Department of Planning, Housing and Infrastructure

Our ref: SSD-10418-PA-46

Chris Lauritzen
General Manager Resource Development
Mach Energy Australia Pty Ltd
PO Box 407
Newcastle, NSW, 2300

23/07/2025

Mount Pleasant Optimisation Project – Rehabilitation Strategy

Dear Mr. Lauritzen

Thank you for submitting the Rehabilitation Strategy in accordance with Condition B89, Schedule 2 of the consent for the Mount Pleasant Optimisation Project (SSD-10418). I also acknowledge your response to the Department's review comments and request for additional information.

I note the Rehabilitation Strategy has been prepared in consultation with CPHR, Muswellbrook Shire Council and the NSW Resources Regulator; and contains the information required by the conditions of approval.

Accordingly, as nominee of the Planning Secretary, I approve the revised Rehabilitation Strategy (Rev. 04, July 2025).

You are reminded that if there are any inconsistencies between the Strategy and the conditions of approval, the conditions prevail.

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Charissa Pillay on 02 99944599.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments

As nominee of the Planning Secretary

MOUNT PLEASANT OPERATION

REHABILITATION STRATEGY

Document ID:	MP001-0000-H&S-PLN-0023		
Company:	MACH Energy Australia Pty Ltd		
Effective Date:		**Status:**	Issued for Approval
Endorsed By:	Lisa Richards	**Revision Number:**	04

MOUNT PLEASANT OPERATION REHABILITATION STRATEGY	
Name of Mine:	Mount Pleasant Operation
Rehabilitation Strategy Commencement Date:	
Rehabilitation Strategy Revision Dates and Version Numbers:	Version 04 – This version has been updated to address the requirements of Development Consent SSD 10418. This version addresses comments from DPHI, BCD (now CPHR) and MSC.
Name of Mine Operator:	MACH Energy Australia Pty Ltd
Name of Lease Holder:	MACH Energy Australia Pty Ltd and J.C.D Australia Pty Ltd

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1 INTRODUCTION

The Mount Pleasant Operation (MPO) is located in the Upper Hunter Valley of New South Wales (NSW), approximately 3 kilometres (km) north-west of Muswellbrook and approximately 50 km north-west of Singleton (Figure 1). The village of Aberdeen and locality of Kayuga are also located approximately 5 km north-northeast and 1 km north of the MPO boundary, respectively (Figure 1). The proponent of the MPO is MACH Energy Australia Pty Ltd (MACH Energy), which purchased the MPO from Coal & Allied Operations Pty Ltd (Coal & Allied) in 2016.

MACH Mount Pleasant Operations Pty Ltd is the manager of the MPO as agent for, and on behalf of, the unincorporated Mount Pleasant Joint Venture between MACH Energy (95 per cent [%] owner) and J.C.D. Australia Pty Ltd (5% owner). This Rehabilitation Strategy is implemented at the MPO by MACH Energy.

The initial development application for the MPO was made in 1997. This was supported by an Environmental Impact Statement (EIS) prepared by Environmental Resources Management (ERM) Mitchell McCotter (ERM Mitchell McCotter, 1997). On 22 December 1999, the then Minister for Urban Affairs and Planning granted Development Consent DA 92/97 to Coal & Allied. This allowed for the "Construction and operation of an open cut coal mine, coal preparation plant, transport and rail loading facilities and associated facilities" at the MPO. The consent allowed for operations 24 hours per day, seven days per week and the extraction of 197 million tonnes (Mt) of run-of-mine (ROM) coal over a 21 year period, at a rate of up to 10.5 Mt of ROM coal per year.

The Mount Pleasant Project Modification (MOD 1) was submitted on 19 May 2010 with a supporting Environmental Assessment (EA) prepared by EMGA Mitchell McLennan (EMGA Mitchell McLennan, 2010). MOD 1 included the provision of an infrastructure envelope for siting the mine infrastructure, the provision of an optional conveyor/service corridor linking the MPO facilities with the Muswellbrook-Ulan Rail Line and modification of the existing Development Consent DA 92/97 boundaries to accommodate the optional conveyor/service corridor and minor administrative changes. MOD 1 was approved on 19 September 2011.

The MPO South Pit Haul Road Modification (MOD 2) was submitted on 30 January 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017a). MOD 2 proposed to realign an internal haul road to enable more efficient access to the South Pit open cut, with no other material changes to the approved MPO. MOD 2 was approved on 29 March 2017.

The MPO Mine Optimisation Modification (MOD 3) was submitted on 31 May 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017b). MOD 3 comprised an extension to the time limit on mining operations (to 22 December 2026) and extensions to the South Pit Eastern Out of Pit Emplacement to facilitate development of an improved final landform. MOD 3 was approved on 24 August 2018.

The MPO Rail Modification (MOD 4) was submitted on 18 December 2017 with a supporting EA prepared by MACH Energy (MACH Energy, 2017c). MOD 4 proposed the following changes:

- duplication of the approved rail spur, rail loop, conveyor and rail load-out facility and associated services;
- duplication of the Hunter River water supply pump station, water pipeline and associated electricity supply that followed the original rail spur alignment; and
- demolition and removal of the redundant approved infrastructure within the extent of the Bengalla Mine, once the new rail, product loading and water supply infrastructure has been commissioned and is fully operational.


SCONE
ABERDEEN
MUSWELLBROOK
SINGLETON
Denman
Jerrys Plains
Mount Thorley
Kayuga
UPPER HUNTER SHIRE COUNCIL
MