat features and materials also ceased at this time.

The existing nest box program is in place at the DCM to provide nesting habitat for birds, arboreal mammals, and bats and is documented in the BMP.

The nest boxes will be monitored by suitably qualified personnel to observe fauna usage. A monitoring report will continue to be prepared annually that includes a summary of previous monitoring reports. The monitoring results will be reported in the Annual Review.

Vertebrate Pest Management

Management of pest animals at the DCM (including rehabilitation areas) is undertaken in accordance with the BMP. Measures to control pest animals include:

- Monitor the abundance of pest animals.
- Identification of suitable control methods for target pest animals (e.g. trapping and/or baiting for European Rabbits [Oryctolagus cuniculus] and European Red Foxes [Vulpes vulpes]).
- Implementation of the selected control methods on the target pest animals.
- Re-monitor the abundance of pest animals to evaluate the effectiveness of the control methods.
- Follow-up control where previous control has been sub-optimal.

Measures to control pest animals will be implemented by an appropriately qualified person. A summary of the pest animal management and monitoring results will be reported in the Annual Review.

d. Rock/Overburden Emplacement Management

Waste rock extracted from the Weismantel and Clareval Open Pits include both NAF and PAF rock. Waste rock (including overburden and interburden) mined was used to in-fill the Weismantel and Clareval voids behind the historically advancing open cut, as well as being placed in the out-of-pit Waste Emplacement. Appropriate waste rock management including delineation and controlled placement of rock wastes on the basis of acid forming potential is undertaken.

e. Waste Management

All waste streams generated at the DCM have historically been managed in accordance with the DCM Waste Management Plan. Key waste streams (apart from waste rock) generated at the DCM comprise:

- recyclable and non-recyclable general wastes;
- sewage and effluent; and
- other wastes from mining and workshop activities (e.g. waste oils, scrap metal and used tyres).

All general domestic waste (e.g. general solid [putrescibles] waste 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. DCPL will maintain a register of regulated waste collected by the licensed waste contractor.

Waste tyres have been stockpiled and disposed in the backfilled sections of pit voids. Tyres will be placed in discrete lots and buried with a minimum cover of 5 m, and avoid other combustible material. Records of buried locations and depths were maintained.

Scrap metal is collected by a licensed waste contractor for recycling.

Sewage and wastewater from ablution facilities on-site is collected and transferred via a sewerage system to the existing on-site sewage treatment plant. Sewage is treated in the on-site sewage treatment plant (that consists of an aerobic treatment system) and is disposed of in a manner to the satisfaction of the EPA (i.e. EPL 11701) and the MCC.

f. Geology and Geochemistry

The coal resource mined at the DCM was located within the Permian aged Gloucester Basin in NSW. The DCM is located in the southern closure of the main synclinal structure of the Gloucester Basin and is associated with the coal bearing strata of the Dewrang Group. The Dewrang Group comprises three main stratigraphic units, namely: Mammy Johnsons Formation; Weismantels Formation; and Duralie Road Formation.

The coal seams mined at the DCM included:

- the Weismantel Seams;
- the Clareval Seams; and
- the Cheerup Seams.

The underlying basement rocks are principally volcanics of Early Permian (i.e. Alum Mountain Volcanics) and Carboniferous age that were folded during formation of the Gloucester Basin. The Early Permian and Carboniferous volcanic rocks are typically erosion resistant and form the more prominent ridges to the east and west of the DCM.

The Weismantel and Clareval Seams are mostly NAF, however, geochemical assessments have indicated the presence of PAF waste material above the Weismantel Seam and the Clareval Seam within the extent of the open pits. To control the risk of adverse outcomes from incorrect management of PAF materials, the selective handling of PAF material is describe in Section h below.

g. Material Prone to Spontaneous Combustion

Spontaneous combustion is oxidation at exposed coal surfaces which occurs at or near ambient temperature producing heat energy. DCM has historically had minor spontaneous combustion events associated with coal stockpiles older than one year and in-pit coal heating (related to adjacent blasted reactive ground). Spontaneous combustion is managed by the Spontaneous Combustion Management Plan. The Spontaneous Combustion Management Plan outlines measures to control potentially spontaneously combustible material including monitoring, encapsulation and extinguishment.

h. Material Prone to Generating Acid Mine Drainage

An assessment of the geochemical characteristics of the waste rock material associated with the DCM is provided in the DEP Geochemical Assessment of Overburden and Floor Rock (Environmental Geochemistry International Pty Ltd, 2009). The potential risks associated with PAF material are described in the Geochemical Assessment and also in the 2021 *Closure & Risk Assessment* (IEMA, 2021) (Attachment A).

A small percentage of the mined waste rock at the DCM is PAF and was managed by selective mining and management in accordance with the PAF Material Management Plan which is a component of the Surface Water Management Plan (SWMP). PAF management at the DCM includes the following components:

- PAF material identification and separation procedures;
- PAF material storage procedures; and
- monitoring of surface water and groundwater to determine the effectiveness of PAF material controls.

PAF waste material was segregated and selectively handled. The location of PAF material has been determined by geological modelling, informed by ongoing exploration activities and field sampling. PAF material was mined to the modelled PAF limits before placement in accordance with the PAF Material Management Plan. Confirmation of the thickness of the PAF band was periodically assessed by field sampling and laboratory analysis (utilising net acid generation testing).

Limestone was selectively placed on the open pit floor and PAF waste emplacement lifts/faces to minimise the release of acid rock drainage products. PAF material was stored in two distinct manners at the DCM, both in the out-of-pit Waste Emplacement and in-pit Waste Emplacement.

In the out-of-pit Waste Emplacements at the DCM, the PAF material was encapsulated within appropriately designed and constructed containment cells and capped with a clay capping layer.

For the in-pit Waste Emplacement, once PAF material was placed within the designated PAF management area of the open pit (i.e. below the post-mining water table), a layer of NAF material was placed above the emplaced PAF material. Upon final placement of sufficient NAF material to construct the design profile for the given section of the emplacement area, shaping, drainage construction, topsoil placement and revegetation is undertaken.

i. Ore Beneficiation Waste Management (Reject and Tailings Disposal)

ROM coal from the DCM was transported to the SMC Coal Handling and Preparation Plant to be blended and processed with ROM coal from the SMC, hence no coal rejects were generated at the DCM. ROM coal was transported from the DCM to the SMC in accordance with Conditions 7 and 13, Schedule 2, and Condition 48, Schedule 3 of the Project Approval (PA 08_0203). Coal rejects are managed at the SMC.

j. Erosion and Sediment Control

Erosion and sedimentation control will be undertaken in accordance with the Erosion and Sediment Control Plan, a component of the Water Management Plan (WAMP).

The primary objectives of the erosion and sediment control at the DCM are to:

- minimise and control soil erosion and sediment generation in areas disturbed by ongoing mining and associated activities; and
- minimise the potential for sediment generated from site activities to adversely affect the water quality of the Mammy Johnsons River or the Karuah River.

Characteristics of soils at the DCM include high gully erosion and sheet erosion risk (Henderson, 2000). The water management and sediment control systems at the DCM have been successful in controlling potential erosion and sediment impacts based on on-site and downstream surface water monitoring.

Control strategies for soil erosion and sediment migration for the DCM include:

- Maximum separation of runoff from disturbed and undisturbed areas.
- Construction of sediment dams downstream of disturbed areas to contain runoff up to specified design criteria (refer Design Criteria in the SWMP).
- Subsequent priority use of these waters in DCM related activities and/or natural controlled release to substantial buffer zones in a manner that minimises the potential for change to downstream turbidity.

- Selective use of benign flocculants such as gypsum to assist in the settlement of suspended solids if required.
- Construction of surface drains to facilitate the efficient transport of surface runoff.
- Construction of silt fences downslope of disturbed sites.
- Rapid and progressive stabilisation of disturbed surfaces.

Erosion and sediment control structures used at the DCM include:

- temporary upslope diversion drains;
- downslope collection drains;
- sediment dams; and
- sediment dam spillway channels.

The design criteria for the sediment control structures are outlined in the WAMP.

k. Ongoing Management of Biological Resources for Use in Rehabilitation

Management of biological resources (e.g. topsoil stockpiles and salvaged habitat features) are described in Sections 6.2.1a and c.

l. Mine Subsidence

The DCM is an open cut mining operation and is therefore not affected by mine subsidence.

m. Management of Potential Cultural and Heritage Issues

In accordance with Condition 46, Schedule 3 of Project Approval (08_0203), DCPL implements a HMP which includes measures to manage potential impacts on items of heritage significance at the DCM.

Known Aboriginal and European Heritage sites within the Project area and surrounds are fully described within the DEP EA (DCPL, 2010) in Appendices J (Aboriginal Heritage) and K (European Heritage), respectively. A further Aboriginal Cultural Heritage Assessment was also undertaken for the Duralie Open Pit Modification 2014, however no additional heritage sites were identified.

The HMP sets out the salvage, excavation, monitoring and management measures for archaeological sites and other Aboriginal objects located at the DCM, in accordance with the existing permits and consents. The HMP details the management of registered sites and other Aboriginal objects within the DCM area.

n. Exploration Activities

DCPL is authorised to conduct exploration activities within Authorisation 315, ML 1447 and ML 1646. No further exploration activity is planned in the vicinity of the DCM. However, future exploration activities within Authorisation 315 are expected to focus around the SMC area. Other works will include studies and reviews of the existing data package and ongoing data management, review and interpretation to support future assessments.

6.2.2 Decommissioning

A detailed DCM Mine Closure Plan and Schedule is provided in Appendix 1 of this RMP and includes an infrastructure decommissioning and demolition strategy. Decommissioning works are anticipated to be undertaken as soon as reasonably practicable in accordance with Condition 56, Schedule 3 of the Project Approval (PA 08_0203). Further detail regarding decommissioning activities is located in the DCM Annual Rehabilitation Report and Forward Program.

a. Site Security

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

- Induction programmes for employees, contractors and visitors.
- Signage and communication protocols for visitors and suppliers.
- Identification systems for visitor access to the site.
- First aid training requirements for employees and contractors.
- Fence lines maintained in an operational condition.
- Speed control signs have been installed on roads on DCPL-owned land.
- Maintenance of locked gates around the site for security purposes.

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

Site security measures will be implemented for the duration of the closure program. These measures will be maintained during closure, decommissioning and demolition activities to prevent unauthorised access and to ensure public safety. Security measures will include:

- fencing and signposting of the site;
- security patrols;
- all personnel, contractors and visitors will be required to undertake a relevant site induction and sign in and out of the site; and
- all visitors will be required to be accompanied by a site representative at all times.

b. Infrastructure to be Removed or Demolished

Post-operations, the key rehabilitation objectives for the infrastructure areas are to decommission and remove all infrastructure, unless otherwise agreed by the determining authority (Section 4), as required by Condition 55, Schedule 3 of the Project Approval (08_0203). The DCM Mine Closure Plan and Schedule (Appendix 1) includes consideration for infrastructure decommissioning including:

- Identify and remove/demolish all non-active infrastructure which is not required for the remainder of processing activities.
- Undertake consultation to confirm any alternative use for retained infrastructure (i.e. rail loop, haul roads, access tracks and dams) post-mining.

During the decommissioning phase, the priority will be to dismantle fixed equipment and infrastructure for removal from site and re-use at another location or recycled. Non-salvageable/non-recyclable and non-contaminated infrastructure will be disposed of at suitable off-site disposal areas (or on-site subject to relevant approvals being obtained).

Main Infrastructure Area and Administration Facilities

Consistent with the DEP EA and 2014 Modification EA, redundant site infrastructure will be removed and decommissioned gradually. Infrastructure located at the DCM that will be removed throughout the closure phase include:

- coal handling infrastructure;
- workshop buildings and stores;
- heavy vehicle servicing, parking and washdown facilities;
- sewage treatment facilities; and
- dangerous goods storage facilities.

The key rehabilitation objectives for the infrastructure areas are to:

- Decommission and remove all infrastructure, unless otherwise agreed by the determining authority.
- If there are any contaminated soils associated with the site workshops or contaminated sediments in the mine water dams, these will be identified and remediated in accordance with the requirements of the NSW *Contaminated Land Management Act 1997*.
- Profile the domain to a free-draining landform.
- Revegetate the domain to pasture or native ecosystem.

As stated above, dismantled and removed infrastructure would be subject to re-use at another location or, if possible, recycling. Non-salvageable/non-recyclable and non-contaminated infrastructure would be disposed of at suitable off-site disposal areas (or on-site subject to relevant approvals being obtained).

Railing Loading Facility

Rail loading facilities will be decommissioned and removed in consultation with DPE and Australian Rail Track Corporation. If the determining authority requires the decommissioning of the rail siding, DCPL will rehabilitate this area as follows:

- removal of line and signalling infrastructure up to the junction with the main north coast rail line;
- identify any contaminated soils associated in the rail siding area and remediate in accordance with the requirements of the NSW *Contaminated Land Management Act 1997*;
- DSC3B – Acceptable Flood Capacity of Dams;
- profile to a free-draining landform; and
- revegetate the area to native ecosystem.

Haul Roads

Consistent with the DEP EA and 2014 Modification EA, DCM haul roads will be decommissioned, reprofiled or removed where required, topsoiled and revegetated to native ecosystem unless otherwise agreed by the determining authority (e.g. retained for agricultural use). Light vehicle access tracks would be retained for future land management access.

Water Infrastructure Decommissioning Strategy

Minor water management structures and sediment control dams will be decommissioned and rehabilitated or retained as farm water dams in consultation with relevant regulatory authorities and private landholders (if applicable).

Sediment dams downstream of the waste rock emplacements will be maintained until the revegetated surface is stable and the runoff water quality is suitable for release off-site. The stability of the landform will be determined by rehabilitation monitoring.

Decommissioning of water management infrastructure (e.g. Mine Water dams) and on-site irrigation system infrastructure has commenced. Pumps and pipelines will be removed from site unless required for the final land-use. A Detailed Decommissioning Strategy is detailed in the DCM Mine Closure Plan and Schedule (Appendix 1). Auxiliary Dam 1 has been dewatered, decommissioned and rehabilitated.

The Coal Shaft Creek diversion will be decommissioned following the construction and commissioning of the Coal Shaft Creek Reconstruction. See further detailed on the Coal Shaft Reconstruction Management Plan.

c. Buildings, Structures and Fixed Plant to be Retained

Some infrastructure may be retained on-site if suitable justification is provided to support the post-mining land use and agreed with relevant regulatory authorities. Any infrastructure to be retained will be identified in the Decommissioning & Demolition Strategy included in the Mine Closure Plan and Schedule (Appendix 1), and details included regarding outcomes of consultation.

Some concrete hardstands, administration and ablution buildings, site access roads, sheds, buildings and sediment dams may be retained for alternate post-mining uses, subject to consultation with the relevant stakeholders.

Electricity transmission infrastructure will be retained for future use by landholders unless during consultation landholders/stakeholders determined it is no longer required, in which case it will be decommissioned and removed from site.

The rail siding may also be retained for future use if agreed with relevant regulatory authorities and if appropriate approvals are obtained.

It is anticipated that some internal roads will be retained for future use to facilitate access through the site.

Retained Water Infrastructure

The following water structures will be retained for future agricultural use and environmental benefit:

- MWD;
- Auxiliary Dam No. 2; and
- Coal Shaft Creek reconstruction.

The MWD and Auxiliary Dam No. 2 retained in the final landform would, however, be reduced in size. A decommissioning strategy for the DCM mine water dams is provided in the DCM Mine Closure Plan and Schedule (Appendix 1). The dams would be dewatered (with mine water transferred to the final voids), decontaminated (e.g. sediments excavated and disposed off-site at a licenced facility) and new spillways constructed to the designed height. Existing diversions around the retained dams would be removed, once the dams have been re-configured, to facilitate clean water recharge of the dams. As such, future water quality of the dams is expected to reflect up-catchment water quality.

Coal Shaft Creek is required to be reconstructed following the completion of mining activities. The Coal Shaft Creek Reconstruction Plan is described in the DCM Mine Closure Plan and Schedule (Appendix 1).

A number of up-catchment diversions will be permanent structures that will remain post-mining. Up-catchment diversions which don't provide a future beneficial use will be removed.

d. Management of Carbonaceous / Contaminated Material

Management of contaminated materials is identified via a Contaminated Land Assessment. Details of the assessment are described in the DCM Mine Closure Plan and Schedule (Appendix 1).

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), by hydrocarbon spillage (e.g. workshops, fuel storage areas) or by sedimentation (e.g. dams which have directly received pit water).

The Contaminated Lands Assessment will provide recommendations for the development of a Remediation Action Plan, that will inform future contamination clean-ups.

All contamination areas will be remediated as recommended in the Remediation Plans, which is expected to involve excavation of the contaminated materials and disposal at an off-site licensed facility or treated on-site subject to relevant approvals being obtained. The remediation of any identified contaminated land would be undertaken in conjunction with the Infrastructure Decommissioning Strategy. Rehabilitation of the area would be undertaken in accordance with the rehabilitation objectives for the Infrastructure Area Domain (i.e. revegetated to native ecosystem), or domain applicable to the area.

e. Hazardous Materials Management

Hydrocarbon storage facilities will continue to be operated in accordance with the requirements of AS 1940:2017 *The Storage and Handling of Flammable and Combustible Liquids*. All explosives at the DCM will continue to be stored in accordance with the requirements of AS 2187.1:1998 *Explosives – Storage Transport and Use – Storage*.

No chemicals or hazardous materials will be permitted on-site unless accompanied by the appropriate Safety Data Sheet.

A hazardous materials assessment will be undertaken for closure and will inform the Decommissioning & Demolition Strategy and the Closure Waste Management Plan.

f. Underground Infrastructure

The DCM is an open cut mining operation and therefore does not include underground infrastructure.

6.2.3 Landform Establishment

The following subsection details the key characteristics of landform establishment at the DCM in accordance with the design of the approved FLRP (Section 5).

a. Water Management Infrastructure

Water Management

Management of the site water management system is conducted in accordance with the DCM WAMP required by Project Approval (PA 08_0203).

The water management system at the DCM comprises the following:

- water management storages;
- diversion of runoff from catchment areas upslope of the mine disturbance area;
- runoff control on disturbed and rehabilitated areas at the mine;
- runoff control on infrastructure areas;
- erosion and sedimentation control;
- open pit dewatering;
- disposal of excess water through on-site irrigation; and
- sewage treatment and disposal of effluent.

Water Management Storages

Water stored on-site includes groundwater inflows to the open pits and incident rainfall and runoff from mine disturbance areas at the DCM.

As mining of the Clareval Open Pit has ceased and the post-mining land use for the Clareval Open Pit will be a final void, water will be left to gradually fill the pit.

Water pumped from sumps in the Weismantel Open Pit was preferentially transferred to the Clareval Open Pit. Mine water will continue to be stored in the MWD and Auxiliary Dam No. 2. The MWD and Auxiliary Dam No. 2 will also be used to store water collected from selected sediment dams and runoff from the main infrastructure area, until they are decommissioned and rehabilitated.

The MWD and Auxiliary Dam No. 2 will be retained in the final landform, however, be reduced in size. A decommissioning strategy for the DCM mine water dams is provided in the DCM Mine Closure Plan and Schedule. Auxiliary Dam No. 1 was dewatered with water transferred to the MWD and Auxiliary Dam No. 2.

Rehabilitation Runoff Control

The top surface of the Waste Emplacement will be designed as an extension of Tombstone Hill and will generally drain towards the south to Coal Shaft Creek. In the northern portion of the Waste Emplacement, drainage from the eastern batter of the Waste Emplacement will drain eastwards towards Mammy Johnsons River. Rock lined channels will be installed along the edge of the top surface to provide a stable means for surface water runoff to drain from the top of the waste rock emplacement.

On the batters of the waste rock emplacement, surface water runoff will flow perpendicularly down the slope to the toe of each batter where it will be re-directed by contour drains to drain-off points. The contour drains will be grass-lined, and wherever practicable, will discharge to the natural ground surface. If required as a contingency measure, hydraulic control structures will be constructed to allow water to be safely discharged down the emplacement batter slope to the existing ground level.

Sediment dams downstream of the waste emplacements will be maintained until the revegetated surface is stable and the runoff water quality is suitable for release off-site as described in the WAMP.

b. Final Landform Construction: General Requirements

Final landform construction details are provided in the DCM Mine Closure Plan and Schedule (Appendix 1). The rehabilitation objectives for the final landforms requires final landform designs which sustain the mining domain for the final land use. Final landforms are to be consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post-mining landscape. Final landforms are to be geotechnically stable and incorporate design relief patterns and principles consistent with natural drainage.

The final landform will consist of integrated in-pit and out-of-pit waste emplacements. The maximum height of the Waste Emplacement will be approximately 135 m AHD (i.e. similar scale to the existing Tombstone Hill) and include visible relief patterns and principles which are consistent with natural drainage, where practicable.

The majority of the upper surface of the Waste Emplacement will be rehabilitated to native ecosystem following landform establishment, as shown on Plan 1.

The closure concept and rehabilitation strategy for the Waste Emplacement involves reshaping of the waste material to maximise stability and reduce erosion, spreading of soil substrates where required, revegetation and ongoing monitoring and management.

The outer batters of the waste emplacements will be constructed to a maximum gradient of approximately 1 V:4 H with lesser gradients designed where practicable.

Drainage on the outer waste emplacement batters will be facilitated via contour benches and drains with a longitudinal grade of 1 per cent (%) flattening to 0.6 %. No large rocks will be placed on waste emplacement slopes to minimise the potential of erosion downslope.

General rehabilitation principles will be applied to reduce the risk of erosion on rehabilitated batters (e.g. profiling free-draining landforms generally consistent with the surrounding topography).

The revised DCM Rehabilitation Objectives and Rehabilitation Completion Criteria (Section 4 of this RMP) includes requirements for landform erosion modelling to demonstrate the creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements.

As outlined in the Mine Closure Plan and Schedule (Appendix 1), a review of the application of erosion modelling will be undertaken mid-2022. This review will identify landforms on the site that represent typical sites and recommend erosion modelling for these locations to demonstrate that the current design criteria are appropriate. In addition to the representative sites the erosion model will be applied on sites that are considered high risk across the site. Erosion modelling data will be used to fine-tune final site rehabilitation and be documented in subsequent revisions of this RMP.

c. *Final Landform Construction: Reject Emplacement Areas and Tailings Dams*

During the life of the DCM, no rejects of tailings material has been generated or stored at the DCM.

d. *Final Landform Construction: Final Voids, Highwalls and Low Walls*

The DCM final landform will include partially backfilled final voids located at the Weismantel Pit and Clareval Pit. The open pits will be progressively backfilled with waste rock as the open pit is developed, with a final void remaining to the north. The integrated final landform comprises the above mentioned final voids, and the rehabilitated backfilled open pits integrated with rehabilitated out-of-pit waste rock emplacements.

DCPL is required to rehabilitate the final void to ensure the landform is safe, stable and non-polluting. The final void design aims to minimise the overall extent of the final void as much as is reasonably feasible and within the Project Approval (PA 08-0203) constraints. The final voids, highwalls and lowwalls are detailed in this RMP (Section 4).

The refined final landform of Clareval and Weismantel Voids is described in the DCM Mine Closure Plan and Schedule (Appendix 1) and depicted in Plan 1 and Plan 2.

Following the completion of mining activities at the DCM, it will be expected that the Clareval Final Void and Weismantel Final Void will continue to fill until an equilibrium level is reached.

The final voids will be surrounded by native ecosystem vegetation.

Void access restrictions (i.e. perimeter bunding and/or fencing) would be installed around the final voids where appropriate to ensure public safety and the exclusion of stock

e. Construction of Creek / River Diversion Works

Coal Shaft Creek Reconstruction

In accordance with 29(b), Schedule 3 of Project Approval (08_0203), the current proposed design for the post-mining alignment of Coal Shaft Creek has been prepared and is described in the DCM Mine Closure Plan and Schedule (Appendix 1).

6.2.4 Growth Medium Development

Topsoil Management and Spreading

The site topsoil balance is updated annually to track the usage of topsoil and ensure adequate resources are available for rehabilitation. Topsoil will be applied to the reshaped surface in an even layer approximately 100 mm to 150 mm.

The latest topsoil balance was updated in June 2021. The topsoil balance confirmed sufficient topsoil was held in various stockpiles to complete the required rehabilitation of the DCM.

Topsoil management measures will be implemented during the rehandling and spreading process to ensure the integrated of the topsoil resources is maintained.

Ground preparation for Seeding/Planting

Ground preparation of the waste rock, subsoil and topsoil medium is undertaken in preparation for seeding/planting. Ground preparation for seeding/planting involves:

- Final grading of the waste rock emplacement.
- Survey confirmation that the final landform design has been achieved.

- Ripping and rock raking to ensure large rocks are removed prior to topsoil spreading. Ripping is undertaken along the contour.
- Spreading of topsoil to approximately 100-150mm thickness.
- Soil testing and amelioration if required.
- Ploughing of topsoil prior to seeding.

Weed Management

Weed management at the DCM is undertaken in accordance with the DCM BMP. General weed management measures conducted at the DCM are described in Section 6.2.1b of this RMP.

6.2.5 Ecosystem and Land Use Establishment

The rehabilitation strategy includes establishment of final land uses of agricultural – grazing and native ecosystem areas. Pasture and native vegetation communities may be established by methods described below.

Pasture Establishment

The establishment of improved pasture is an important component of the progressive rehabilitation programme at the DCM. Pasture seed utilised for areas of final land use of grazing will consist of a mix based on species successful in previous sowings, seasonal availability and external agronomic advice. This typically includes a mix of annual and perennial grasses consisting of both native and exotic species.

The selection of pasture species and varieties, fertilisers/ameliorants and application rates, and stocking rates will be influenced by experience at the DCM and the nearby SMC.

Native Ecosystem Establishment

The native tree and shrub seed mixes for the native ecosystem areas generally includes a selection of the framework species for the representative vegetation communities as shown on Figure 5. Species pallets are also provided in the BMP.

The target vegetation communities are representative of the pre-mining vegetation communities or the surrounding vegetation communities and are based on the vegetation mapping undertaken for the EA 2010 and EA 2014.

Overview of Methodologies That May Be Applied as Part of the Revegetation Process

The following actions are implemented in preparation for rehabilitation activities:

- Identify the appropriate vegetation community and species mix for either native ecosystem or pasture rehabilitation. Reference to species pallets in and vegetation mapping in the BMP.
- Seeding rate – Determine the appropriate seeding rate and calculate seed required.
- Seed collection/purchase and tubestock supply.
- Soil preparation techniques have been implemented in advance of seeding/planting.
- Seeding/planting techniques – appropriate method for seeding/planting has been determined.
- Seasonal considerations have been addressed – preferred seeding times.

Seed Collection/Purchase and Tubestock Supply

A key aim of seed collection is to collect where available, local provenance seed stock for propagation purposes. Seed collection for the rehabilitation areas will continue to be undertaken in the short to medium-term. Despite the cessation of vegetation clearance activities and the Vegetation Clearance Protocol after the cessation of mining operations on 31 December 2021, seed collection from vegetation within the Biodiversity Offset Areas will continue to be undertaken as required to collect local provenance seed stock for propagation purposes.

Where seed is not available on-site, suitable seed will be sourced externally.

Seed collection is described in the BMP.

Direct and Broadcast Seeding

Application of seed by hand or machinery will follow preparation of the surface which may consist of scarification and ameliorates to allow successful establishment of applied seed. Seasonal considerations (e.g. drought conditions or excessive heat) will be factored into the process to optimise conditions to support the initial establishment of the target vegetation. Generally, seeding should occur early in spring or autumn to enable sown seed to take advantage of soil warmth. Validation of direct seeding will occur via the Inspection and Test Plan (ITP) – *Ecosystem and Land Use Establishment – Seeding/Planting and Finishing*.

The native tree and shrub seed mixes for Final Land Use Domain B – Native Ecosystem rehabilitation areas generally includes a selection of the same species for the representative vegetation communities. Species pallets are provided in the BMP.

Pasture seed utilised for Final Land Use Domain A – Agricultural – Grazing rehabilitation areas will consist of a mix based on species successful in previous sowings, seasonal availability and external advice.

Installation of tubestock for the target vegetation is described in the DCM BMP.

Weed Management and Pest Animal Control to Protect Juvenile Vegetation

Weed and pest management has been implemented across the lifespan of DCM as implemented by DCPL. Weed management at the DCM is described in Section 6.2.1b.

6.2.6 Ecosystem and Land Use Development

At the ecosystem and land use development phase, rehabilitation monitoring results would be used to confirm rehabilitation areas are on a trajectory towards a self-sustaining ecosystem and meeting the rehabilitation completion criteria. Monitoring results would also be used to determine the recommendations and requirements for maintenance and/or contingency measures (e.g. supplementary plantings, weed control and erosion repair) to improve rehabilitation performance. The Rehabilitation Monitoring Program implemented at the DCM is described in Section 8.

Weed and Feral Animal Control of Rehabilitation Areas

Regular feral animal and weed control is undertaken over the entire DCM area and will continue into closure as described in Section 6.2.1c and in the BMP.

Native Vegetation Rehabilitation Management and Agricultural Monitoring

Rehabilitation monitoring has been established for the grazing areas and native ecosystem areas of rehabilitation (Plan 1).

Rehabilitation monitoring for the native vegetation and grazing areas includes a combination of visual monitoring and Ecosystem Function Analysis (EFA) monitoring. These monitoring methods are described in the Rehabilitation Monitoring Program (Section 8).

6.3 REHABILITATION OF AREAS AFFECTED BY SUBSIDENCE

The DCM is an open cut mine and has no areas affected by underground mining subsidence.

7 REHABILITATION QUALITY ASSURANCE PROCESS

A Rehabilitation Quality Assurance Process will be implemented which details the key actions and/or processes nominated for each rehabilitation phase to ensure that:

- Rehabilitation is implemented in accordance with the nominated methodologies and designs.
- Identified risks to rehabilitation are adequately addressed before proceeding to the next phase of rehabilitation.
- Rehabilitation is completed to the standard required to achieve the applicable completion criteria.

The Rehabilitation Quality Assurance Process will measure how the requirements of this RMP have been met and will document the rehabilitation evidence used for assessing against the completion criteria. The Rehabilitation Quality Assurance Process will be integrated into day to day operations at the DCM and implemented throughout the life of the operation, including into closure until rehabilitation relinquishment has been achieved. The Rehabilitation Quality Assurance Process is outlined in Table 10. Rehabilitation validation monitoring is undertaken as described in Section 8.

Table 10:
Rehabilitation Quality Assurance Processes

Rehabilitation Phase	Asset/Domain	Quality Assurance Actions and Processes	Responsibilities for Implementation	Method for Documenting and Recording Process
Active Mining	N/A	N/A	N/A	N/A
Decommissioning	All Mining Domains	• ITP – Decommissioning. • Infrastructure Decommissioning and Demolition Strategy. • Contaminated Lands Assessment. • Hazardous Materials Assessment.	Operations Manager. Suitably qualified persons.	• ITP. • Inspections and documentation. • Validation Reports. • Annual Review. • Annual Rehabilitation Report and Forward Program.
	Domain 1 Infrastructure Area – Infrastructure Decommissioning	• Infrastructure Decommissioning and Demolition Strategy. • ITP – Decommissioning. • Inspections and demolition reports.	Operations Manager. Suitably qualified persons.	• ITP. • Demolition Reports. • Inspections and documentation.
	Domain 3 Water Management Areas – Mine Water Dam Decommissioning	• Mine Water Dam Decommissioning Strategy. • Engineers Dam Decommissioning Report. • Verification in consultation with Dams Safety NSW. • Dam Safety NSW Signoff. • Visual monitoring.	Operations Manager. Suitably qualified persons/engineers.	• Inspections and documentation. • Validation Reports.
	Domain 3 Water Management Areas – Coal Shaft Creek Reconstruction	• Coal Shaft Creek Reconstruction Plan (described in the DCM WAMP).	Operations Manager. Suitably qualified persons/engineers.	• Inspections and documentation. • Validation Reports.
	Domain 3 Water Management Areas – Water Infrastructure Decommissioning	• Post-mining water management system described in DCM WAMP. • Hydraulic and hydrologically modelling. • Retained water infrastructure has been assessed by a qualify expert.	Environment and Community Superintendent. Suitably qualified persons.	• Monitoring reports. • Modelling reports. • Validation Reports. • Annual Review.

Table 10 (Continued):
Rehabilitation Quality Assurance Processes

Rehabilitation Phase	Asset/Domain	Quality Assurance Actions and Processes	Responsibilities for Implementation	Method for Documenting and Recording Process
Decommissioning (Continued)	Domain 4 Overburden Emplacement Area – Spontaneous Combustion Management	• ITP – PAF and Spontaneous Combustion Management. • Monitoring and assessment of Spontaneous combustion in the final landform.	Mine Planning Superintendent. Suitably qualified persons.	• ITP. • Monitoring Reports. • Inspections and documentation.
	Domain 4 Overburden Emplacement Area – PAF Management	• ITP – PAF and Spontaneous Combustion Management. • Survey and as-built construction report for PAF cell. • Survey of PAF placement. • Groundwater and surface water monitoring as per the DCM WAMP.	Mine Planning Superintendent. Suitably qualified persons.	• ITP. • Survey. • Monitoring Reports. • Inspections and documentation.
	Domain 5 Active Mining Area (Open Cut Void)	• Evidence of sign-off by DCM Operations Manager (or delegate) that security measures (bunding, fencing and/or signage) installed and recommendations of risk assessment satisfied.	Operations Manager. Suitably qualified persons/engineers.	• Validation Reports.
Landform Establishment	All Final Land Use Domains	• ITP – Landform Establishment. • Final landform topographic survey. • Landform erosion modelling. • Surface water quality monitoring. • Groundwater quality monitoring. • Erosion and sediment control monitoring. • Spontaneous combustion monitoring. • Photographic monitoring of rehabilitated landforms. • Visual monitoring.	Mine Planning Superintendent. Surveyor. Suitably qualified persons.	• ITP. • Survey. • Monitoring reports. • Inspections and documentation. • Validation Reports. • Annual Review. • Annual Rehabilitation Report and Forward Program.

Table 10 (Continued):
Rehabilitation Quality Assurance Processes

Rehabilitation Phase	Asset/Domain	Quality Assurance Actions and Processes	Responsibilities for Implementation	Method for Documenting and Recording Process
Landform Establishment (Continued)	Domain F Water Management Areas – Coal Shaft Creek Reconstruction	• Coal Shaft Creek Reconstruction Plan (described in the DCM WAMP).	Operations Manager. Suitably qualified persons/engineers.	• Inspections and documentation. • Validation Reports.
	Domain J Final Void	• Landform survey. • A Landform Assessment by a qualified expert undertaken to confirm that the areas are consistent with the Final Landform and Rehabilitation Plan. • Geotechnical Assessment. • Geochemical Assessment. • Independent engineering slope failure mode analysis and report. • Predictive postmining groundwater model. • Final void water balance. • Hydrological Modelling.	Mine Planning Superintendent. Surveyor. Suitably qualified persons.	• Validation Reports. • Survey. • Inspections and documentation.
Growth Medium Development	All Final Land Use Domains	• ITP - Growth Medium Development – Ground Preparations and Topsoil Spreading. • Supervision of topsoil spreading. • Visual and Photographic monitoring. • Tracking and review of topsoil balance. • Soil chemistry analysis. • Erosion and sediment control monitoring.	Environment and Community Superintendent. Suitably qualified persons.	• ITP. • Inspections and documentation. • Validation Reports. • Annual Review. • Annual Rehabilitation Report and Forward Program.

Table 10 (Continued):
Rehabilitation Quality Assurance Processes

Rehabilitation Phase	Asset/Domain	Quality Assurance Actions and Processes	Responsibilities for Implementation	Method for Documenting and Recording Process
Ecosystem and Land Use Establishment	Domain A Native Ecosystem	• ITP - Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • EFA Assessment: – LFA. – Vegetation Dynamics Modelling. – Habitat Complexity Monitoring. • Surface water quality monitoring. • Groundwater quality monitoring. • Visual and Photographic monitoring.	Environment and Community Superintendent. Suitably qualified persons.	• ITP. • Monitoring reports. • Inspections and documentation. • Annual Review. • Annual Rehabilitation Report and Forward Program.
	Domain B Agriculture – Grazing	• ITP - Ecosystem/Land Use Establishment – Seeding/Planting and Finishing. • LFA Assessment. • Surface water quality monitoring. • Groundwater quality monitoring. • Visual and Photographic monitoring.	Environment and Community Superintendent. Suitably qualified persons.	• ITP. • Monitoring Reports. • Inspections and documentation. • Annual Review. • Annual Rehabilitation Report and Forward Program.
Ecosystem and Land Use Development	Domain A Native Ecosystem Areas	• Water quality monitoring as per the DCM WAMP. • Visual monitoring. • Photographic monitoring. • EFA Assessment: – LFA. – Vegetation Dynamics Modelling. • Habitat Complexity Monitoring.	Environment and Community Superintendent. Suitably qualified persons.	• Monitoring reports. • Inspections and documentation. • Validation Reports. • Annual Review. • Annual Rehabilitation Report and Forward Program.

Table 10 (Continued):
Rehabilitation Quality Assurance Processes

Rehabilitation Phase	Asset/Domain	Quality Assurance Actions and Processes	Responsibilities for Implementation	Method for Documenting and Recording Process
Ecosystem and Land Use Development (Continued)	Domain B Agriculture – Grazing Areas	• Agronomic Assessment of land capability and agricultural suitability classification. • LFA Assessment. • Water quality monitoring as per the DCM WAMP. • Visual monitoring. • Photographic monitoring.	Environment and Community Superintendent. Suitably qualified persons.	• Monitoring reports. • Inspections and documentation. • Validation Reports. • Annual Review. • Annual Rehabilitation Report and Forward Program.
	Domain F Water Management Areas – Coal Shaft Creek Reconstruction	• Coal Shaft Creek Reconstruction Plan (described in the DCM WAMP). • As built construction report and verification by suitably qualified engineer. • Monitoring of Coal Shaft Creek.	Operations Manager. Suitably qualified persons/engineers.	• Inspections and documentation. • Validation Reports. • Monitoring data.
	Domain G Water Storage (Excluding Final Void)	• Mine Water Dam Decommissioning Strategy. • Independent report, water quality monitoring reports. • Visual monitoring.	Operations Manager. Suitably qualified persons.	• Monitoring reports. • Validation Reports. • Annual Review.
	Domain J Final Void	• Final void water level monitoring. • Independent report, water quality monitoring reports. • Independent Hydro-Geological Assessment report, monitoring reports.	Environment and Community Superintendent. Suitably qualified persons.	• Monitoring reports. • Validation Reports. • Annual Review.

8 REHABILITATION MONITORING PROGRAM

Monitoring of the DCM rehabilitation areas is conducted in accordance with the following sections. Rehabilitation is monitored on a regular basis to ensure vegetation is establishing in the rehabilitation areas and to determine the need for any maintenance and/or contingency measures (e.g. supplementary plantings, weed or erosion control). The monitoring also aims to demonstrate the effectiveness of the rehabilitation techniques and track the progression towards achieving the rehabilitation completion criteria (Section 4).

The Annual Rehabilitation Monitoring Program includes the areas designated for agricultural (grazing) and native ecosystem final land uses.

8.1 ANALOGUE SITE BASELINE MONITORING

DCPL has established analogue sites and conducted baseline monitoring which has guided the development of rehabilitation completion criteria for approval by the Secretary. Analogue monitoring continues to be undertaken with the EFA and LFA programs for the native ecosystem areas (Section 8.1) and agricultural areas (Section 8.2).

Rehabilitation areas at the DCM have been assessed and compared against analogue sites established as part of previous monitoring efforts. The *Duralie Coal Mine Rehabilitation EFA Monitoring 2021* report prepared by Kleinfelder (2021) was the seventh annual survey of DCM rehabilitation areas undertaken to assess rehabilitation progress against performance and completion criteria specific to the DCM. Using EFA, the survey provided indicators of rehabilitation success and assessment of landscape processes.

It was determined by Kleinfelder (2021) that rehabilitation at the DCM continues to be on track for successful re-establishment of pasture and native ecosystem with LFA indices suggesting analogue values have either been achieved or are on track to be achieved. A copy of the *Duralie Coal Mine Rehabilitation EFA Monitoring 2021* prepared by Kleinfelder (2021) is provided in Appendix 9 of the 2021 DCM Annual Review (DCPL, 2021).

8.2 REHABILITATION ESTABLISHMENT MONITORING

Native Ecosystem Rehabilitation Establishment Monitoring

Visual Monitoring

Rehabilitation monitoring includes a visual assessment, comprising:

- monitoring of soil erosion status and the effectiveness of erosion control methods;
- observing drains to determine whether substantial silting of inverts and/or any localised failure of the drain embankment has occurred;
- assessing germination success and vegetation establishment (diversity and abundance);
- usage of habitat enhancement features;
- evaluating the behaviour of placed topsoil;
- evaluating threats posed to rehabilitated areas posed by weed infestation and feral animals; and
- opportunistic fauna observations.

Visual monitoring of rehabilitation areas provides an early identification of areas requiring remedial planting or other maintenance works to maintain rehabilitation progress. Annual surveys of select revegetation areas will be undertaken by an appropriately qualified and experienced person to review the success of rehabilitation and identify any additional measures required to achieve ongoing rehabilitation success.

Ecosystem Function Analysis Monitoring

In-depth monitoring and assessment of the quality and ecological value of native ecosystem rehabilitation will be required prior to lease relinquishment. This assessment will be conducted using EFA. EFA aims to measure the progression of rehabilitation areas towards self-sustaining ecosystems. EFA has been incorporated into the overall DCM Rehabilitation Monitoring Program to provide an assessment of ecosystem functionality.

EFA monitoring is comprised of the following components:

- LFA;
- vegetation dynamics; and
- habitat complexity.

EFA Analogue Transects have been established in proximal areas to the DCM which represent the varying landscapes (i.e. slopes and aspects) and target communities planned for each rehabilitation area.

In December 2012, a fixed transect-based LFA, vegetation dynamics and habitat complexity monitoring program was established across rehabilitation areas at the DCM. As rehabilitation progresses, EFA revegetation transects will be established at the DCM in each of the rehabilitation domain areas.

Rehabilitation transects were assessed again in June 2021 as part of the seventh annual round of monitoring. A summary of the findings from *Duralie Coal Mine Rehabilitation EFA Monitoring 2021* report prepared by Kleinfelder (2021) (Appendix 9 of the DCM Annual Review [DCPL, 2021]) is provided in Section 8.1.

DCPL will continue to undertake annual EFA monitoring at the DCM.

As rehabilitation progresses, additional EFA Revegetation Transects will be established at the DCM in each of the rehabilitation domain areas. The location of each transect will be determined on the basis of representative slope, aspect and target vegetation community in consultation with a suitably qualified specialist.

The representativeness of the EFA transects are reviewed during each monitoring round to confirm that transects continue to accurately represent the status of rehabilitation across each of the rehabilitation domains.

The results of LFA, vegetation dynamics and habitat complexity monitoring (i.e. EFA) are used at the DCM to monitor progress towards rehabilitation completion criteria (Section 4) and to determine a trajectory towards self-sustaining ecosystems.

A detailed monitoring report will continue to be prepared annually, including a summary of previous monitoring results, results of the current year's monitoring and any planned remedial works, if required. The monitoring results are summarised in the DCM Annual Review which is made available on the DCM website.

Fauna Monitoring

Fauna usage of the native ecosystem rehabilitation areas is monitored and documented over time. Fauna monitoring is conducted every three years to assess the success of the rehabilitation and revegetation activities in providing habitat for a range of vertebrate fauna. The surveys include an assessment of habitat complexity, species richness and abundance.

Recent fauna surveys conducted over the DCM rehabilitation areas and Biodiversity Offset Areas indicate that these areas provide habitat for a range of native vertebrate fauna, including birds, mammals, reptiles and frogs.

Agricultural Rehabilitation Establishment Monitoring

Rehabilitation monitoring has commenced for the rehabilitation areas proposed as pasture for agricultural grazing. The areas of the DCM final landform targeted for future agricultural pursuits will be rehabilitated with pasture species (e.g. areas of the Waste Emplacement) and are proposed for Class 4 Agricultural Suitability. Class 4 Agricultural Suitability is defined as (NSW Agriculture, 2002):

> *Land suitable for grazing but not for cultivation. Agriculture is based on native pastures and improved pastures established using minimum tillage techniques. Production may be seasonally high but the overall production level is low as a result of major environmental constraints.*

Monitoring of agricultural rehabilitation areas will involve monitoring of LFA indices, including stability, infiltration and nutrient cycling indices.

Completion criteria for these areas will also be assessed by undertaking an assessment of the Agricultural Suitability class by a suitably qualified specialist or agronomist.

Other Rehabilitation Monitoring

PAF Material Monitoring

As described in Section 6.2.1, the SWMP includes a PAF Material Management Plan.

The PAF Material Management Plan includes routine monitoring to provide checks on materials management and effects of acid rock drainage (ARD). Monitoring includes (Environmental Geochemistry International Pty Ltd, 2009):

- confirmation of the long-term placement of PAF material;
- water quality monitoring of seepage and runoff from pit surfaces and waste rock dumps to check for ARD generation, to assess the performance of management strategies, and to determine and/or refine limestone treatment requirements; and
- routine site water quality monitoring including pH, electrical conductivity, acidity/alkalinity, sulphate, Aluminium, Copper, Iron, Manganese, Nickel, Zinc and storage volumes and flows to monitor the performance of the ARD control program.

Rehabilitated area surface water runoff performance indicators and completion criteria have been established in Section 9 of the SWMP. The SWMP will be used to assess progress against the completion criteria.

DCPL will continue to monitor the water quality of contained water storages (i.e. pH and solute concentrations) during the life of the DCM as part of the existing Surface Water Monitoring Program. In the event ARD is identified through the Surface Water Monitoring Program, specific acid rock drainage controls will be implemented.

Surface Water Monitoring

DCPL monitors surface water quality by sampling from monitoring locations in and surrounding the mine site. These locations comprise both streams and water storage structures. Surface water is sampled and analysed on a monthly and event basis, or following a sediment dam spill. Collected waters are analysed for a suite of physical and chemical parameters and the results are reported in the Annual Review along with a comparison to a number of performance indicators and measures.

Surface water monitoring is described in the SWMP. This surface water monitoring will continue to be conducted to confirm that rehabilitated areas are progressing satisfactorily to a final landform which is non-polluting and not adversely affecting off-site water quality.

Groundwater Monitoring

Groundwater monitoring is undertaken at a suite of monitoring bores located in and around the DCM area. Groundwater monitoring, water level measurements and sample collection, storage and transportation are undertaken in accordance with the procedures outlined in the Murray Darling Basin Groundwater Quality Sampling Guidelines (Murray Darling Basin Commission, 1997). Monitoring is undertaken on a quarterly basis. Monitoring results are reported in the Annual Review along with a comparison to relevant performance indicators.

A site water balance review is undertaken on an annual basis to monitor the status of inflows (including groundwater inflows to open pits), storage and consumption of final voids. The site water balance review is used to optimise water management performance and enables corrective actions to be implemented, if required. The results of the water balance reviews are reported in the Annual Review.

Groundwater monitoring is described in the Groundwater Management Plan (GWMP) and will continue to be conducted at the DCM to confirm that rehabilitation areas are progressing appropriately towards free draining and non-polluting landforms and not adversely affecting off-site water quality or receiving environments.

Erosion and Sediment Control Monitoring

All sediment dams are monitored on a minimum quarterly basis or following receipt of sufficient rain whereby such dams have the potential to spill. Maintenance activities are undertaken on sediment dams as required. Sediment dams are cleaned out when the storage volume is reduced by sediment deposition (i.e. when 30 % of storage volume is lost to sediment build up) and inspected after major rainfall events. All overflows and controlled discharges from sediment dams are sampled and analysed.

Areas under rehabilitation are stabilised by structural controls such as bench drains and contour banks (as required), to break up effective slope length exposed to erosion.

All rehabilitation areas are assessed regularly via visual monitoring of soil erosion status and the effectiveness of erosion control methods. The visual monitoring identifies any areas of active erosion occurring in the rehabilitation areas and remedial works are undertaken where required.

Spontaneous Combustion Monitoring

As described in Section 6.2.1, the DCM's Spontaneous Combustion Management Plan outlines measures to control potentially spontaneously combustible material and includes monitoring, encapsulation and extinguishment measures.

Spontaneous combustion monitoring will continue to be undertaken at the DCM in relevant domains to identify materials with the potential to spontaneously combust. Following identification, DCPL will undertake appropriate remediation work and mitigation measures.

8.3 MEASURING PERFORMANCE AGAINST REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

Rehabilitation performance will be assessed in discrete areas/polygons based on the age and type of rehabilitation. The results of rehabilitation monitoring will be compared against the completion criteria described in Section 4.1 to track rehabilitation progress. Outcomes of the rehabilitation monitoring will be provided in subsequent Annual Reviews, and the Annual Rehabilitation Report and Forward Program.

Summaries of the monitoring results and performance against rehabilitation objectives and completion criteria will be included in this section when this RMP is updated or revised.

9 REHABILITATION RESEARCH, MODELLING AND TRIALS

DCPL has extensive experience in both native ecosystem rehabilitation and agricultural pasture (agricultural – grazing) rehabilitation, with successful rehabilitation areas completed over the past 20 years at both the DCM and SMC mine sites. Learnings from the rehabilitation works undertaken on-site to date, along with industry best practice guidelines are employed in the methodology for new rehabilitation areas.

9.1 CURRENT REHABILITATION RESEARCH, MODELLING AND TRIALS

No active rehabilitation research, modelling or trials are undertaken at the DCM. Learnings from rehabilitation works undertaken at both the DCM and SMC will continue to guide rehabilitation at the DCM for new rehabilitation areas.

9.2 FUTURE REHABILITATION RESEARCH, MODELLING AND TRIALS

As per Section 1.1.3 of this RMP, rehabilitation at the DCM has occurred progressively during the active mining phase and will continue throughout the mine closure phase, as shown in Plan 3A. These well-established rehabilitation methods have placed the DCM on a trajectory to achieve the rehabilitation outcomes, detailed further in Section 4.

10 INTERVENTION AND ADAPTIVE MANAGEMENT

DCPL has successfully undertaken rehabilitation activities at the DCM (Section 6) with rehabilitation monitoring, studies and trials continuing to inform the effectiveness of rehabilitation methods and requirements for contingency measures.

The 2009 ERA (SP Solutions, 2009), 2017 ERA (HMS, 2017), and 2021 *Closure & Rehabilitation Risk Assessment* (IEMA, 2021) identified potential issues and risks associated with rehabilitation and mine closure at the DCM. A TARP (Table 11) has been developed based on identified threats to rehabilitation at the DCM. Any emerging threats to rehabilitation success will be identified through the ongoing monitoring programs described in Section 9.

Table 11:
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem	Dense cover of exotic grasses (e.g. Kikuyu [*Pennisetum clandestinum*]) in ungrazed woodland areas results in suppression of native grasses/shrubs/trees.	Rehabilitation monitoring indicates low species diversity and dominance of exotic grasses.	• Discontinued use of Kikuyu/remove from seed mix. • Increase number of native grass species in seed mix. • Re-seed relevant areas with native grass species (i.e. Kangaroo Grass [*Themeda australis*]).	• Rehabilitation monitoring reports and recommendations. • This RMP.	Regular visual inspection of rehabilitation areas and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
Domain B Agricultural - Grazing	Erosion on steep slopes (e.g. outer batters of waste emplacements) due to overgrazing of pasture or damage from stock.	Rehabilitation monitoring indicates active erosion on outer batters.	• Exclude stock and remediate eroded area. • Rest remediated area from continuous grazing to improve long-term stability of the area.	• Rehabilitation monitoring reports and recommendations. • This RMP. • Successful implementation of Action/Response at the DCM.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
	Continuous grazing on areas revegetated with pasture results in low density, depth and cover of pasture grass, increasing erosion potential (particularly on steep batters of waste emplacement areas or other landforms).	Rehabilitation monitoring indicates active erosion and poor revegetation cover.	• Modify grazing regime to include rest periods.	• Rehabilitation monitoring reports and recommendations. • This RMP. • Successful implementation of Action/Response at the DCM.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing	Direct-seeding of Eucalypt species is an ineffective method to achieve long-term development of resilient Eucalypt trees.	Rehabilitation monitoring indicates poor/slow growth and development of Eucalypt trees.	• Revegetation methods to include both direct-seeding and planting of tubestock (particularly for Eucalypt tree species).	• Rehabilitation monitoring reports and recommendations. • This RMP.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
	Species diversity and/or density in rehabilitation areas do not correspond with target community/reference site(s).	During ecosystem establishment and sustainability phase, monitoring indicates that species diversity and/or density in some areas does not correspond with reference site(s).	• Conduct additional plantings or further actions following planting such as application of fertiliser or watering of rehabilitation areas. • Obtain expert opinions if required.	• Rehabilitation monitoring reports and recommendations. • This RMP.	Regular visual inspection of rehabilitation area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
	Severe drought results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates revegetation species failure as a result of drought conditions.	• Species selection consistent with species native to area. • Monitoring of rehabilitation following any prolonged dry periods and watering and/or replanting of seeds as necessary.	• Successful implementation of Action/Response at the DCM.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing (Continued)	Inadequate weed and pest animal control results in failure of rehabilitation area.	Rehabilitation monitoring indicates revegetation failure due to significant weed infestation and/or pest animals.	• Implement targeted weed control or pest animal control in accordance with BMP. • Educate relevant staff in identification of potential weed species, and in vehicle inspection/wash down procedures to minimise weed transport. • Conduct follow-up site inspections to determine the effectiveness of weed control.	• This RMP and BMP.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
	Flooding results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates significant dieback/erosion in rehabilitation area as a result of flooding and loss of revegetation.	• Design final landforms (e.g. slopes), structures to minimise impacts from heavy rainfall/flooding. • Monitoring of rehabilitation areas following any major rainfall event and re-stabilisation of any landforms and/or replanting of seeds as necessary.	• WAMP. • Successful implementation of Action/Response at the DCM.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.
	Fire results in loss of vegetation and failure of rehabilitation area.	Occurrence of bushfire in rehabilitation area results in loss of revegetation.	• Species selection consistent with species native to area that are fire-tolerant. • Implementation of fire prevention measures in rehabilitation area and surrounds.	• BMP. • Successful implementation of Action/Response at the DCM.	Regular visual inspection of remediated area and ongoing rehabilitation monitoring using EFA methodology.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing (Continued)	Exploration activities results in loss of vegetation and failure of rehabilitation area.	Rehabilitation monitoring indicates revegetation is damaged resulting in failure of rehabilitation area.	• Implement relevant impact avoidance measures in accordance with approved Surface Development Notice (SDN) or Review of Environmental Factors (REF), BMP and this RMP. • Monitoring of rehabilitation areas following exploration and replanting of seeds as necessary.	• SDN. • REF. • BMP. • This RMP. • Successful implementation of Action/Response at the DCM.	Visual inspection of remediated area following exploration activities.	Reporting in Annual Rehabilitation Report.
	Rehabilitation of PAF waste emplacements causing acid mine drainage contamination of surface and groundwater.	Surface water and groundwater monitoring indicates potential acid mine drainage contamination.	• Implement SWMP Contingency Plan (Appendix 2 of WAMP).	• WAMP	Ongoing implementation of SWMP and GWMP monitoring programs.	Reporting in Annual Rehabilitation Report.
	Rehabilitation of in-situ and exposed coal seams causing spontaneous combustion or acid mine drainage contamination of groundwater.	Observed spontaneous combustion event or groundwater monitoring results indicates potential acid mine drainage contamination.	• Prepare detailed final void design. • Review final void water balance. • Review medium to long term water quality predictions for final void.	• 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Final Void (Section 4 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of Spontaneous Combustion Management Plan and GWMP monitoring program.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing (Continued)	Poor quality runoff from rehabilitation areas reaching Mammy Johnsons River.	• Ineffective surface water runoff controls during rehabilitation. • On-site and Mammy Johnsons River surface water monitoring results indicate poor quality water.	• Implement SWMP Contingency Plan. • Review site water balance to ensure it incorporates the final landform design, surface water inflows and outflows to/from final void. • Identify post-closure environmental monitoring requirements.	• SWMP (Rehabilitation Runoff Criteria). • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Site Water Balance (Section 5.1 of the DCM Mine Closure Plan and Schedule [Appendix 1]) and Post-Closure Monitoring and Maintenance Program (Section 11 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of SWMP monitoring programs during operations and rehabilitation, and Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.
Domain F Water Management Areas	Rainfall/flooding results in failure of permanent Coal Shaft Creek alignment.	• Monitoring indicates failure of permanent Coal Shaft Creek alignment.	• Geotechnically stable design of permanent Coal Shaft Creek alignment to minimise impacts from heavy rainfall/flooding. • Monitoring of permanent Coal Shaft Creek alignment following any major rainfall event and re-stabilisation of any landforms and/or replanting seeds as necessary.	• WAMP. • CSCMP monitoring program.	Regular visual inspection of permanent Coal Shaft Creek alignment.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing **Domain F** Water Management Areas	Unplanned release of mine water during rehabilitation.	• Current water management practices on-site are less than adequate for rehabilitation stage of operations. • Less than adequate surface and ground water controls for rehabilitation stage of operations. • Uncontrolled spill from MWD or auxiliary dams to Mammy Johnsons River. • Unexpected structural failure of dam.	*Existing Controls* • WAMP. • Dedicated resources on site. • Prescribed Dam Maintenance Plan. • Current water infrastructure in place. • Site water balance. *Further Risk Reduction Actions* • Review and update existing management plans for rehabilitation stage of operations. • Prepare a strategy for transferring mine water from the prescribed dams back to the final voids. • Prepare strategy for decommissioning mine water dams or integration with final land use.	• 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Environmental Management Plans (Section 12 of the DCM Mine Closure Plan and Schedule [Appendix 1]), Retained Water Infrastructure (Section 5.3 of the DCM Mine Closure Plan and Schedule [Appendix 1]) and Mine Water Dam Decommissioning Strategy (Section 9 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of SWMP monitoring programs during operations and rehabilitation, and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain F Water Management Areas	Failure to meet rehabilitation runoff water quality criteria during rehabilitation and mine closure.	• Less than adequate control of runoff from rehabilitation areas. • Eroding/unstable landform.	*Existing Controls* • WAMP and this RMP. *Further Risk Reduction Actions* • Identify post-closure environmental monitoring requirements.	• 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Post-Closure Monitoring and Maintenance Program (Section 11 of the DCM Mine Closure Plan and Schedule [Appendix 1])	Ongoing implementation of WAMP and RMP monitoring programs during operations and rehabilitation, and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.
Domain F Water Management Areas **Domain G** Water Storage Areas (Excluding Final Void)	Unsustainable water balance during rehabilitation and mine closure.	• Less than adequate water balance model of the final landform design. • Less than adequate design of existing infrastructure.	*Existing Controls* • Site Water Balance Model reviewed annually. • Infrastructure meets needs of existing operating coal mine and will be maintained during rehabilitation. *Further Risk Reduction Actions* • Update site water balance to consider final landform.	• SWMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Site Water Balance (Section 5.1 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of WAMP during operations and rehabilitation and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing **Domain J** Final Void	Geotechnical instability of rehabilitated waste emplacements and final void resulting in a detrimental environmental impact.	• Steepness/instability of final highwalls, endwalls, batters and waste emplacements. • Undetermined water impacts on wall stability and submerged rehabilitated waste emplacements. • Uncontrolled erosion.	*Existing Controls* • Operational geotechnical assessments. • Conceptual final landform design. *Further Risk Reduction Actions* • Undertake a Stability Assessment of all drainage features, water management areas and rehabilitated waste emplacements, to identify any works required to ensure stability in the final landform. • Undertake a Geotechnical Assessment of the final voids to ensure the final landform designs are safe, stable and non-polluting.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Stability Assessment (Section 3 of the DCM Mine Closure Plan and Schedule [Appendix 1]) and Final Void Design and Geotechnical Assessment (Sections 3 and 4 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of WAMP during operations and rehabilitation, and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain J Final Void	Failure of the final void to achieve a criteria of safe, stable and non-polluting.	• Less than adequate water resources to reach the modelled final void water equilibrium. • Less than adequate modelling of long-term final void water quality. • Inability to control access to steep final void slopes.	*Existing Controls* • Perimeter bunding/fencing planned to be established and maintained. • Conceptual final void design. • Final void water balance model. • Predicted final void water quality model. *Further Risk Reduction Actions* • Review site groundwater model to ensure model is consistent with final landform design. • Review medium to long-term water quality predictions of final void against available monitoring data to determine need for additional/alternate management. • Undertake Geotechnical Assessment of final voids to ensure final landform designs are safe, stable and non-polluting. • Identify post-closure environmental monitoring requirements.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Final Void Design and Geotechnical Assessment (Sections 3 and 4 of the DCM Mine Closure Plan and Schedule [Appendix 1]), Final Void Water Balance (Section 4.2 of the DCM Mine Closure Plan and Schedule [Appendix 1]) and Final Void Water Quality (Section 4.3 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of WAMP during operations and rehabilitation, and implement Post Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing **Domain F** Water Management Areas	Erosion of final landforms, compromising establishment of vegetation and water quality.	• Less than adequate design of drainage from landforms/waste emplacement slopes.	*Existing Controls* • Conceptual final landform design. • Demonstrated previous rehabilitation experience. • WAMP and this RMP. *Further Risk Reduction Actions* • Develop detailed final landform design that considers surface water runoff and drainage.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Final Landform Design (Section 3 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of this RMP during operations and rehabilitation and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.
Domain A Native Ecosystem **Domain B** Agricultural – Grazing	Inability to complete rehabilitation to required standard due to insufficient materials (e.g. inert capping material, clay, topsoil).	• Inadequate supply of inert capping material and clay available on-site. • Less than adequate clay for Coal Shaft Creek Diversion reestablishment (clay liner). • Less than adequate topsoil available onsite.	*Existing Controls* • Sufficient NAF for inert capping has been verified. • Topsoil management procedure, including site topsoil balance identifies sufficient topsoil resources for rehabilitation. • Topsoil balance updated annually. • Monitoring and reporting. *Further Risk Reduction Actions* • Quantify availability of rehabilitation resources, particularly clay and review requirements.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Rehabilitation Resources (Section 6 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of this RMP during operations and rehabilitation and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing	Failure to achieve biodiversity targets in rehabilitation areas.	• Inability to integrate rehabilitation with undisturbed land and wildlife corridors. • Human interference. • Impacts on native ecosystems by introduced species. • Poor establishment of vegetation.	*Existing Controls* • BMP. • This RMP. • Demonstrated previous rehabilitation and experience. *Further Risk Reduction Actions* • Identify post-closure environmental monitoring requirements. • Identify post-closure/rehabilitation maintenance requirements.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Post-Closure Monitoring and Maintenance Program (Section 11 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of BMP and this RMP during operations and rehabilitation, and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.
Domain A Native Ecosystem	Infrastructure not suitably decommissioned.	• Decommissioning requirements not adequately identified.	• Identify infrastructure not required to support mine closure and develop decommissioning strategy.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Infrastructure Removal Strategy and Scheduling (Section 8 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Implementation of Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

Table 11 (Continued):
Rehabilitation Trigger Action Response Plan

Final Land Use Domain	Threat to Rehabilitation Success	Trigger/Cause	Action/Response to Mitigate, Remediate and/or Compensate any Identified Impacts	Justification for Action/Response	How Impact will be Monitored	Notification Protocol
Domain A Native Ecosystem **Domain B** Agricultural – Grazing	Rehabilitation activities disturb Aboriginal Heritage sites.	• Rehabilitation activities inadvertently occur outside approved disturbed areas. • Less than adequate delineation of Aboriginal heritage sites. • Previously unidentified Aboriginal heritage sites adjacent to current disturbed area.	• Implement HMP controls, including Preclearance Procedure and Permit Process.	• This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Post-Closure Monitoring and Maintenance Program (Section 11 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of HMP and this RMP during operations and rehabilitation and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.
	Odours emitted from site.	• Less than adequate PAF management and capping. • Less than adequate control during PAF rehandle.	• Implement PAF Material Management Plan procedures.	• PAF Material Management Plan. • This RMP. • 2017 ERA and 2021 *Closure & Rehabilitation Risk Assessment* (Section 3). • DCM Mine Closure Plan and Schedule - Post-Closure Monitoring and Maintenance Program (Section 11 of the DCM Mine Closure Plan and Schedule [Appendix 1]).	Ongoing implementation of PAF Material Management Plan during operations and rehabilitation, and implement Post-Closure Monitoring Program during closure.	Reporting in Annual Rehabilitation Report.

11 REVIEW, REVISION AND IMPLEMENTATION

Review and Revision of this RMP

In accordance with Clause 11, Schedule 8A of the *Mining Regulation 2016*, DCPL will amend this RMP in the following circumstances:

- to substitute the proposed version of the rehabilitation objectives and rehabilitation completion criteria (Section 4) or FLRP (Section 5) with the version approved by the Secretary—within 30 days after the document is approved;
- as a consequence of an amendment made to the rehabilitation objectives and rehabilitation completion criteria (Section 4) or FLRP (Section 5) – within 30 days after the amendment is made;
- to reflect any changes to the risk control measures in the RMP that are identified in a rehabilitation risk assessment – as soon as practicable after the rehabilitation risk assessment is conducted; and
- whenever directed in writing to do so by the Secretary – in accordance with the direction.

DCPL notes that the rehabilitation objectives and FLRP have been approved by the NSW Resources Regulator. Accordingly, this RMP includes the approved versions of the rehabilitation objectives and FLRP, as required by Clause 11, Schedule 8A of the *Mining Regulation 2016.*

DCPL will ensure that the DCM RMP remains current and relevant to ensure it defines the rehabilitation outcomes to be achieved in relation to the mining area and sets out the strategy to achieve those outcomes. This will be partly informed by ensuring that the effectiveness of the rehabilitation risk assessment and controls adopted in the life of mine progressive rehabilitation schedule and rehabilitation phases are routinely evaluated throughout the life cycle of the Project.

Whenever any foreseeable hazard is identified that presents a risk to achieving the rehabilitation objectives and rehabilitation completion criteria, or the FLRP, DCPL will update the rehabilitation risk assessment and RMP.

If necessary, DCPL will update this RMP to include more detailed mine closure activities as rehabilitation progresses. The review and updating of this RMP will include and be informed by (as relevant) the outcomes of any component of the DCM Mine Closure Plan and Schedule (Section 9.1 and Appendix 1) and additional stakeholder consultation. The results of any environmental performance monitoring undertaken during the Forward Program term will also contribute to refining future RMPs.

The rehabilitation principles and targets described in this RMP will continue to be tracked via DCPL's internal review and tracking systems and the reporting and auditing mechanisms.

Annual Review and Annual Rehabilitation Report

In accordance with Condition 3, Schedule 5 of the Project Approval (PA 08_0203), DCPL will prepare an Annual Review prior to the end of September each year (or other timing as may be agreed with the Secretary of the DPE) to review the environmental performance of the DCM. The Annual Review will report on DCPL's compliance with all conditions of the Project Approval (PA 08_0203), DCM's MLs and other relevant environmental approvals and licences.

In addition to addressing the requirements of Condition 3, Schedule 5 of the Project Approval (PA 08_0203), the Annual Review will include:

- a description of rehabilitation activities undertaken during the reporting period and the forecasted rehabilitation activities proposed for the next reporting period;
- a summary of rehabilitation monitoring results and any observations of the effectiveness of the rehabilitation practices and measures;
- a review of the rehabilitation monitoring results against the rehabilitation performance indicators and completion criteria; and
- an update on the mine closure planning process.

In accordance with Condition 10, Schedule 5 of the Project Approval (PA 08_0203), the Annual Review is made publicly available on the Duralie Coal website (www.duraliecoal.com.au).

Implementation of this RMP

A general overview of the responsibility of DCPL personnel in regard to the monitoring, review and implementation of this RMP is provided in Table 12 below.

Table 12:
Site Environmental and Mining Management Relevant to Implementation of this RMP

Management Team Member(s)	Role and Responsibility
Operations Manager	• Provide adequate resourcing to support site environmental management. • Provide strategic direction. • Overall site management responsibility. • Responsible for management of mining contractors and DCPL staff.
Superintendent – Mine Planning	• Responsible for monitoring, review and implementation of planning and engineering aspects of this RMP. • Annual internal auditing and reporting (Annual Review). • Responsible for the performance of activities undertaken within the mining area.
Superintendent – Environment and Community	• Responsible for monitoring, review and implementation of environmental aspects of this RMP. • Environmental related approvals and planning. • Management of the implementation and compliance with Environmental Management Plan, approvals, licensing and permits. • Responsible for site environmental monitoring. • Annual internal auditing and reporting (Annual Review). • Progressive rehabilitation planning, development and reporting. • External government and stakeholder consultation. • Responsible for community enquiry and initiatives management.
General Staff and Contractors	• All general staff members trained in environmental procedures and protocols as part of the induction process and regular site meetings. • All general staff members responsible for immediately reporting environmental incidents. • All general staff members responsible for undertaking works in an environmentally sound manner and in accordance with this RMP. • Environmental Management Plan, and site commitments.

12 REFERENCES

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APPENDIX 1

DURALIE COAL MINE: MINE CLOSURE PLAN AND SCHEDULE

DURALIE COAL MINE
Mine Closure Plan and Schedule

1 MINE CLOSURE PLAN AND SCHEDULE

DCPL is has commenced the mine closure phase and has prepared this Mine Closure Plan in support of the DCM Rehabilitation Management Plan (RMP).

A Mine Closure Planning Program (MCPP) was developed for the DCM and was included in previous versions of the MOP/RMP. The purpose of this MCPP was to provide a strategy and a description of all the works required to develop the Mine Closure Plan for the site. The technical assessments identified in the MCPP have been informed by the key risks and risk reduction strategies associated with rehabilitation and mine closure of the DCM, as identified in the rehabilitation and closure risk assessments.

An update to the Mine Closure Planning Program was prepared in October 2021, as required by notices received under Section 240 of the Mining Act 1992 from the NSW Resources Regulator dated 31 August 2021, which superseded the plan in the previous MOP/RMP. This revision of the MCPP was prepared to expand on and provide a higher level of detail than the MCPP described in the MOP/RMP. It also includes a description of the status of operations at the DCM and the schedule for transition to mine closure.

The majority of the assessments/studies required by the MCPP have been completed progressively during the previous MOP/RMP term. The remaining components of the Program will continue to be developed.

DCPL has prepared a Rehabilitation Management Plan (RMP) consistent with the new standard rehabilitation conditions on mining leases imposed through an amendment to the Regulation under the *Mining Act* 1992. The outcomes of completed components of the Mine Closure Planning Program are described in the subsections below and have informed or been considered in the preparation of the RMP. The RMP will include all relevant information from the detailed mine closure planning process. It is anticipated that work on the internal detailed closure plan will continue beyond 30 June 2022 and relevant outcomes will be included in future revisions of the RMP.

Indicative Mine Closure Schedule

The Life of Mine Rehabilitation Schedule is described in Section 6.1 of the RMP. The progressive rehabilitation schedule is described in the DCM Annual Rehabilitation Report and Forward Program (ARRFP).

An indicative schedule for the key mine closure works at the DCM is provide below:

- General site clean-up (late 2022);
- Commence first stage of decommissioning and demolition of infrastructure (late 2022);
- Continue PAF material rehandling and bulk landform establishment (2023);
- Decommissioning of AD2 Dam (2023);
- Reconstruction of Coal Shaft Creek (2023);
- Ongoing progressive rehabilitation (2023-2024);
- Completion of decommissioning and demolition of infrastructure (2024); and
- Complete rehabilitation (2025).

The MCPP actions/components and completion status/schedule for each component is provided in the table below. Specific detail on individual components of the MCPP and the outcomes of the completed mine closure studies and strategies are described in the following sub-sections.

Table 1
Mine Closure Planning – Action Plan and Schedule

Risk Assessment Actions	Corresponding Landform TAP Actions	Target Completion Date
003: **Development of Completion Criteria** – Undertake a review of the completion criteria as part of the RMP review and incorporate the outcomes of this review in the preparation of the detailed mine closure plan.		30 June 2022 Completed.
004**: Develop the Human Resources Strategy** - Ensure that a representative from HR is involved in the Mine Closure working group so that the HR strategy can be developed in consultation with the working group and aligned to the needs of the closure plan.		Initially by 1 August 2022 with ongoing review and refinement
007: **Mine Closure Stakeholder Strategy** – Develop the Mine Closure Plan Stakeholder Strategy which will include a list of all relevant stakeholders, how they will be engaged with and when. In addition, this should include a consultation log which is a record of the engagement along with any outcomes and actions.		Initially by 30 June 2022 with ongoing review and refinement
009: **Socio-economic Impact Assessment** – Scope and prepare a study that is an assessment of the impact on the local community as a result of closure of the mines. There should be a focus on capacity building to ensure sustainability beyond closure of the mine.		Initially by 31 December 2022 with ongoing review and refinement
019: **Document and Records Control Management System** – Develop an appropriate Document and Records Control Management System to be used during the detailed mine closure planning process. The purpose it to keep all evidence to demonstrate and verify closure objectives have been meet. As part of the setup review the existing records that are relevant to relinquishments so that they can be brought into the systems and the value of this work is not lost.	9	30 June 2022
021: **Monitoring & Maintenance Program** - Prepare a Monitoring and Maintenance Program as part of the Detailed Mine Closure Plan. This should be detailed in the existing Environmental Management Plans. Review the existing monitoring programs and align with and or add elements to specifically address the closure success criteria that are adopted for each CMA. This review should also include a review what elements of the existing monitoring system can cease when mining ceases.		30 June 2022 Completed. Ongoing review and refinement in the EMPs.
023**: Review Environmental Management Plans for closure phase** - Undertake a review of the existing approved EMPs and update them as the site moves into closure. This review will not only include incorporating any aspects that are related to closure, but also removing operational requirements that are no longer applicable when the site is in closure. Consider monitoring and maintenance requirements during and after closure.		Completed. Periodic review and refinement
025: **Approvals/Licences Relinquishment Strategy** – Develop a relinquishment strategy for all relevant approvals, consents, and licences. This is in addition to the tenement requirements.		31 October 2022 with ongoing review and refinement
028: **Public Safety Risk Assessment** - Complete a RA to assess any risks to the public during and post closure of the mine(s)		30 September 2022 with ongoing review and refinement

Table 1 (Continued)
Mine Closure Planning – Action Plan and Schedule

Risk Assessment Actions	Corresponding Landform TAP Actions	Target Completion Date
029: **Develop Mine Closure Risk Register** and undertake periodic risk assessment reviews.		Completed Periodic risk assessment review
033: **Decommissioning & Demolition Plan** - Prepare a Decommissioning & Demolition Plan for the site which includes a list of all infrastructure to be removed, assessment of waste streams and volumes, consideration of hazmat [i.e. asbestos, radiation sources, etc.]. Include a management and maintenance strategy for any assets that are retained. This could include a long-term strategy for the assets.		31 October 2022 with ongoing review and refinement
035: **Exploration inspection program** - Undertake a program to inspect a representative sample of the rehabilitated exploration boreholes sites to gather evidence that the work has been completed to a satisfactory standard.		30 June 2020 Commenced. Continues during closure.
038: **Water Management Infrastructure retention strategy.**	6	31 March 2023
041: **Closure waste management plan** - Develop a strategy to manage the waste streams generated by the demolition of site infrastructure. This is to include identifying a suitable licensed disposal option and the use of appropriately licensed contractors to manage the waste transfer and disposal.		31 October 2022 with ongoing review and refinement
042: **Contaminated Sites Assessment** - Complete a Land Quality Assessment for the site which aims to identify any contaminated sites, undertake intrusive investigations, and prepare Remediation Action Plans for the identified sites.		31 October 2022 (PSI level) Detailed assessment in late 2022.
049: **Review Historical PAF** management practices & compile rehabilitation signoff evidence – Consider targeted investigations where appropriate, draw on site experience, review historical dumping plans and records, and photo records. Develop a data set that can be used in the mine closure plan and ESF2 to demonstrate that the PAF material has been managed appropriately during mining operations.	2	30 June 2023, undertaken during closure execution.
050: **LOM Rehab Materials Register & Mass Balance** - Develop a rehabilitation materials register including topsoil, clay, and rock. Undertake a review of the rehabilitation materials required (e.g. topsoil, rock, clay, etc.) and compare that the material available in stockpile or available to be recovered from the remaining mining areas.		30 June 2022 Completed. Ongoing annual review

Table 1 (Continued)
Mine Closure Planning – Action Plan and Schedule

Risk Assessment Actions	Corresponding Landform TAP Actions	Target Completion Date
051: **Rehabilitation Methods SOPs** – Current rehabilitation practices have been refined over time with experience at the site however there is currently no documented methods statement or SOP in place. Develop a Rehabilitation Methods SOP document to include the processes specific for the site(s). This could include, but not be limited to: - Topsoil stripping and handling - rehab materials stockpiling and mass balance - habitat material salvage - Rehabilitation timing - Surface preparation - Topsoil spreading and allocation of topsoil - Spreading and addition of ameliorants - Seed selection - Seed purchase and storing - Seed application. - supervisor and operator training - design specifications for water infrastructure, etc. The document also needs include requirements for records that will be used to support the rehabilitation process and verify that the methodology used is appropriate. This information should be included in the document control system.	8	30 September 2022 with ongoing review and refinement
052: **Final Voids Strategy** – Undertake a study to review the preferred final void design which can be taken forward to the Regulator for agreement on relinquishment criteria. I.e. to add clarity to the definition of “safe, stable and non-polluting” and give certainty to achieving signoff status and residual risks. The assessment should include, but not be limited to: - overarching strategy – non-spill or flow through system; - detailed geotechnical design parameters agreeing on FoS; - erosion modelling completed on the designs; - review the areas available to enable treatment [approval boundaries]; - offsets and creeks; - cut and fill versus backfill and look at the cost benefits; - review the constructed landforms and the impact they have on achieving the preferred final void outcome; - review these keys assumptions that feed into the final void design; - review what impact the preferred final void will have on what water infrastructure can be retained and what the design parameters should be adopted to ensure long term stability; - review the surface and groundwater models, including fill and spill and water quality; and - establish success criteria for the final voids	1,3	30 June 2022 with ongoing review and refinement

Table 1 (Continued)
Mine Closure Planning – Action Plan and Schedule

Risk Assessment Actions	Corresponding Landform TAP Actions	Target Completion Date
053: **Final Void water balance** - Review the post-mining surface and groundwater models and understand the impacts of the preferred final void design. Prepare an updated final void water balance. This assessment is to include a review of the potential fill and spill scenarios along with a review of the resulting water quality and mitigation that may be required.	1,3	Completed. Ongoing review and refinement
056: **Review application of erosion modelling** - Identify landforms on the site(s) that represent typical sites and complete erosion modelling for these locations to demonstrate that the current design criteria are appropriate. In addition to the representative sites apply the erosion model on sites that are considered high risk across the site.	4,5,6	31 July 2022
057: **Development of a QA/QC process for landform design** - Develop and implement a QA/QC process around demonstrating that the landforms have been built to the approved design.	7,8	30 June 2022 Completed. Ongoing review and refinement
058: **Document control & Records** - Implement a document control and records keeping demonstrating that works completed as designed [ESF2].	9	31 December 2022
059: **Surface water infrastructure design review** – Review the current surface water infrastructure that will be retained post-mining and review the initial design parameters to make sure are functioning as designed and that they are long term stable. Where required propose mitigation or additional works to ensure long term stable post closure.	1,6	31 March 2023 with ongoing review and refinement
064: **PAF/NAF Placement Model -** Undertake a Life of Mine review of the dumped PAF levels and develop a model that shows with a high level of confidence what the RLs are of the PAF below the predicted groundwater level.	2	31 March 2023 undertaken during closure execution
067: **Coal Shaft Creek diversion design** - Complete the detailed design of the creek diversion.		30 November 2022 with ongoing review and refinement
077: **GIS data/records of rehabilitation implementation** - (Closure evidence, ESF2) - Prepare a spatially referenced database of rehabilitation implementation at Stratford and Duralie including: - evidence of rehabilitation date, - landform design, - rehabilitation target domain, - target vegetation community, - reference to specific completion criteria. Review the existing GIS data that can be pulled into the document and records management system. Undertake a review of the quality of data to ensure that it is accurate for external reporting (Rehabilitation Portal)	9	30 September 2023 Progressively prepared during closure execution.
081: **Management of Heritage Sites** - Undertake consultation with the RAPs to resolve the long-term management of the known Aboriginal heritage sites as part of the preparation of the detailed mine closure plan.		Completed. Periodic review and refinement in HMP.

Table 1 (Continued)
Mine Closure Planning – Action Plan and Schedule

Risk Assessment Actions	Corresponding Landform TAP Actions	Target Completion Date
085: **Detailed final landform design** – Review the existing final landform design and prepare a revised detailed final landform design considering all aspects of the current mine layout and the proposed post-mining land use. The assessment should include, but not be limited to: - detailed geotechnical design parameters, include geomorphology - erosion and runoff modelling completed on the designs - final waste mass balance - water infrastructure required in final landform - review the post-mining site water balance forecast	1,3,4,7	30 June 2022 Completed. Ongoing review and refinement in RMP.
086: **PAF Management Procedure** – Review the current processes being undertaken at the site and review and update with specific reference to mine closure outcomes. Use this review to develop a PAF management procedure that documents the requirements for the management of PAF at the site(s) as they move towards closure.		31 July 2022

1.1 REHABILITATION & CLOSURE RISK ASSESSMENT

A description of the Rehabilitation & Closure Risk Assessments prepared for the DCM is included in Section 3 of the RMP. A copy of the latest revision of the Risk Assessment is included in Attachment 1 of the RMP and the action plan has guided the preparation of this MCPP.

Rehabilitation & Closure Risk Assessments prepared for the DCM include:

- Environmental RA 2009 (SP Solutions 2009) - identified environmental and rehabilitation risks relevant to the Duralie Coal Mine.
- Rehabilitation and Closure RA 2017(HMS, 2017) – reviewed the previous risk assessment and updated the risk and impacts specifically related to rehabilitation and closure.
- Detailed Mine Closure & Rehabilitation RA 2021 (IEMA, 2021) – reviewed the outcomes from the earlier risk assessments and considered these risks in more detail in preparation for closure execution.

The mine closure planning schedule includes a mid-point Risk Assessment review and a final Risk Assessment review which will update the risk register following the completion of various technical studies and strategies.

- Mid-point Risk Assessment: Mid-point will be timed to coincide with completion of technical studies. It will ensure that risks identified during the initial closure risk assessment have been closed out. It will also review technical studies that will contribute to the Mine Closure Plans.
- Final Risk Assessment: The final risk assessment will be timed to occur immediately before finalisation of the Mine Closure Plan documents. It will close out all technical closure risks. Any risk that will be carried into the post closure period will be recorded in a Residual Risk Register and these will be managed as required. The final risk assessment will also include an operational closure risk assessment for the closure and execution phase (to be completed in accordance with Yancoal risk protocols).

- Public Safety Risk Assessment: A public safety risk assessment will be completed in accordance with Yancoal Risk Protocols and consider public safety risk during closure and execution as well as any residual safety risk posed by the site (e.g. highwalls).

1.2 REHABILITATION OBJECTIVES & COMPLETION CRITERIA

DCPL has prepared a new Rehabilitation Management Plan (RMP) for the Duralie Coal Mine (DCM) in accordance with the requirements of the NSW Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021 (the Regulation). The new RMP includes the requirement to prepare rehabilitation outcome documents including a rehabilitation objectives and completion criteria statement.

The revised DCM Rehabilitation Objectives and Rehabilitation Completion Criteria are included in Section 4 of the RMP. The objectives, indicators and completion criteria for each of the final land use and mining domains during the rehabilitation phases are specified in the RMP Table 7. The rehabilitation objectives statement and rehabilitation completion criteria statement has been prepared in accordance with the Resources Regulator's Form and Way Rehabilitation Objectives, Rehabilitation Completion Criteria and Final Landform and Rehabilitation Plan for Large Mines.

1.3 REHABILITATION EVIDENCE – DOCUMENTS & RECORDS MANAGEMENT SYSTEM

The MCPP included an action to develop an appropriate document and records control management system to be used during the mine closure process. The purpose is to ensure all relevant rehabilitation evidence is documented and recorded to demonstrate and verify closure objectives and completion criteria have been meet. The system will move away from traditional paper-based reports and capture data directly to a spatially enabled database that also links to and manages relevant documents.

A rehabilitation evidence document and records management system is currently under development and a "proof of concept" testing currently underway. The system will use a combination of GIS spatial capabilities and data storage to present and access the spatial data linked to records and documents of rehabilitation and closure implementation. Controlled data and reports will be backed up and stored in a document management system and linked to the spatial platform. Yancoal is developing closure projects across multiple sites and is investigating integration between the ESRI suite and its document management system, M-Files. The system will be informed by and aligned to the RMP closure completion criteria (RMP Section 4) and the Quality Assurance (QA) process (RMP Section 7).

This system will be utilised throughout the rehabilitation and closure execution phase to provide records of rehabilitation evidence. This will be followed by progressive preparation of ESF2 applications (or equivalent required by the Resources Regulator) during and after closure execution to achieve final rehabilitation sign-off in preparation for site relinquishment.

1.4 REHABILITATION QA/QC PROCESSES

The MCPP included an action to develop and implement a QA/QC process for rehabilitation activities including demonstrating that the landforms have been built to the approved design and rehabilitation has been implemented as per the defined procedures to deliver the intended final land use.

A Rehabilitation Quality Assurance Process has been included in Section 7 of the RMP. The Rehabilitation Quality Assurance Process will be implemented which details the key actions and/or processes nominated for each rehabilitation phase to ensure that:

- Rehabilitation is implemented in accordance with the nominated methodologies and designs.
- Identified risks to rehabilitation are adequately addressed before proceeding to the next phase of rehabilitation.
- Rehabilitation is completed to the standard required to achieve the applicable completion criteria.

The Rehabilitation Quality Assurance Process will measure how the requirements of the RMP have been met and will document the rehabilitation evidence used for assessing against the completion criteria. The Rehabilitation Quality Assurance Process will be integrated into day-to-day activities at the DCM and implemented during rehabilitation and closure, until rehabilitation relinquishment has been achieved. The Rehabilitation Quality Assurance Process is outlined in Table 10 of the RMP. Rehabilitation validation monitoring is undertaken as described in Section 8 of the RMP.

Yancoal is now looking to integrate the QA process with the spatial data platform for the rehabilitation evidence documents and records management system. ITP and checklist processes are being developed for each phase of rehabilitation at the site, including specific processes for landform design and establishment, demolition and rehabilitation activities. This system will be utilised throughout the closure execution phase to provide records of landform design and rehabilitation evidence.

1.5 APPROVALS AND MINING LEASE RELINQUISHMENT STRATEGY

Details of the date of grant and duration of the Project Approval, mining authorisations and licenses issued by the relevant government agencies for the DCM are provided in Section 1.2 and Table 1 of the RMP.

An Approvals/Licences Relinquishment Strategy and a Tenements Relinquishment Strategy will be developed for the DCM that outlines the process and indicative timing for relinquishing/surrendering the DCM's approvals and mining leases following mine closure. The timing for relinquishment/surrendering each approval instrument will be informed by the conditions or requirements associated with each instrument, and the likely consultation requirements involved.

The preparation of these strategies has commenced. The strategy will outline the general relinquishment timing and pathway to ensure all approvals and licences are closed out in a strategic way. The Tenements Relinquishment Strategy will be finalised in October 2022. A preliminary Approvals and Licences Relinquishment Strategy will be finalised in September 2022 with the final exit strategy being delivered in mid-2023.

1.6 FINAL LANDFORM DESIGN

The new RMP includes the requirement to prepare rehabilitation outcome documents including a final landform and rehabilitation plan. The Final Landform and Rehabilitation Plan is described in Section 5 of the RMP and has been prepared to show the proposed final land use and final landform at the end of the mine life.

The rehabilitation objectives for the final landforms requires final landform designs which sustain the intended land use for the post-mining domain(s). Final landforms are to be consistent with and complement the topography of the surrounding region to minimise the visual prominence of the final landforms in the post-mining landscape. Final landforms are to incorporate design relief patterns and principles consistent with natural drainage.

The conceptual DCM final landform design (prepared as part of the 2014 Modification EA) has been refined to reflect the status of the DCM upon completion of mining operations. As mining of the Clareval and Weismantel open pits was not undertaken to the depths modelled in the conceptual final landform design, the changes to the conceptual final landform design are therefore primarily limited to the final voids and immediate surrounds. The only other change to the conceptual final landform is the removal of Auxiliary Dam No. 1, with Auxiliary Dam No. 2 and the MWD being retained, however reduced in size.

An updated final landform design was completed in December 2021 following completion of mining at the DCM.

DCPL has prepared the spatial data files in accordance with the spatial data theme requirements described in the Resources Regulator's Form and Way Rehabilitation Objectives, Rehabilitation Completion Criteria and Final Landform and Rehabilitation Plan for Large Mines (RMP Section 5).

As required by the MCPP, numerous technical assessments have been undertaken based on the refined final landform design, including a Landform Stability Assessment, a Geotechnical Assessment of the final voids, post-mining groundwater recovery model, final void water balance and final void water quality review, and a revised site water balance.

1.6.1 Landform Erosion Modelling

In accordance with the recommended risk reduction actions from the Rehabilitation and Mine Closure Risk Assessment, following the completion of final landform rehabilitation works (during the post-closure phase), a Stability Assessment will be undertaken of all drainage features, water management areas and rehabilitated waste emplacements to verify the long-term stability of the final landform, and a Geotechnical Assessment of the final voids will be undertaken to verify the long-term stability of final void walls.

The revised DCM Rehabilitation Objectives and Rehabilitation Completion Criteria (Section 4 of the RMP) includes requirements for landform erosion modelling to demonstrate the creation of landforms which are geotechnically stable and minimise long-term erosion on rehabilitated waste emplacements.

A review of the application of erosion modelling will be undertaken mid- 2022. and the proposed approach to landform erosion modelling will be addressed in the RMP. This review will identify landforms on the site that represent typical sites and recommend erosion modelling for these locations to demonstrate that the current design criteria are appropriate. In addition to the representative sites the erosion model will be applied on sites that are considered high risk across the site. Erosion modelling data will be used to fine-tune final site rehabilitation and be documented in subsequent revisions of the RMP.

1.7 FINAL VOID STRATEGY

Under the Project Approval, at the cessation of mining, the northern extents of the currently approved mining areas include final voids in the Clareval pit and Weismantel pit. A final void water balance and groundwater model was prepared for the DEP EA 2010 and was revised for the Open Pit Modification EA 2014.

The revised DCM Rehabilitation Objectives and Rehabilitation Completion Criteria (Section 4 of the RMP) includes objectives, performance indicators and completion criteria for the final void areas including specific criteria during each rehabilitation phase and the risk associated with rehabilitation and closure of the final voids.

The mine closure planning schedule includes several components relating to the final void strategy, including a review of the final void geometry and an assessment of void water quality and final void function (hydrology and hydrogeology) post closure.

1.7.1 Refined Final Void Design, Geotechnical Assessment & Completion Criteria

The following works have been completed in relation to the preparation of a final voids strategy:

- Refinement of the proposed final landform with focus on the final voids based on the survey of the Duralie landform at the completion of mining (i.e. Dec 2021).
- Initial geotechnical assessment was carried out to identify areas of concern related to geotechnical stability of the final void landforms, to inform the development of a set of final void completion criteria, and to provide recommendations for the long-term stability of slopes, and to meet conditions of the final landform completion criteria, as approved by the NSW Resources Regulator.
- Development of final void completion criteria for the final voids which result from implementing the current mine plan and the proposed final landform. Completion criteria have been developed for the key risks and impacts relating to final voids, and for each phase of rehabilitation and are presented in a format that aligns with the NSW Resources Regulator's Guideline Rehabilitation objectives and rehabilitation completion criteria.

A refined final void design has been prepared. Mining of the Clareval and Weismantel open pits did not occur to the maximum approved depth as modelled in the 2014 Modification EA. As such the design of the Clareval and Weismantel final voids has been refined to reflect the shallower depth of each pit. The final maximum depth of the Clareval final void is -95 m AHD and the final maximum depth of the Weismantel final void will be -8 m AHD. The refined final void design also aims to minimise the overall extent of the void area and the catchment area compared to the conceptual design in the 2014 Modification EA.

An initial Geotechnical Assessment of the final voids has been undertaken to verify the long-term stability of final void walls. Generally the assessment found that the voids will be long term stable. This work has been independently reviewed and some additional investigation is recommended to be completed during mid 2022.

1.7.2 Post-mining Groundwater Recovery Model

The groundwater model for the post-mining groundwater system is intrinsically related to the final void water balance. In conjunction with the final void water balance review, SLR has undertaken a verification of the site groundwater model in relation to the final landform designs and to confirm the groundwater seepage rates to the final void. The groundwater model revision was completed in 2020, however the outcomes of this study indicated further revision would be required to achieve satisfactory outcomes for the proposed final landform and final void design.

SLR is currently undertaking a further review and verification of the site groundwater model in relation to the refined final landform designs from December 2021 and to confirm the groundwater seepage rates to the final void to ensure the function of the final voids is consistent with the approved completion criteria. Completion of the groundwater model review and groundwater assessment for closure is due for completion in September 2022.

1.7.3 Final Void Water Balance

A final void water balance was prepared for the 2014 Modification EA. The final void water balance conducted by Gilbert & Associates (2014) for the DCM indicates the final voids would slowly fill over time and the final water levels in the Clareval open pit and Weismantel open pit would stabilise below the spill levels.

A review of the final void water balance has been prepared by HEC in 2020 to ensure the balance incorporates the refined final landform design, surface water inflows and outflows to/from the final void and to predict the long-term filling and equilibrium level, however the outcomes of this study indicated further revision would be required to achieve satisfactory outcomes for the proposed final landform and final void design.

ATC Williams is currently undertaking further recalibration and verification of the final void water balance based on the refined landform from December 2021 to ensure the function of the final voids is consistent with the approved completion criteria. Completion of the final void water balance review is due for completion in September 2022.

1.7.4 Final Void Water Quality

A review of the medium to long term water quality predictions of the final void against available monitoring data has been prepared by HEC to determine the requirement for additional/alternate management measures other than that currently proposed. Further revision of these studies will be required following the completion of the detailed final landform design and post-mining groundwater model.

1.8 WATER MANAGEMENT

The rehabilitation and post-mining water management strategy is described in the DEP EA 2014 and the WMP. The refined final landform design has been considered in the context of the surface water management system for closure and to ensure that it is integrated with the final landform

1.8.1 Site Water Balance

In accordance with Condition 29(a), Schedule 3 of Project Approval (08_0203), a site water balance has been prepared for the DCM by a suitably qualified and experienced person, Mr Lindsay Gilbert (formerly of Gilbert & Associates Pty Limited, now ATC Williams).

As described above a review of the post-mining site water balance has been prepared by ATC Williams to ensure the water balance incorporates the final landform design. The site water balance is included in the DCM Water Management Plan.

Site water balance reviews are undertaken annually to track performance of the DCM water management system including inflows, outflows, and current storage. The current site water balance provides the baseline for the development of the post-mining site water balance.

Further review and verification of the post-mining site water balance will be undertaken throughout the closure phase.

1.8.2 Water Infrastructure Retention Strategy

A review of water management infrastructure has been undertaken to ensure all surface water aspects and impacts have been considered for closure and appropriately managed in the Mine Closure Plan for Duralie. Details are included within the water management domain sections within the RMP.

Consistent with the approved DCM, rehabilitation of water management infrastructure will occur in consultation with regulatory authorities and the community, considering future local and regional water infrastructure needs.

Permanent water infrastructure, including site water dams (e.g. reconfigured MWD, Auxiliary Dam No. 2) and accompanying upstream diversion structures may be retained in the DCM final landform for future use. Retained water infrastructure will be determined in consultation with the regulatory authorities and the community and will consider the *Karuah River Catchment Management Plan* (Great Lakes Council, 2015), and future local and regional water infrastructure needs. The final uses of the retained water storages will be determined during the consultation process. Specific detail regarding the Coal Shaft Creek reconstruction is described in Section 1.8.3. Specific detail regarding the mine water dam decommissioning is described in Section 1.8.4.

Sediment dams will remain pending long-term acceptable water quality and may be kept for stock water if suitable.

Irrigation infrastructure owned by DCPL will be decommissioned, unless used for post-mining agricultural use.

Water Infrastructure Design Review

The water infrastructure retention strategy will include a review of the current surface water infrastructure that will be retained post-mining and review the initial design parameters to make sure are functioning as designed and that they are long term stable.

A review of the design for water management infrastructure to be retained is a component of the rehabilitation evidence system and QA/QC process for landform design which is included in the RMP Section 7. The preparation of water infrastructure design reviews will be progressively undertaken both during and beyond the closure execution phase. This evidence will ultimately support the preparation of ESF2 forms for rehabilitation signoff by the Resources Regulator.

1.8.3 Coal Shaft Creek Reconstruction Plan

Re-construction of the lower reaches of Coal Shaft Creek is required following the completion of mining activities. The Coal Shaft Creek Reconstruction Plan was prepared in December 2012, in accordance with Condition 29(b), Schedule 3 of Project Approval (08_0203) and provides a conceptual design for the creek reconstruction. The plan is included as an attachment to the DCM Water Management Plan.

The current proposed design for the post-mining alignment of Coal Shaft Creek comprises a reworked section of the existing Coal Shaft Creek diversion channel, a drop-down section outside the in-pit waste rock emplacement, and a reconstruction of the creek within a corridor over the in-pit waste rock emplacement at the southern end of the Weismantel open pit extent.

DCPL is currently conducting analyses into the detailed geotechnical, hydrological and hydraulic design of the final alignment, in consideration of the refined final landform design. The analyses will focus on long-term stability, seepage management and the creation of habitat. The outcomes of these analyses will inform the final detailed design of the post-mining alignment and reconstruction of Coal Shaft Creek.

Selection of final form and alignment will be subject to a detailed hydraulic analysis as part of final design, together with an assessment of the likelihood of bed/bank erosion on the outside of bends under a range of flow conditions (Gilbert & Associates, 2010).

The conceptual longitudinal channel profile will also include habitat creation initiatives such as the provision of irregular pool and riffle sequences, use of material recovered from the existing channel or some other suitable source, placement of large boulders and/or timber to form pools upstream and promote aquatic habitat and planting of riverine vegetation on banks to enhance stability (Gilbert & Associates, 2010).

ATC Williams has been commissioned to prepare a detailed final design of the Coal Shaft Creek re-alignment and reconstruction. The Coal Shaft Creek Reconstruction Plan will be prepared in consultation with the relevant authorities and stakeholders and be finalised towards the end of 2022. The Coal Shaft Creek Reconstruction Plan will be described in the detailed Mine Closure Plan and included as an attached to the Water Management Plan.

Following the completion of detailed design, the Coal Shaft Creek Reconstruction Plan will be revised and submitted to DPIE Water for consultation, prior to submission to DPIE Planning and Assessment Division for approval. Indicative timing for re-construction of coal shaft creek is 2023.

1.8.4 MINE WATER DAM DECOMMISSIONING STRATEGY

The MWD, Auxiliary Dam No. 1 and Auxiliary Dam 2 are all declared dams under the NSW *Dams Safety Act, 2015*.

Management plans for the declared dams are combined into single documents. The DCM Prescribed Dams Operation and Maintenance Manual was updated and approved by the DSC during 2018. The Prescribed Dams Safety Emergency Plan (DSEP) was updated in consultation with the NSW State Emergency Service (SES) and approved by the DSC during 2017.

DCPL is required to prepare a strategy for decommissioning of the mine water dams and for integration with the final land use. Additionally, DCPL is required to prepare a strategy for transferring mine water from the declared dams back to the final voids following the completion of mining activities.

A Conceptual Decommissioning Strategy for the DCM's declared mine water dams has been prepared by ATC Williams Pty Ltd (ATC Williams) (2019). The conceptual decommissioning plans were submitted to NSW Dam Safety in 2019 who requested an independent peer review of the proposed strategy. Norm Himsley was endorsed by Dam Safety NSW to peer review the decommissioning strategy. Following the independent review, a detailed Duralie Dams Decommissioning Strategy (ATC Williams, 2021) was prepared by ATC Williams and the plans were resubmitted to NSW Dam Safety for endorsement.

The strategy has been prepared in consideration of relevant NSW Dams Safety's guidance sheets and Australian National Committee on Large Dams (ANCOLD) guidelines, including:

- DSC2D – Demonstration of Safety for Dams;
- DSC3A – Consequence Categories for Dams;
- DSC3B – Acceptable Flood Capacity of Dams;
- ANCOLD Guidelines on the Consequence Category for Dams (2012); and
- ANCOLD Guidelines on Risk Assessment (2003).

The decommissioning strategy proposed that Auxiliary Dam No. 1 will be decommissioned and will not form part of the DCM final landform, while Auxiliary Dam No. 2 and the MWD will be reduced in size and retained for beneficial use by a future landholder.

The approach for Auxiliary Dam No. 2 and the MWD is to reduce the capacity of the dams such that under a dam break scenario, the consequence category would be considered Low, thereby having no ongoing regulated status (ATC Williams, 2021).

A summary of the final configuration dimensions for Auxiliary Dam No. 2 and the MWD are provided in Table 14.

Table 14
Retained Dam Design Configurations

Parameter	MWD		AWD2	
	Current	Proposed	Current	Proposed
Storage Capacity	1,405 ML	225 ML	2,866 ML	475 ML
Embankment Elevation	RL 74.6 m	RL 72.0 m	RL 100.0 m	RL 87.5 m
Full Supply Level	RL 73.0 m	RL 65.0 m*	RL 98.5 m	RL 86.5 m
Total Catchment Area	211 ha	212.7 ha	71.4 ha	72.4 ha
Maximum Embankment Height	16.8 m	14.8 m	27.3 m	14.8 m
Consequence Category	High C	Low	High C	Low

*The full supply level for the MWD is the low flow pipe. The emergency spillway level is at RL 70.3 m, allowing for an additional 475ML of flood storage from AWD2.
Source: ATC Williams (2021)

The spillway design criteria reflect a 'Low' consequence classification as specified in NSW Dams Safety Committee guidance sheet *DSC3B Acceptable Flood capacity of Dams - Table 5.1*. The spillway design for each dam assumes a 0.1% annual exceedance probability rainfall event and will be rock armoured.

ATC Williams (2021) has prepared detailed engineering drawings for the decommissioning of the prescribed dams, and has developed a decommissioning process for each dam, as follows:

> ***Decommissioning Methodology – MDW and AWD2***
> *Conceptual closure plans for the structures are provided attached, with the following decommissioning construction schedule proposed:*
>
> 1. *Erosion and Sediment Control*
>   a. *Implement appropriate Erosion and Sediment Control (ESC) Measures;*
>   b. *Use the MWD as the sediment dam during decommissioning works.*
> 2. *Decommissioning AWD2*
>   a. *Dewater AWD2 through pump transfer to the MWD, maintaining the level indicated in the drawings;*
>   b. *Excavate the embankment to the levels and profiles defined in the drawings;*
>   c. *Remove the associated structures and monitoring equipment;*
>   d. *Construct the new spillway as per the drawings; and*
>   e. *Topsoil and revegetate exposed bare earth areas*

3. *Decommissioning MWD*
    a. *Dewater the MWD through pump transfer to the Pit to the level indicated in the drawings*
    b. *Implement new erosion and sediment controls, including a new sediment dam;*
    c. *Excavate the embankment to the levels and profiles defined in the drawings;*
    d. *Install low flow pipelines, reinstate embankment material;*
    e. *Construct a new spillway as per the drawings; and*
    f. *Topsoil and revegetate exposed bare earth areas.*
4. *Removal of diversion structures associated with the water dams as either;*
    a. *Complete removal of bunds and regrading of the subsurface; or*
    b. *Break the chainage and provide rock armouring in as per drawings at sag points and valleys.*

Detailed Decommissioning Methodology – AWD1

The detailed closure plan presented as construction drawings and specification for AWD1 is provided in Attachment 1. A summary of the closure methodology is described as follows:

a) *Dewater all the storage contained in AWD1 through pump transfer to the approved mine void/MWD;*
b) *Excavate the embankment at the critical section or lowest point to prevent any accumulation of runoff;*
c) *Remove the remaining embankment and stockpiles material; and*
d) *Remove the associated structures and monitoring equipment.*
e) *Topsoil and revegetate exposed bare earth areas*

AD1 was dewatered during February 2018 and decommissioned during 2020 with the structure completely removed. AD2 is planned to be dewatered during 2022 and decommissioning works will commence following endorsement of the proposed strategy by NSW Dams Safety (indicative timing is early to mid-2023).

1.9 REHABILITATION RESOURCES

Rehabilitation resources refers to all physical resources required to carry out rehabilitation of the DCM, including topsoil, clay, rock, and habitat material. The requirement for a LOM rehabilitation materials register is included in the RMP.

Topsoil resources are managed in accordance with the RMP. To ensure suitable and adequate topsoil resources are available for final rehabilitation, a site topsoil balance is undertaken annually, and the volume compared to the total remaining disturbed area requiring rehabilitation.

Topsoil stripping has now been completed up to the northern extent of both the Clareval pit and the Weismantel pit. There are currently sufficient topsoil resources available to complete rehabilitation of the DCM.

The DCM's topsoil balance will be augmented to incorporate estimates of other materials required to complete rehabilitation of the DCM, including inert capping material (i.e. NAF material) and clay for the Coal Shaft Creek Reconstruction. Estimates of clay volumes required for Coal Shaft Creek Reconstruction will be determined once the detailed design works for the revised Coal Shaft Creek Reconstruction Plan have been completed.

Clay resources will be required for the construction of clay cut-off walls along the southern end of the toe of the waste rock emplacement to reduce direct seepage out of the waste rock emplacement to negligible levels. Clay resources would also be required for lining of the reconstructed Coal Shaft Creek and potentially for the construction of other water management features. Details are included in the CSC Reconstruction Plan. A clay balance will be developed to identify to current clay resources available and the estimated clay volumes required for rehabilitation.

The NSW Resources Regulator completed a TAP inspection regarding rehabilitation soils and materials management at the DCM on 10 September 2020. The assessment focused on progressive rehabilitation obligations as outlined in the RMP and how materials and soils on site were being managed to achieve sustainable rehabilitation outcomes. The site inspections identified no significant rehabilitation risks or compliance issues at the DCM.

The Resources Regulator provided a summary of observations and recommendations on 24 September 2020:

- Update the risk assessments for rehabilitation and mine closure.
- Develop an assurance process to validate monitoring and inspection results to ensure rehabilitation control measures are effective throughout the mining/rehabilitation lifecycle.
- Reporting of any delays to rehabilitation progress in the Annual Reviews.
- Conduct agricultural rehabilitation trials to demonstrate completion criteria.
- Assess and report on the requirement for clay resources at Duralie as part of the annual material balance survey.
- Review of the Rehabilitation Trigger Action Response Plan included in the MOP.

These recommendations were considered and addressed in the rehabilitation and closure risk assessment and have been included in the preparation of the new RMP.

1.10 INFRASTRUCTURE DECOMMISSIOING & DEMOLITION

The MCPP includes consideration for infrastructure decommissioning and demolition including:

- Identify and remove/demolish all non-active infrastructure which is not required post-mining.
- Undertake consultation to confirm any alternative use for retained infrastructure (i.e., rail siding, haul roads, access tracks and dams) post-mining.

DCPL is preparing a Decommissioning & Demolition Plan for the site which includes a list of all infrastructure to be removed, assessment of waste streams and volumes, consideration of hazardous materials [i.e. asbestos, radiation sources, etc.] and potential contaminated lands. The strategy includes a management and maintenance strategy for any assets that are retained.

The preparation of several strategies has commenced to assist the closure project to identify infrastructure and assets to be decommissioned/demolished or to be retained on site and to identify the most appropriate method/s to allow decommissioning or retention to occur. This includes the following requirements:

- Fixed and Mobile Plant Asset Register.
- Infrastructure Assets Register.
- Hazardous Materials Assessment.

- Contaminated Sites Assessment.
- Decommissioning & Demolition Plan.
- Closure Waste Management Plan.

1.10.1 CONTAMINATED LAND ASSESSMENT

A contaminated land assessment will be undertaken once mining operations have ceased, during the mine closure phase. The assessment will focus on decommissioned infrastructure areas, including ROM coal handling and stockpiling facilities, workshops, fuel storage areas and chemical storage facilities.

The contaminated land assessment will be undertaken in accordance with the requirements of the NSW *Contaminated Land Management Act, 1997* and in consideration of relevant guidelines, including the *Managing Land Contamination Planning Guidelines SEPP 55–Remediation of Land* (Department of Urban Affairs and Planning and EPA, 1998), *Guidelines for Consultants Reporting on Contaminated Sites* (OEH, 2011) and the *National Environment Protection (Assessment of Site Contamination) Measure* (National Environment Protection Council, 2013).

Scoping and engagement of the preliminary site investigations has commenced and will include an initial limited sampling program as most areas for investigation (i.e. that are potentially contaminated) are already known. Follow-up detailed assessments including intrusive investigations will be undertaken in the second half of 2022. The detailed assessments will provide recommendations for the development of a Remediation Action Plan, that will inform future contamination clean-ups.

All contamination areas will be remediated as recommended in the Remediation Plans, which is expected to involve excavation of the contaminated materials and disposal at an off-site licensed facility or treated on-site subject to relevant approvals being obtained. The remediation of any identified contaminated land would be undertaken in conjunction with the infrastructure decommissioning plan. Rehabilitation of the area would be undertaken in accordance with the rehabilitation objectives for the Infrastructure Area Domain (i.e. revegetated to native ecosystem), or domain applicable to the area.

1.10.2 HAZARDOUS MATERIALS ASSESSMENT

A hazardous materials assessment will be undertaken for closure and will inform the Decommissioning & Demolition Strategy and the Closure Waste Management Plan.

DPCL maintains a register of chemicals and hazardous materials on site and this will be used as a basis for investigation. An audit of all chemicals stored at the DCM was undertaken in 2021. The Hazmat Assessment scope will refine existing registers, highlight any issues for decommissioning and demolition and provide guidance for safe disposal of hazardous materials. The Hazmat Assessment will be finalised during 2022.

1.10.3 INFRASTRUCTURE DECOMMISSIOING & DEMOLITION STRATEGY

Infrastructure Removal or Retention

Infrastructure anticipated to be removed from site includes:

- fixed equipment and infrastructure (for re-use at another location [e.g. the SMC] or recycling); and
- non-salvageable/non-recyclable and non-contaminated infrastructure (for disposal at an off-site licensed facility or on-site subject to relevant approvals being obtained).

Once all equipment and infrastructure components not required for mine closure have been removed from an area, the area will be rehabilitated in accordance with the rehabilitation objectives for the Infrastructure Area Domain (i.e. revegetated to woodland/open forest). Rehabilitation will involve deep-ripping the area, topsoiling and seeding/planting with woodland/open forest species.

Some concrete hardstands, administration and ablution buildings, site access roads, sheds, buildings and sediment dams may be retained for alternate post-mining uses, subject to consultation with the relevant stakeholders and regulators.

Electricity transmission infrastructure will be retained for future use by landholders unless during consultation landholders/stakeholders determined it is no longer required, in which case it will be decommissioned and removed from site.

The rail siding may also be retained for future use if agreed with relevant regulatory authorities and if appropriate approvals are obtained.

It is anticipated that internal light vehicle tracks will be retained for future use to facilitate management access through the site.

Removal Strategy and Timing

Since mining has ceased, the majority of plant, mobile equipment and consumables have been removed from DCM to the Stratford Mining Complex. Infrastructure and equipment required to support final rehabilitation activities (i.e. landform bulk shaping and soil placement) has remained on site.

A general site clean-up is currently occurring, and it is envisaged that all scrap and materials at the site that are no longer required or that can be recycled/landfilled will be removed from site during 2022.

Design for removal of all CHP infrastructure will be completed in mid-2022 and physical removal to slab level will be completed by end 2022. Any ground disturbance and removal of slabs will depend on completion of the contamination studies and is not currently scheduled.

Scheduling of infrastructure removal will be undertaken on a campaign basis to minimise disruptions to road networks. Oversize heavy vehicle transport of infrastructure/equipment will be undertaken in accordance with relevant permits and load declarations obtained in accordance with *Additional Access Conditions – Oversize and overmass heavy vehicles and loads* (Roads and Maritime Services, 2017) (or its current equivalent at the time of the event) and any other licences and escorts as required by regulatory authorities. Any relevant permits and transport requirements will be obtained in consultation with the RMS and relevant local councils at the time.

Heavy vehicle scheduling will, where possible, consider and occur outside of peak periods associated with general movement of vehicles (e.g. morning and afternoon peak traffic times) to minimise disruptions to the road networks along the transport route.

1.10.4 Closure Waste Management Strategy

The MCPP included the development a strategy to manage the waste streams generated by the demolition of site infrastructure. This is to include identifying a suitable licensed disposal option and the use of appropriately licensed contractors to manage the waste transfer and disposal.

Work on the waste management strategy will commence around early-2023 and inform DCPL of options and legal requirements for waste disposal, including recycling. Following completion of the Decommissioning & Demolition Plan, the closure waste management plan will be developed to record quantities of various waste streams and inform management requirements. Relevant details will be included in subsequent revisions of the RMP.

1.11 BIODIVERITY OFFSET INTEGRATION

The Duralie Extension Project Biodiversity Offset Area has been established and is managed in accordance with DCM's Biodiversity Management Plan (BMP). Completion criteria have been developed for the DCM's Offset Strategy which includes:

> *Native vegetation has been established which directly links vegetation areas of the Offset areas with the Rehabilitation area.*

The DCM BMP includes an Assessment Target for this Completion Criteria which includes:

> *Management Units A, E, B, T, W, S, X, Y, Z and F are to have met individual Completion Criteria as above to ensure a continuous link across the floor of the Mammy Johnsons River valley floor.*

Completion of the Offset Strategy will be assessed against the completion criteria in the DCM's BMP.

An annual Biodiversity Report which tracks progress of the offset areas against the completion criteria will continue to be prepared and made available on DCM's website.

Long Term Biodiversity Security

In accordance with Condition 42, Schedule 3 of the Project Approval (PA 08_0203), DCPL is required to make suitable arrangements for the long-term security of the Duralie Extension Project Biodiversity Offset Area. DCPL used the mechanisms available under section 88E(3) of the *NSW Conveyancing Act, 1919*, namely:

- Registration of a Positive Covenant under section 88E(3) of the NSW *Conveyancing Act 1919*; and
- Registration of a Restriction on the Use of Land by a Prescribed Authority under section 88E(3) of the NSW *Conveyancing Act 1919*.

Public Positive Covenants and Restrictions on the Use of Land for the Biodiversity Offsets have been registered on title with NSW Land and Property Information in May 2015.

Biodiversity Conservation Bond

In accordance with Condition 44, Schedule 3 of the Project Approval (PA 08_0203), DCPL is required to lodge a Conservation Bond with the DPE which covers the cost of implementing the Biodiversity Offset Strategy detailed in the DCM Biodiversity Management Plan (BMP).

The conservation bond for the Biodiversity Offset areas was calculated by Greening Australia and verified by Rider Levett Bucknell in December 2013. The terms of the conservation bond in the form of a Bank Guarantee were approved by the NSW Department of Planning and Environment (DPE) on 12 December 2013. The Bank Guarantee has been subsequently provided to DPE.

In December 2020, an Independent Environmental Audit of the DCM was undertaken in accordance with the Project Approval (PA 08_0203). A revision of the BMP was approved in January 2019 in accordance with Condition 4, Schedule 5 of the Project Approval (PA 08_0203). Following this, a revision of the conservation bond will be prepared and lodged with DPE in accordance with Condition 45, Schedule 3 of the Project Approval (PA 08_0203).

1.12 HERITAGE SITE MANAGEMENT

The DCM Heritage Management Plan (HMP) has been prepared for the DCM in accordance with the requirements of Condition 46, Schedule 3 of PA 08_0203 and includes measures to manage potential impacts on items of heritage significance at the DCM.

In preparation for the mine closure phase DCPL has revised the HMP to reflect the current stage of operations, to describe anticipated mine closure activities and describe the current status of known Aboriginal heritage sites. The HMP also describes the process for consultation with relevant Aboriginal stakeholders to inform the long-term management of known heritage sites following closure.

In accordance with Condition 46(a) of PA 08_0203 the HMP has been provided to DPIE, Registered Aboriginal stakeholders, Heritage NSW and MidCoast Council for consultation purposes and is available on the DCM website.

1.13 POST-CLOSURE MONITORING AND MAINTENANCE PROGRAM

DCPL has prepared an initial Monitoring and Maintenance Program for closure as part of the Mine Closure Plan. This has been detailed within the existing Environmental Management Plans and the RMP. DCPL has reviewed the existing monitoring programs and aligned with and or added elements to specifically address the closure success criteria that are adopted in the RMP. The review also identified what elements of the existing monitoring system can progressively cease during the closure phase.

The mine closure phase will commence once all mining activities at the DCM have ceased. This phase will see all relevant infrastructure decommissioned and removed and all final landform rehabilitation works (e.g. bulk shaping, soil placement and revegetation activities) have been completed. The post-closure monitoring and maintenance phase is relevant to the period after the completion of all works needed to implement closure of the DCM, as described above, up until relinquishment of the DCM.

Post-Closure Monitoring

DCPL currently conducts numerous environmental monitoring programs at the DCM in accordance with the DCM's Project Approval, EPL and environmental management plan requirements, including air quality, noise, blasting, surface water, irrigation, groundwater, rehabilitation and offset area monitoring programs.

Some of these monitoring programs will continue during the post-closure phase (e.g. surface water and groundwater monitoring, rehabilitation monitoring), however, some programs will become redundant and will cease (e.g. blast monitoring, irrigation monitoring) or will be gradually refined once coal extraction and landform bulk shaping and soil placement rehabilitation works have ceased (e.g. noise and air quality monitoring). DCPL has refined its monitoring programs in consultation with the relevant government agencies in preparation for the mine closure phase.

It is anticipated that the surface water and groundwater monitoring program will be progressively refined during the post-closure period to focus on runoff areas from the major mine landforms and groundwater aquifers potentially impacted by the DCM.

Rehabilitation performance monitoring will continue throughout the post-closure phase and results from the rehabilitation monitoring program will be used to confirm that the rehabilitation completion criteria in the RMP have been met.

Similarly, monitoring of regeneration and revegetation performance in the biodiversity offset areas will continue during the post-closure phase and results from the offset monitoring program will be used to confirm that the offset area completion criteria have been met.

Further amendments to the monitoring programs during the post- closure phase will be reflected in the relevant environmental management plan revisions. It is expected that the residual monitoring programs will be undertaken for approximately ten years following mine closure.

The DCM Environmental Management Plans have been revised during 2021 (Section 1.15). The revised EMPs specifically describe the changes to management measures and monitoring programs as relevant during the closure phase.

Post-Closure Maintenance

Results from the post-closure monitoring programs will be used to inform the post-closure maintenance requirements (e.g. the requirement for erosion control, supplementary rehabilitation plantings or offset area revegetation plantings, weed and pest control activities). It is expected that any maintenance requirements will be undertaken on a campaign / as required basis.

Post-closure maintenance activities will continue until the specific completion criteria has been met and confirmation has been received from the relevant authority.

1.14 ENVIRONMENTAL MANAGEMENT PLANS

The DCM Environmental Management Strategy (EMS) and associated Environmental Management Plans (EMPs) have been prepared by DCPL in accordance with Project Approval 08_0203 to guide environmental management on-site:

- EMS;
- NMP;
- BLMP;
- AQMP;
- WAMP (including SWB, SWMP, IMP and GWMP);
- BMP;
- GBFMP;
- HMP;
- RMP; and
- WMP.

Similar to the post-closure monitoring programs during the mine closure phase, it is expected that a number of these management plans will become redundant to reflect the cessation of coal extraction and associated earthworks such as waste emplacement construction (e.g. the BLMP, NMP, IMP, HMP) or require revisions to reflect the refined scope of the monitoring programs (e.g. WAMP).

Revision and removal of these plans will be undertaken in consultation with the relevant regulatory agencies required under Project Approval 08_0203.

During 2021, DCPL has prepared revisions of the EMS and EMPs to describe the current status of operations at the DCM and reflect the transition to mine closure. The revised EMPs reflect the current stage of operations and describe anticipated mine closure activities and describe the change to environmental impacts, mitigation measures and monitoring programs at the DCM for the mine closure phase.

The EMPs have been approved by DPIE and are available on the Duralie Coal website.

Further amendments to the EMPs during the post- closure phase will be reflected in the relevant EMP revisions. It is expected that the residual monitoring programs will be undertaken for approximately ten years following mine closure.

1.15 HUMAN RESOURCES STRATEGY

Preparation of a Human Resources (HR) strategy and associated components has commenced in consultation with relevant site and corporate HR representatives. The HR strategy reflects the revised mining schedule and manning requirements during the rehabilitation and mine closure phase.

The completion of mining at the DCM has been aligned with the commencement of Yancoal's Stratford Extension Project at the SMC. During 2017, a strategy was developed to progressively transition all staff, employees and contractors from the DCM to the SMC. The process of transitioning the DCM workforce to the SMC commenced in July 2018, and by the end of October 2018, the remaining DCM workforce had been relocated to the SMC.

The recommencement of mining at the SMC has avoided the need to release any of the DCM workforce.

During 2021, a contractor fleet was mobilised at the DCM to finalised mining operations with coal mining finishing in December 2021. During 2022/2023, employees and/or contractors will be engaged/relocated to the DCM to undertake the rehabilitation and closure activities as described the RMP.

1.16 MINE CLOSURE STAKEHOLDER CONSULTATION STRATGEY

RMP Consultation

Proposed rehabilitation and post-mining land use concepts have been continuously developed throughout the DCM approval process, in consultation with relevant government agencies and key stakeholders, including the DCM's CCC.

The details the final rehabilitation and post-mining land use goals for the DCM have been provided to the following government agencies and key stakeholders for comment, as required by Condition 57, Schedule 3, of Project Approval 08_0203:

- Resources Regulator;
- DPIE Planning and Assessment Division;
- DPIE EPA;
- DPIE BCD;
- DPIE Water;
- MCC; and
- CCC.

Results of consultation undertaken with the abovementioned stakeholders will be incorporated into the RMP where relevant. DCPL will continue to consult with relevant government agencies and the community throughout the mine life and during mine closure.

Mine Closure Stakeholder Consultation Strategy

A Mine Closure Stakeholder Consultation Strategy has been prepared for the DCM. The strategy contains:

- Register and strategy for regulatory and government consultation;
- Register and strategy for consultation with near neighbours;
- Register and strategy for wider stakeholder groups;
- Strategy for sharing closure information and progress with the public.

Implementation of the strategy for key stakeholders has commenced with wider consultation to occur from the beginning of 2023.

1.17 CLOSURE SOCIO-ECONOMIC IMPACT ASSESSEMENT

A Socio-economic Impact Assessment was prepared as part of the Duralie Extension Project Environmental Assessment 2010. The socio-economic effects on the local community post-closure of the DCM have been considered as part of the MCPP.

As a result of recommencement of mining at the SMC in 2018 and the transition of the DCM workforce to the SMC, adverse socio-economic effects of mine closure of the DCM have been neutralised and no further reductions to the workforce have been required.

During 2021, a contractor fleet was mobilised at the DCM to finalised mining operations with coal mining finishing in December 2021. During 2022, employees and/or contractors will be engaged/relocated to the DCM to undertake the rehabilitation and closure activities as described in the RMP.

A socio-economic assessment will be undertaken to assess the impact on the local community as a result of the closure of both the Stratford and Duralie mines. This assessment will consider the impact of closure of the two mine sites on the local community and recommend mitigation strategies that can reduce any unwanted impacts that can be implemented during the closure phase. The strategy is due for completion at end of Quarter 3, 2022.

Upon the completion of mining operations at the DCM, the contributions to MidCoast Council required under Schedule 2, Conditions 16 and 17, of Project Approval 08_0203 will cease. Ongoing consultation has been undertaken with MCC. Notwithstanding, contributions to the MCC are required under the SMC Development Consent SSD_4966 until coal mining ceases.

ATTACHMENT A

DURALIE COAL MINE: CLOSURE & REHABILITATION RISK ASSESSMENT: SUMMARY OF KEY RISKS AND CONTROLS

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

Duralie Coal Mine

Closure & Rehabilitation Risk Assessment: Summary of Key Risks and Controls

Prepared for:
Yancoal Australia

2021

CONTENTS

1. RISK ASSESSMENT FOR REHABILITATION AND MINE CLOSURE

In 2021, IEMA was engaged by Yancoal to complete detailed risk assessments for the rehabilitation and closure of the Stratford Mining Complex (SMC) and the Duralie Coal Mine (DCM).

The risk assessment was conducted for the mine closure and rehabilitation stage of operations to provide guidance for the Mine Closure Planning Program and Rehabilitation Management Plan.

Consistent with NSW Resource Regulator guidelines, a bowtie risk assessment methodology was applied.

This document provides a summary of the methodology employed and risk assessment outcomes for the DCM.

1.1. Scope and Objectives

The purpose of the risk assessment (IEMA, 2021) was to identify and evaluate risks associated with the rehabilitation and closure of the site and to inform the preparation of a Mine Closure Planning Program. The risk assessment was undertaken in accordance with Yancoal's internal Mine Closure Risk Management Standard and Resource Regulator risk assessment guidance.

The objectives for each risk assessment included:

- Review the mine closure risks identified in the 2017 Mine Closure Risk Assessment (refer to previous Mining Operations Plan) to update the risks and controls based on the works completed to date (it is intended that this risks assessment would supersede the 2017 risk assessment).
- Use the collective knowledge of key site and corporate stakeholders to identify any new or additional risks.
- Develop a better understanding of the rehabilitation and closure commitments for the site.
- Identify and assess risks that could impact achieving the Rehabilitation Objectives, Completion Criteria and the Final Land Use for closure and result in closure delays, additional cost or non-compliances.
- Identify preventative controls [both existing and proposed] with a focus on identifying those assessed critical controls required for effective closure.
- Assess the effectiveness of existing controls and identify opportunities for control improvement.
- Develop an Action Plan to develop and implement new controls as well as address controls requiring improvement or development.

There were a wide range of aspects considered as part of the risk assessment for the DCM. These are summarised below as:

- Regulatory compliance.
- Closure Criteria.
- Post-mining uses and landforms.
- Closure planning, resourcing and governance.
- Human Resources.

- Community engagement and socio-economic impacts.
- Property and tenements strategy.
- Closure knowledge, records keeping, QA/QC processes.
- Mine closure costs.
- Decommissioning and demolition.
- Rehabilitation resources.
- Rehabilitation phase including growth media suitability, landform design and establishment, ecosystem establishment and ecosystem sustainability.

1.2. Methodology

The risk assessment was completed by Andrew Hutton (Director and Principal Consultant at IEMA) who has over 25 years of experience in mining operations and closure.

Seven workshop sessions were undertaken over two days. Participants within each workshop are outlined in Table 3. The workshops assessed key risks associated with rehabilitation and closure activities and covered the following themes:

- Life of Mine Plan and General Mine Closure Risks
- Decommissioning and Demolition
- Growth Media Suitability, Establishment, Rehabilitation Materials and Biological Resources
- Adequacy of Final Landform Design and Establishment
- Ecosystem Establishment
- Ecosystem Sustainability and Rehabilitation Completion; and
- Other management aspects.

Each workshop /risk assessment session was conducted using the Bow-Tie risk assessment methodology using BowTie XP software. This methodology uses a systematic approach to qualitatively identify risks associated with an unwanted event. Participants workshopped potential threats (causes) and barriers (preventative controls) to manage and prevent unwanted events. The workshop also identified mitigating actions, or controls, that Yancoal would implement to minimise consequences that could result in closure delays, additional cost or non-compliances.

The Bow Tie methodology focuses on qualitative assessment of controls to identify:

- The effectiveness of the control to prevent the threat.
- The criticality of the control (i.e., identify which are the ‘critical controls’ that must be implemented to avoid the unwanted event).
- Failure modes for critical controls, and measures to mitigate the potential failure modes such as training, monitoring and QA processes to verify that critical controls are implemented and effective.

- Required actions to be completed to implement new controls or processes and improve the effectiveness of existing controls considered by the group to require improvement.

1.3. Assessment of Critical Controls and Outcomes

The ICMM define critical controls as “an act, object or technological system which of itself will prevent or mitigate an incident” (ICMM, 2020).

The risk assessment workshop was conducted to give regard to the ICMM critical control management principles, including:

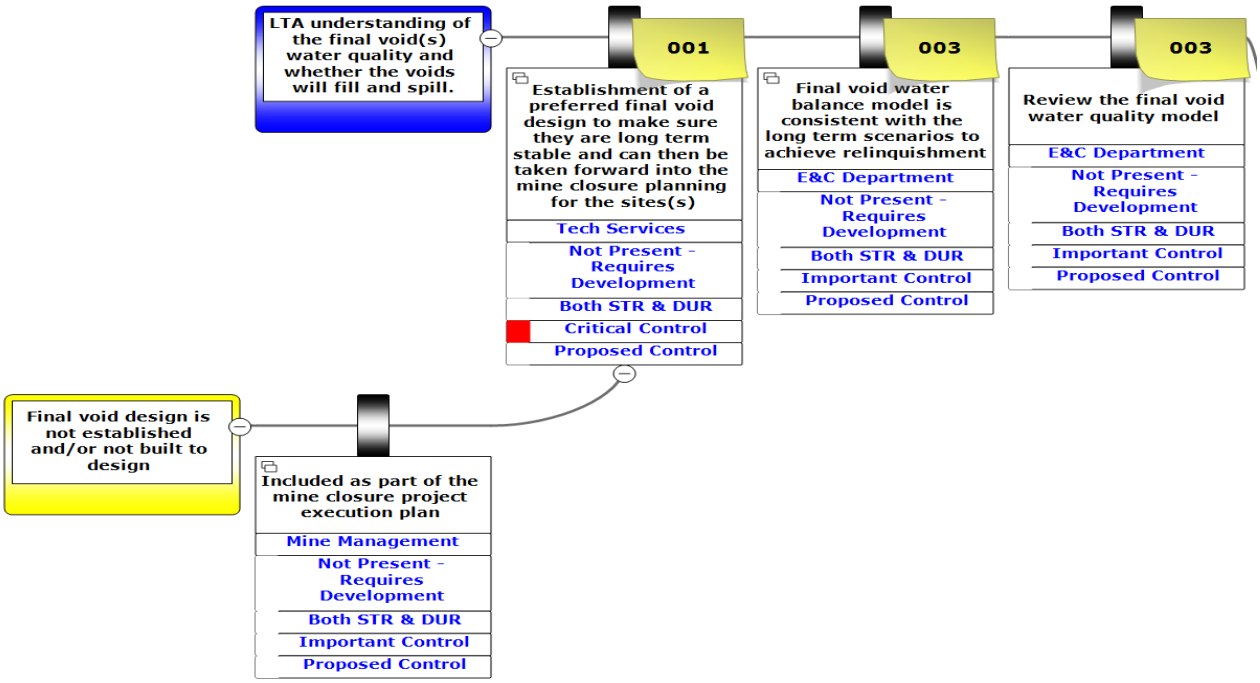
- Identifying the critical controls.
- Assessing what these controls need to do to prevent the undesired event.
- Identifying checks to ensure that the critical controls are working as intended.
- Accountability for the implementation of the controls (i.e., who is responsible for making it work?).
- Reporting on the performance of all critical controls.

The risk assessment identified the critical controls required to manage each identified risk.

Actions were assigned and included in a mine closure action plan to ensure that all identified controls were implemented as required.

Figure 8 below shows a worked example of a key mine closure risk assessed for the DCM.

Figure 8 - Critical control identification using BowTie XP



2. Risk Assessment Controls and Actions

Barrier actions were developed to address the risks and controls identified in the Risk Assessment. A mine closure action plan has been developed and includes the actions relating to all controls identified as critical or important. The tables below include a summary of the relevant risks and associated actions. **Table 1** includes those risks where a *critical* control has been identified, whilst **Table 2** includes the risks where an *important* control has been identified.

TABLE 1: SUMMARY OF DURALIE CRITICAL CONTROLS AND ASSOCIATED ACTIONS

Session	Risk	Critical Control	Actions	Status
Life of Mine and Closure Risks (General)	LTA Community Engagement which results in loss of reputation or loss of goods and services.	Mine Closure Stakeholder Engagement Strategy [linked to the HR strategy]	007: **Mine Closure Stakeholder Strategy** – Develop the Mine Closure Plan Stakeholder Strategy which will include a list of all relevant stakeholders, how they will be engaged with and when. In addition, this should include a consultation log which is a record of the engagement along with any outcomes and actions.	Proposed Control
	LTA assessment and mitigation of the social impacts relating to closure of the mine(s).	Socio-economic impact assessment which will include development of mitigation	009: **Socio-economic Impact Assessment** – Scope and prepare a study that is an assessment of the impact on the local community as a result of closure of the mines. There should be a focus on capacity building to ensure sustainability beyond closure of the mine.	Proposed Control
	Less than adequate Human Resources Strategy (redundancy / retention / redeployment)	Develop an HR strategy which is linked to the Mine Closure Plan.	004**:** **Develop the Human Resources Strategy** - Ensure that a representative from HR is involved in the Mine Closure working group so that the HR strategy can be developed in consultation with the working group and aligned to the needs of the closure plan.	Proposed Control
	Uncertainty around what our closure criteria are for the site.	Mine Closure Completion Criteria	003: **Development of Completion Criteria** – Undertake a review of the completion criteria as part of the RMP review and incorporate the outcomes of this review in the preparation of the detailed mine closure plan.	Existing Control
	Poor Record and Document Management systems for closure.	Develop a document management process for closure	019: **Document and Records Control Management System** – Develop an appropriate Document and Records Control Management System to be used during the detailed mine closure planning process. The purpose it to keep all evidence to demonstrate and verify closure objectives have been meet. As part of the setup review the existing records that are relevant to relinquishments so that they can be brought into the systems and the value of this work is not lost.	Proposed Control
			029: **Develop Mine Closure Risk Register** and undertake periodic risk assessment reviews.	

Session	Risk	Critical Control	Actions	Status
	Delay in relinquishment or retention of licenses and consent conditions [project approvals, EPL, radiation, etc]	Strategy to relinquish all other approvals and licences	025: **Approvals/Licences Relinquishment Strategy** – Develop a relinquishment strategy for all relevant approvals, consents, and licences. This is in addition to the tenement requirements.	Proposed Control
Rehabilitation establishment, materials & resources	Less than adequate understanding of the PAF/NAF materials balance to achieve suitable rehabilitation outcomes.	Review records to development of a historical dumping plan to demonstrate that PAF material has been appropriately managed	049: **Review historical PAF** management practices & compile rehabilitation signoff evidence – Consider targeted investigations where appropriate, draw on site experience, review historical dumping plans and records, and photo records. Develop a data set that can be used in the mine closure plan and ESF2 to demonstrate that the PAF material has been managed appropriately during mining operations. 086: **PAF management procedure** – Review the current processes being undertaken at the site and review and update with specific reference to mine closure outcomes. Use this review to develop a PAF management procedure that documents the requirements for the management of PAF at the site(s) as they move towards closure.	Proposed Control
Rehabilitation establishment, materials & resources	Poor stockpiling of topsoil and handling has resulted in loss or impact on the physical properties of the soil.	Rehabilitation Methods SOPs	051: **Rehabilitation Methods SOPs** – Current rehabilitation practices have been refined over time with experience at the site however there is currently no documented methods statement or SOP in place. Develop a Rehabilitation Methods SOP document to include the processes specific for the site(s). This could include, but not be limited to: - Topsoil stripping and handling - rehab materials stockpiling and mass balance - habitat material salvage - Rehabilitation timing - Surface preparation - Topsoil spreading and allocation of topsoil - Spreading and addition of ameliorants - Seed selection - Seed purchase and storing - Seed application. - supervisor and operator training - design specifications for water infrastructure, etc	Proposed Control

Session	Risk	Critical Control	Actions	Status
			The document also needs include requirements for records that will be used to support the rehabilitation process and verify that the methodology used is appropriate. This information should be included in the document control system.	
Final Landform	The approved Final Void [location and profile] are not able to be achieved and relinquished.	Establishment of a preferred final void design to make sure they are long term stable and can then be taken forward into the mine closure planning for the sites(s)	052: **Final Voids Strategy** – Undertake a study to review the preferred final void design which can be taken forward to the Regulator for agreement on relinquishment criteria. I.e. to add clarity to the definition of "safe, stable and non-polluting" and give certainty to achieving signoff status and residual risks. The assessment should include, but not be limited to: - overarching strategy – non-spill or flow through system; - detailed geotechnical design parameters agreeing on FoS; - erosion modelling completed on the designs; - review the areas available to enable treatment [approval boundaries]; - offsets and creeks; - cut and fill versus backfill and look at the cost benefits; - review the constructed landforms and the impact they have on achieving the preferred final void outcome; - review these keys assumptions that feed into the final void design; - review what impact the preferred final void will have on what water infrastructure can be retained and what the design parameters should be adopted to ensure long term stability; - review the surface and groundwater models, including fill and spill and water quality; and - establish success criteria for the final voids. 059: **Surface water infrastructure design review** – Review the current surface water infrastructure that will be retained post-mining and review the initial design parameters to make sure are functioning as designed and that they are long term stable. Where required propose mitigation or additional works to ensure long term stable post closure. 053 **Final Void water balance** - Review the post-mining surface and groundwater models and understand the impacts of the preferred final void	Proposed Control

Session	Risk	Critical Control	Actions	Status
			design. Prepare an updated final void water balance. This assessment is to include a review of the potential fill and spill scenarios along with a review of the resulting water quality and mitigation that may be required.	
Final Landform	Less than adequate design of final proposed highwalls [and low walls] for the final voids.	Establishment of a preferred final void design to make sure they are long term stable and can then be taken forward into the mine closure planning for the sites(s)	See Action No. 052 **Final Void Strategy**	Proposed Control
Final Landform	Less than adequate post mining GW recovery model or the model relies on poor assumptions.	Establishment of a preferred final void design to make sure they are long term stable and can then be taken forward into the mine closure planning for the sites(s)	See Action No. 052 **Final Void Strategy &** 053 **Final Void water balance**	Proposed Control
Final Landform	Less than adequate understanding of the final void(s) water quality and whether the voids will fill and spill.	Establishment of a preferred final void design to make sure they are long term stable and can then be taken forward into the mine closure planning for the sites(s)	See Action No. 052 **Final Void Strategy**	Proposed Control

Session	Risk	Critical Control	Actions	Status
Final Landform	Less than adequate landform design parameters consistent with the approved final landform	ID the key studies that impact the final landform and ensure that the outcomes are feedback into landform design	085: **Detailed final landform design** – Review the existing final landform design and prepare a revised detailed final landform design considering all aspects of the current mine layout and the proposed post-mining land use. The assessment should include, but not be limited to: - detailed geotechnical design parameters, include geomorphology - erosion and runoff modelling completed on the designs - final waste mass balance - water infrastructure required in final landform - review the post-mining site water balance forecast	Proposed Control
Final Landform	Geotechnical stability of the final landform cannot be achieved	Review the design parameters to ensure that they meet appropriate factors of safety	See Action No. 085 **Detailed final landform design**	Proposed Control
Final Landform	Surface water infrastructures fails or results in long term maintenance requirements	Establishment of a preferred final void design to make sure they are long term stable and can then be taken forward into the mine closure planning for the sites(s)	See Action No. 052 **Final Void Strategy**	Proposed Control

Session	Risk	Critical Control	Actions	Status
Ecosystem establishment	The methodologies used to apply seed or plant tube stock is not appropriate and results in failure to achieve the preferred rehab outcome	Pull existing information into a consolidated spatial closure document system [re historical records]	077 **GIS data/records of rehabilitation implementation** - (Closure evidence, ESF2) - Prepare a spatially referenced database of rehabilitation implementation at Stratford and Duralie including: - evidence of rehabilitation date, - landform design, - rehabilitation target domain, - target vegetation community, - reference to specific completion criteria. Review the existing GIS data that can be pulled into the document and records management system. Undertake a review of the quality of data to ensure that it is accurate for external reporting (Rehabilitation Portal)	Proposed Control

TABLE 2: SUMMARY OF DURALIE IMPORTANT CONTROLS AND ASSOCIATED ACTIONS

Session	Risk	Control	Actions	Status
Life of Mine and Closure Risks (General)	LTA Monitoring and Maintenance programs in place or not aligned to preferred post mining land use	Develop a mine closure monitoring and maintenance plan and estimate	021 **Monitoring & Maintenance Program** - Prepare a Monitoring and Maintenance Program as part of the Detailed Mine Closure Plan. This should be detailed in the existing Environmental Management Plans. Review the existing monitoring programs and align with and or add elements to specifically address the closure success criteria that are adopted for each CMA. This review should also include a review what elements of the existing monitoring system can cease when mining ceases.	Existing Control
Life of Mine and Closure Risks (General)	Ongoing off site environmental impacts	Environmental Monitoring and TARPs maintained to address closure criteria	023 **Review Environmental Management Plans for closure phase** - Undertake a review of the existing approved EMPs and update them as the site moves into closure. This review will not only include incorporating any aspects that are related to closure, but also removing operational requirements that are no longer applicable when the site is in closure. Consider monitoring and maintenance requirements during and after closure.	Existing Control
Life of Mine and Closure Risks (General)	Public safety risk of access to/ interaction the mine site including final voids	Public Safety Risk Assessment will be undertaken as part of the closure plan	028 **Public Safety Risk Assessment** - Complete a RA to assess any risks to the public during and post closure of the mine(s)	Proposed Control
Decom and Demolition	LTA assessment of the decom and demo requirements for the sites [including retention of assets]	Demolition and Decom plan	033 **Decommissioning & Demolition Plan** - Prepare a Decommissioning & Demolition Plan for the site which includes a list of all infrastructure to be removed, assessment of waste streams and volumes, consideration of hazmat [i.e.. asbestos, radiation sources, etc]. Include a management and maintenance strategy for any assets that are retained. This could include a long term strategy for the assets.	Proposed Control
Decom and Demolition	Failure to identify and rehabilitate exploration boreholes	Physical inspections of the known exploration borehole sites	035 **Exploration inspection program** - Undertake a program to inspect a representative sample of the rehabilitated exploration boreholes sites to gather evidence that the work has been completed to a satisfactory standard	Proposed Control

Session	Risk	Control	Actions	Status
Decom and Demolition	LTA planning on what surface water features that will be retained at closure	ID what water infrastructure will be required longer term	038 • **Water Management Infrastructure retention strategy**	Proposed Control
Decom and Demolition	LTA planning for the waste streams that will result from the Decom and demo activities (increased costs, impact on environment)	ID waste that requires remediation and develop a strategy for either off site or on-site disposal	041 **Closure waste management plan** - Develop a strategy to manage the waste streams generated by the demolition of site infrastructure. This is to include identifying a suitable licensed disposal option and the use of appropriately licensed contractors to manage the waste transfer and disposal.	Proposed Control
Decom and Demolition	Areas of land contamination are not identified resulting on unplanned costs or off site impacts	PSI and further contamination investigations to ID and quantify the material to be managed as part of a remediation action plan	042 **Contaminated Sites Assessment** - Complete a Land Quality Assessment for the site which aims to identify any contaminated sites, undertake intrusive investigations, and prepare Remediation Action Plans for the identified sites.	Proposed
Rehabilitation establishment, materials & resources	Lack of rehabilitation topsoil required to achieve rehabilitation outcomes	Topsoil Mass Balance which is reviewed every 12 months. Accurate measures of material required.	050 **LOM Rehab Materials Register & Mass Balance** - Develop a rehabilitation materials register including topsoil, clay and rock. Undertake a review of the rehabilitation materials required (eg. topsoil, rock, clay, etc) and compare that the material available in stockpile or available to be recovered from the remaining mining areas.	Existing Control
Final landform	LTA rehabilitation of PAF waste emplacements causing AMD contamination of surface and ground water	PAF material is placed in the dumps below the predicted post mining GW levels	064 **PAF/NAF Placement Model -** Undertake a Life of Mine review of the dumped PAF levels and develop a model that shows with a high level of confidence what the RLs are of the PAF below the predicted groundwater level.	Proposed Control

Session	Risk	Control	Actions	Status
Final landform	Geo technical stability of the final landform cannot be achieved	Undertake erosion modelling on the landforms to demonstrate long term stability of the designs	056 **Review application of erosion modelling** - Identify landforms on the site(s) that represent typical sites and complete erosion modelling for these locations to demonstrate that the current design criteria is appropriate. In addition to the representative sites apply the erosion model on sites that are considered high risk across the site.	Proposed Control
Final landform	Geo technical stability of the final landform cannot be achieved	Implement a document control and records keeping demonstrating that works completed as designed [ESF2]	058 **Document control & Records** - Implement a document control and records keeping to demonstrate that works completed as designed [ESF2].	Proposed Control
Final landform	Inability to achieve a long-term stable design for the reinstated creek diversion [Coal shaft creek]	Detailed coal shaft creek reconstruction design	067 **Coal Shaft Creek diversion design** - Complete the detailed design of the creek diversion.	Proposed Control
Final landform	LTA QA/QC process in place or poor record keeping to demonstrate that the constructed landforms meet the approved criteria	QA/QC process around demonstrating that the landforms have been built to the approved design	057 **Development of a QA/QC process for landform design** - Develop and implement a QA/QC process around demonstrating that the landforms have been built to the approved design.	Proposed Control
Other Mine Closure Risks	LTA consideration of Aboriginal heritage items during closure execution [including consultation with the key stakeholders]	Existing heritage management plans at both sites.	081 **Management of Heritage Sites** - Undertake consultation with the RAPs to resolve the long-term management of the known Aboriginal heritage sites as part of the preparation of the detailed mine closure plan.	Existing Control

TABLE 3 – RISK WORKSHOP ATTENDEES

Name	Position	Company	Session
Andrew Hutton	Managing Director/Principal Consultant	IEMA	All
Rhys Williams	Senior Environmental Consultant	IEMA	All
Tawna Ryan	Environmental Consultant	IEMA	1,2,3
John Cullen	Operations Manager	Stratford Coal	All
Nathan Vaughan	Mine Planning Superintendent	Stratford Coal	1,3,4,5,6, and 7
Todd Hutchings	Coal planning Superintendent	Stratford Coal	1,3,4,5,6, and 7
Mike Plain	Environment & Community Superintendent	Stratford Coal	All
Mick Bird	Mining Supervisor	Stratford Coal	1,3,4,5,6
Jeff Torkington	Chief Mining Engineer	Yancoal	As required
Andrew Lau	Mine Closure Manager	Yancoal	All
Michael Moore	Manager - Environmental Standards	Yancoal	All
Alan Andrews	Manager - Property	Yancoal	1 and 2
Thomas Holz	Manager - Tenements & Land Access	Yancoal	1 and 2
Scott Fittler	Stakeholder	Yancoal	1
Steve Lloyd	Accountant	Stratford Coal	1
Alexander Wellings	Stat Mechanical Engineer	Managed Contractor	1 and 2
Bruce Robinson	CHPP/ Stat Electrical Engineer	Stratford Coal	2
Ron Farley	Mechanical Reliability Coordinator	Stratford Coal	2
Paul Kellner	Infrastructure & Projects Supervisor	Stratford Coal	1 and 2
Brett Crouch	Maintenance Superintendent	Stratford Coal	2
Leonie Taylor	Health Safety Training Superintendent	Stratford Coal	1
Olivia Hall	Human Resources Advisor	Yancoal	1

ATTACHMENT 1 -RISK ASSESSMENT ACTION PLAN

Risk Assessment Actions	Corresponding TAP Actions	Target Completion Date
003: **Development of Completion Criteria** – Undertake a review of the completion criteria as part of the RMP review and incorporate the outcomes of this review in the preparation of the detailed mine closure plan.		30 June 2022
004**:** **Develop the Human Resources Strategy** - Ensure that a representative from HR is involved in the Mine Closure working group so that the HR strategy can be developed in consultation with the working group and aligned to the needs of the closure plan.		Initially by 1 August 2022 with ongoing review and refinement
007: **Mine Closure Stakeholder Strategy** – Develop the Mine Closure Plan Stakeholder Strategy which will include a list of all relevant stakeholders, how they will be engaged with and when. In addition, this should include a consultation log which is a record of the engagement along with any outcomes and actions.		Initially by 30 June 2022 with ongoing review and refinement
009: **Socio-economic Impact Assessment** – Scope and prepare a study that is an assessment of the impact on the local community as a result of closure of the mines. There should be a focus on capacity building to ensure sustainability beyond closure of the mine.		Initially by 31 December 2022 with ongoing review and refinement
019: **Document and Records Control Management System** – Develop an appropriate Document and Records Control Management System to be used during the detailed mine closure planning process. The purpose it to keep all evidence to demonstrate and verify closure objectives have been meet. As part of the setup review the existing records that are relevant to relinquishments so that they can be brought into the systems and the value of this work is not lost.	9	30 June 2022
021: **Monitoring & Maintenance Program** - Prepare a Monitoring and Maintenance Program as part of the Detailed Mine Closure Plan. This should be detailed in the existing Environmental Management Plans. Review the existing monitoring programs and align with and or add elements to specifically address the closure success criteria that are adopted for each CMA. This review should also include a review what elements of the existing monitoring system can cease when mining ceases.		30 June 2022 with ongoing review and refinement
023**:** **Review Environmental Management Plans for closure phase** - Undertake a review of the existing approved EMPs and update them as the site moves into closure. This review will not only include incorporating any aspects that are related to closure, but also removing operational requirements that are no longer applicable when the site is in closure. Consider		Completed. Periodic review and refinement

Risk Assessment Actions	Corresponding TAP Actions	Target Completion Date
monitoring and maintenance requirements during and after closure.		
025: **Approvals/Licences Relinquishment Strategy** – Develop a relinquishment strategy for all relevant approvals, consents, and licences. This is in addition to the tenement requirements.		31 October 2022 with ongoing review and refinement
028: **Public Safety Risk Assessment** - Complete a RA to assess any risks to the public during and post closure of the mine(s)		30 September 2022 with ongoing review and refinement
029: **Develop Mine Closure Risk Register** and undertake periodic risk assessment reviews.		Completed – periodic review
033: **Decommissioning & Demolition Plan** - Prepare a Decommissioning & Demolition Plan for the site which includes a list of all infrastructure to be removed, assessment of waste streams and volumes, consideration of hazmat [i.e. asbestos, radiation sources, etc.]. Include a management and maintenance strategy for any assets that are retained. This could include a long-term strategy for the assets.		31 October 2022 with ongoing review and refinement
035: **Exploration inspection program** - Undertake a program to inspect a representative sample of the rehabilitated exploration boreholes sites to gather evidence that the work has been completed to a satisfactory standard.		31 December 2022 with ongoing review and refinement
038: **Water Management Infrastructure retention strategy.**	6	31 March 2023
041: **Closure waste management plan** - Develop a strategy to manage the waste streams generated by the demolition of site infrastructure. This is to include identifying a suitable licensed disposal option and the use of appropriately licensed contractors to manage the waste transfer and disposal.		31 October 2022 with ongoing review and refinement
042: **Contaminated Sites Assessment** - Complete a Land Quality Assessment for the site which aims to identify any contaminated sites, undertake intrusive investigations, and prepare Remediation Action Plans for the identified sites.		31 October 2022 (PSI level) Detailed assessment in late 2022.
049: **Review Historical PAF** management practices & compile rehabilitation signoff evidence – Consider targeted investigations where appropriate, draw on site experience, review historical dumping plans and records, and photo records. Develop a data set that can be used in the mine closure plan and ESF2 to demonstrate that the PAF material has been managed appropriately during mining operations.	2	30 June 2023, during closure execution

Risk Assessment Actions	Corresponding TAP Actions	Target Completion Date
050: **LOM Rehab Materials Register & Mass Balance** - Develop a rehabilitation materials register including topsoil, clay and rock. Undertake a review of the rehabilitation materials required (e.g. topsoil, rock, clay, etc.) and compare that the material available in stockpile or available to be recovered from the remaining mining areas.		30 June 2022 with annual review
051: **Rehabilitation Methods SOPs** – Current rehabilitation practices have been refined over time with experience at the site however there is currently no documented methods statement or SOP in place. Develop a Rehabilitation Methods SOP document to include the processes specific for the site(s). This could include, but not be limited to: - Topsoil stripping and handling - rehab materials stockpiling and mass balance - habitat material salvage - Rehabilitation timing - Surface preparation - Topsoil spreading and allocation of topsoil - Spreading and addition of ameliorants - Seed selection - Seed purchase and storing - Seed application. - supervisor and operator training - design specifications for water infrastructure, etc. The document also needs include requirements for records that will be used to support the rehabilitation process and verify that the methodology used is appropriate. This information should be included in the document control system.	8	30 September 2022 with ongoing review and refinement
052: **Final Voids Strategy** – Undertake a study to review the preferred final void design which can be taken forward to the Regulator for agreement on relinquishment criteria. I.e. to add clarity to the definition of “safe, stable and non-polluting” and give certainty to achieving signoff status and residual risks. The assessment should include, but not be limited to: - overarching strategy – non-spill or flow through system; - detailed geotechnical design parameters agreeing on FoS; - erosion modelling completed on the designs; - review the areas available to enable treatment [approval boundaries]; - offsets and creeks; - cut and fill versus backfill and look at the cost benefits; - review the constructed landforms and the impact they have on achieving the preferred final void outcome; - review these keys assumptions that feed into the final void design; - review what impact the preferred final void will have on what water infrastructure can be retained and what the design parameters should be adopted to ensure long term stability; - review the surface and groundwater models, including fill and spill and water quality; and - establish success criteria for the final voids	1,3	30 June 2022 with ongoing review and refinement

Risk Assessment Actions	Corresponding TAP Actions	Target Completion Date
053: **Final Void water balance** - Review the post-mining surface and groundwater models and understand the impacts of the preferred final void design. Prepare an updated final void water balance. This assessment is to include a review of the potential fill and spill scenarios along with a review of the resulting water quality and mitigation that may be required.	1,3	Completed. Ongoing review and refinement
056: **Review application of erosion modelling** - Identify landforms on the site(s) that represent typical sites and complete erosion modelling for these locations to demonstrate that the current design criteria are appropriate. In addition to the representative sites apply the erosion model on sites that are considered high risk across the site.	4,5,6	31 July 2022
057: **Development of a QA/QC process for landform design** - Develop and implement a QA/QC process around demonstrating that the landforms have been built to the approved design.	7,8	30 June 2022 with ongoing review and refinement
058: **Document control & Records** - Implement a document control and records keeping to demonstrate that works completed as designed [ESF2].	9	31 December 2022
059: **Surface water infrastructure design review** – Review the current surface water infrastructure that will be retained post-mining and review the initial design parameters to make sure are functioning as designed and that they are long term stable. Where required propose mitigation or additional works to ensure long term stable post closure.	1,6	31 March 2023 with ongoing review and refinement
064: **PAF/NAF Placement Model -** Undertake a Life of Mine review of the dumped PAF levels and develop a model that shows with a high level of confidence what the RLs are of the PAF below the predicted groundwater level.	2	31 March 2023 with ongoing review and refinement
067: **Coal Shaft Creek diversion design** - Complete the detailed design of the creek diversion.		30 November 2022 with ongoing review and refinement
077: **GIS data/records of rehabilitation implementation** - (Closure evidence, ESF2) - Prepare a spatially referenced database of rehabilitation implementation at Stratford and Duralie including: - evidence of rehabilitation date, - landform design, - rehabilitation target domain, - target vegetation community, - reference to specific completion criteria. Review the existing GIS data that can be pulled into the document and records management system. Undertake a review of the quality of data to ensure that it is accurate for external reporting (Rehabilitation Portal)	9	30 September 2023

Risk Assessment Actions	Corresponding TAP Actions	Target Completion Date
081: **Management of Heritage Sites** - Undertake consultation with the RAPs to resolve the long-term management of the known Aboriginal heritage sites as part of the preparation of the detailed mine closure plan.		Completed. Periodic review and refinement.
085: **Detailed final landform design** – Review the existing final landform design and prepare a revised detailed final landform design considering all aspects of the current mine layout and the proposed post-mining land use. The assessment should include, but not be limited to: - detailed geotechnical design parameters, include geomorphology - erosion and runoff modelling completed on the designs - final waste mass balance - water infrastructure required in final landform - review the post-mining site water balance forecast	1,3,4,7	30 June 2022 with ongoing review and refinement
086: **PAF Management Procedure** – Review the current processes being undertaken at the site and review and update with specific reference to mine closure outcomes. Use this review to develop a PAF management procedure that documents the requirements for the management of PAF at the site(s) as they move towards closure.		30 June 2022

ATTACHMENT B

CONSULTATION WITH KEY STAKEHOLDERS

Planning, Industry & Environment

Our ref: DOC22/540456-2
Your ref: MP08_0203

Mr Michael Plain
Environment and Community Superintendent
Stratford Coal Limited
michael.plain@yancoal.com.au

Dear Mr Plain

Duralie Coal Mine Extension Project (MP 08_0203) – Review of Rehabilitation Management Plan

I refer to the e-mail dated 30 June 2022 in which the Planning and Assessment Division (P&A) of the Department of Planning and Environment (the Department) invited Biodiversity and Conservation Division (BCD) to provide advice in relation to the Duralie Coal Mine Extension Project (MP 08_0203).

BCD has reviewed the Rehabilitation Management Plan (RMP) for the Duralie Coal Mine and notes that mining activities ceased on 31 December 2021. BCD recommends that the following changes are made to the RMP:

1) Update the Table of Contents to include page numbers for the 'List of Tables', 'List of Plates' and 'List of Figures'.
2) Table 6 'Proposed Rehabilitation Objectives and Rehabilitation Completion Criteria' for Domain A 'Native Ecosystem' refers (on pages 30 & 31) to the use of Landscape Function Analysis (LFA) as one of the ways that the success of rehabilitation will be measured. However, studies by Erskine *et al*. (2013) 'Opportunities and constraints of functional assessment of mine land rehabilitation' published in Mine Closure 2013, on pages 345 – 355: DOI: 10.13140/RG.2.1.3217.8088, suggest that the underlying assumptions of LFA are unlikely to be met on a post-mined landscape. This has led to other mines in the Hunter Valley, e.g., the Liddell Coal Mine, to replace LFA with soil chemical analysis and transects of waste dumps in its revised 'Biodiversity Management Plan'. BCD recommends that Duralie Coal Pty Ltd reassess the use of LFA in this monitoring process and either provides an assessment of why this technique is appropriate for inclusion in the monitoring of rehabilitation on the Duralie Coal Mine or provides details of an alternative methods to measure and gauge success of its rehabilitation of mined landscapes.

BCD's comments, above, supplement our recommendations for the revised Biodiversity Management Plan for the Duralie Coal Mine Extension Project. Recommendations for the Biodiversity Management Plan were provided in our letter dated 28 March 2022.

If you have any further questions in relation to this matter, please contact Robert Gibson, Senior Regional Biodiversity Conservation Officer, on 4927 3154 or via email at huntercentralcoast@environment.nsw.gov.au

Yours sincerely

STEVEN CRICK
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

14 July 2022

Our ref: OUT22/11103

Michael Plain

Email: michael.plain@yancoal.com.au

28 July 2022

Subject: Duralie Mine Extension (MP08_0203) – Rehabilitation Management Plan

Dear Michael

I refer to your request seeking advice from the Department of Planning and Environment – Water (the department) on preparation of a Rehabilitation Management Plan for the above matter. It is understood this consultation is in accordance with conditions of approval for the project.

The department has reviewed the draft plan and requests it be considered further to ensure relevant water legislation, policy and management requirements are addressed. The department has defined a range of outcomes relevant to assist in the preparation of Rehabilitation Management Plans and these are detailed in Attachment A.

The department acknowledges a number of documents that relate to finalising the Rehabilitation Management Plan are in preparation or will be commenced in the near future. Once completed the department would appreciate an opportunity to review these and the specific documents of interest are detailed in Attachment A.

Should you have any further queries in relation to this submission please do not hesitate to contact DPE Water Assessments at water.assessments@dpie.nsw.gov.au

Yours sincerely,

Liz Rogers
Manager, Assessments, Knowledge Division
Department of Planning and Environment: Water

Attachment A

Detailed advice regarding the Duralie Mine Extension – Rehabilitation Management Plan

1.0 Rehabilitation Management Plan Outcomes

The Rehabilitation Management Plan is recommended to be reviewed to achieve the following outcomes. These are intended to meet the department's legislative, policy and water management requirements.

- Sharing of water must protect the water source, its dependent ecosystems and basic landholder rights.
- Water sources, floodplains and dependent ecosystems are protected and restored.
- Activities within a water source should avoid or minimise land degradation, including soil erosion, compaction, geomorphic instability, contamination, and where possible land should be rehabilitated.
- The final Rehabilitation Management Plan is made electronically available on a public accessible website.
- A conceptual model/diagram clearly presents how the groundwater and surface water systems interact with the final landform. This is to be informed by recent environmental assessments/modelling reviews.
- The final design and location of surface drainage features achieves a stable landform and maintains or improves riparian corridor functioning. This is to be completed with reference to industry guidelines such as: "*Rehabilitation Manual for Australian Streams* (LWRRDC 2000)", "*Guideline: Works that interfere with water in a watercourse for a resource activity* (DNRME 2019)" and "*Guidelines for Controlled Activities on Waterfront Land* (2012)" or their latest versions.
- Dirty runoff catchment areas are rehabilitated and the conveyance of clean surface runoff downstream is maximised.
- Decommissioning of groundwater boreholes is in accordance with the "Minimum Construction Requirements for Water Bores in Australia (2020)".
- Ongoing water take by the final landform via interception, storage or diversion is quantified and complies with relevant approvals and licences under the *Water Management Act 2000* or a relevant exemption. Please note exemptions from the requirement to hold approvals under s.90 and 91 of the *Water Management Act 2000* for approved SSD/SSI projects will not apply once the project approval ceases. Therefore, any relevant water management works that are to be retained will need to obtain an approval prior to the development consent lapsing.
- Aquifer interference activities are designed to minimise ongoing water take and water quality impacts and meet the requirements of the NSW Aquifer Interference Policy.
- Final voids do not present a risk to important groundwater ecosystems and assets (groundwater dependent ecosystems, alluvial aquifers, and landholder bores).
- Final voids are designed to be sinks or to flow through the local groundwater system and need to be confirmed by a post-mining groundwater model.
- Residual risk to water sources is clearly understood and minimised. This is to include relevant assessment documentation and updated risk assessments to meet the requirements of the NSW Aquifer Interference Policy. Further detail can be found in

Fact Sheet 5 in Appendix C of the "*Guidelines for Groundwater Documentation for SSD/SSI Projects. Technical guideline* (DPE 2022)".

- A monitoring and review program is included to ensure the rehabilitation outcomes are met.

2.0 Groundwater Management

2.1 Recommendation

When available, submit documentation for review to assist in finalising the Rehabilitation Management Plan. This includes:

(i) the updated groundwater model report:

(ii) the final void water balance; and

(iii) the Life of Mine Review of the Potential Acid Forming (PAF) material disposal.

Explanation

(i) Further review and verification of the site groundwater model is being completed in relation to the refined final landform designs from December 2021. The model is to confirm that groundwater seepage rates to the final void is consistent with the approved completion criteria. Completion of the groundwater model review and groundwater assessment for closure is due in September 2022.

(ii) Further recalibration and verification of the final void water balance is being completed based on the refined landform from December 2021 to ensure the function of the final voids is consistent with the approved completion criteria. Completion of the final void water balance review is due in September 2022.

(iii) A Life of Mine review is being completed of the disposed PAF levels and to develop a model to show with a high level of confidence what the relative levels are of the PAF against the predicted equilibrated groundwater level. This report is due 31 March 2023.

3.0 Watercourse Management

3.1 Recommendation

When available, submit documentation for review to assist in finalising the Rehabilitation Management Plan. This includes the Coal Shaft Creek Reconstruction Plan.

Explanation

Detailed design of the Coal shaft Creek Reconstruction Plan is to be prepared in consultation with DPE Water and finalised towards the end of 2022. It is understood this plan is to manage the decommissioning of an existing diversion of Coal Shaft Creek and its replacement with a reconstructed channel.

End of Attachment

2 Biripi Way | PO Box 482
Taree NSW 2430

23 September 2022

Michael Plain
michael.plain@yancoal.com.au

Dear Michael

Duralie Coal Mine Rehabilitation Management Plan

Thank you for providing the opportunity for Council to review the Duralie Rehabilitation Management Plan, submitted by Yancoal. In general, Council is accepting of the detail and content of the plan subject to the following:

Biodiversity

Key issues in relation to biodiversity matters in mine closure design and implementation include:

- Final land uses involving the creation of stable native vegetation communities in the plans match the requirements of the consent and established commitments,
- Risks to rehabilitation are appropriately identified, considered and adaptively managed,
- Indicators and completion criteria are clearly defined and are appropriate (defining what rehabilitation success looks like),
- Rehabilitation timeframes are appropriate and include active work phases and monitoring phases, with adaptability to manage risks including rehabilitation trigger actions,
- Rehabilitation processes are appropriate and well-planned.

Council is satisfied that these key issues are considered and defined within both the Rehabilitation Management Plan.

After 2035 and the completion of the rehabilitation works, it is assumed that the land will be disposed. It is questioned whether there needs to be any mechanisms established that seek to preserve the restoration of native vegetation outside of the biodiversity offset areas so that any future occupier or owner does not clear this rehabilitated habitat. Consideration should be given to the appropriate mechanism that gives native vegetation communities in the closed mine sufficient protection.

Contamination

Should contamination be identified that requires remediation, remediation works may require relevant approvals to be obtained. It should be noted that MidCoast Council has a Contaminated Land Policy for the purposes of assessing if proposed remediation works are Category 1 remediation work: work needing consent or Category 2 remediation work: work not needing consent in accordance with State Environmental Planning Policy (Resilience and Hazards) 2021.

Yours faithfully,

Bruce Moore
Coordinator Major Assessment

Request
in relation to the submission by Yancoal
of the Draft Rehabilitation Management Plan
to the Duralie Community Consultation Committee
for consultation prior to
Duralie's Application for Departmental Approval
of a Rehabilitation Management Plan.

In accordance with Clause 4.1 of the CCC Guidelines, and with respect to Yancoal's intention to seek Departmental Approval to the important draft Rehabilitation Management Plan, and Yancoal's request to the CCC to contribute, I request that:-

- a Special Meeting of the Duralie Community Consultation Committee be convened to address the subjects and risks detailed in Issues 007 and 009 in Table 1 Mine Closure Planning – Action Plan and Schedule, and that
- the consultation components of the Special Meeting be facilitated by a person with behavioural science qualifications and expertise in socio-economic community matters and community consultation/facilitation, and that
- in addition to the established Duralie CCC Members, up to ten community members with varied community interests, expertise and contacts from within the wider Booral/Stroud/Monkerai/Wards River/Craven/Stratford /Stroud Road and Gloucester Communities be invited to attend the Special Meeting, and that
- the details in Issues 007 and 009 be the primary focus of the consultation component of the Special Meeting, and that
- the "*ongoing review and refinement*" noted in Yancoal's Mine Closure Plan and Schedule on page 2 Appendix 1 of the Draft RMP include outcomes from the Special Meeting underpinning the Objective to "*Minimise the adverse socio-economic effects associated with mine closure*".

The reasoning underpinning the above request is detailed in **APPENDIX A** that follows.

Kind regards

Brian Eastoe
Member
Duralie Community Consultation Committee

APPENDIX A

Over the last 20 years or so the major activator at the Duralie Mine has been the mine owners' successive interests in extracting coal in the most viable manner that maintains a discipline articulated in the various Project Approvals; and understandably so.

Now that the coal extraction has ceased, the dominant emphasis changes to the wider communities' short and long term interests in socially viable outcomes, and the mine owners' obligation becomes facilitating its exit from the mine in such a way that the outcome of the RMP will "*Minimise the adverse socio-economic effects associated with mine closure*."

On 16 and 17 August 2021 Yancoal undertook a Risk Management Workshop (**RMW**) at which 22 personnel addressed thirty (30) Mine Closure and Rehabilitation Issues.

Twenty-eight (28) of the thirty (30) issues addressed detailed and compressive Environmental Consent Conditions contained within Project Approval 08_0203, and that were specifically nominated in nine (9) of the ten (10) Rehabilitation Objectives listed in Table 12 of PA 08_0203.

Two (2) of the issues addressed the tenth (10^{th}) Rehabilitation Objective in Table 12 concerning ***Community***.

The draft RMW has clearly utilised the copious Mining Environmental data assembled by Yancoal over the twenty-odd years of the Duralie Mine to comprehensively address issues that formed the Environmental Conditions of Consent 08_0203.

However while there is very little detail in PA 08_0203 about specific community outcomes outside monetary contributions, the extracts from the Draft Rehabilitation Management Plan emphasise (see extract below) that there are significant risks in not reaching a credible response to the Consent Condition (08_0203) relating to "Community", - "*Minimise the adverse socio-economic effects associated with mine closure*."

While a moot point, attendance by CCC members at the RMW in August 2021 might have provided Yancoal with a faster path to finalisation of the Rehabilitation Management Plan than the current request for a Special Meeting of the CCC, so as to meet a "*Target Completion Date*" of 30 June 2022.

The provision of the Draft RMP to CCC members on 30 June 2022 provides a welcome expectation that the holding of the requested Special Meeting will be a means of contributing to the flagged "*ongoing review and refinement*" over the period leading up perhaps to a "Target Completion Date" 31 December 2022.

Extract from the Draft Duralie Rehabilitation Management Plan (Emphasis added)

LTA Community Engagement **which results in loss of reputation or loss of goods and services.**	Mine Closure Stakeholder **Engagement** Strategy [linked to the HR strategy]	007: Mine Closure Stakeholder Strategy – Develop the Mine Closure Plan Stakeholder Strategy which will include a **list of all relevant stakeholders**, **how they will be engaged with and when**. In addition, this should include a consultation log which is a record of the engagement along with any outcomes and actions.	Proposed Control
LTA assessment and **mitigation of the social impacts relating to closure of the mine**(s).	**Socio-economic** impact assessment which will include development of mitigation	009: **Socio-economic Impact Assessment** – Scope and prepare a study that is an assessment of the **impact on the local community** as a result of closure of the mines. There should be **a focus on capacity building** to ensure **sustainability beyond closure of the mine.**	Proposed Control

Some Potential Questions.

For 007 and 009 some preliminary questions (that a Special Meeting could identify/develop/conclude) include:-

1. How is the list of "all relevant stakeholders" to be prepared and what will be the sources/decision-makers of information gathering that leads to such a list?
2. How is the process of engagement developed – is it perhaps to be set out by say, IEMA personnel and imposed upon the community, or is it to be derived from a design emerging from the Local community itself? (A comparable *national example* of this question can be derived from the current National/Uluru recognition of the importance of including First Nations People in the design of matters that affect First Nations People).
3. What expertise is best to compile an assessment of the impact and interests of/on the local community? eg a sociologist and/or behavioural scientist and/or Tertiary Majors in Sociological/Public Economics, rather than, say, an environmental scientist, or a mining specialist.
4. How is the very important capacity building/sustainability outcome to be developed? Eg a humanities educated economist with employment/societal experience/qualifications rather than a production engineer/environmental scientist/mining specialist.
5. While "mitigation" is one important factor in a socio-economic assessment, socio economic impacts on a community are significantly more numerous than simply "mitigation", and considerably more complex – thus the importance of a sociologist/ behavioural scientist.

Finally, I have a problem with paragraph 2 on Page 36 which says – "*DCM Community Consultative Committee (CCC) for comment, **prior to submission** of the DCM MOP/RMP*", (my emphasis).

Past responses to several times when a question has been asked in a CCC meeting about access to reports before they are approved by the Department of Planning, so that CCC contributions could be included, the CCC has been repeatably advised that the Department's ruling is that the reports are not for viewing by CCC members before approval; an interpretation of the CCC Guidelines that is not shared by me.

Consequently, the second paragraph on page 36 is arguably factually incorrect. An accurate notation would be that "*Ongoing ~~consultation with~~ **advice to** the community and relevant stakeholders occurs via the CCC, DCM website, and DCPL's community hotline and response protocol*".

On page 37 of the Draft RMP it says that the current membership of the CCC is "*five local community representatives*". The current membership includes three local community representatives.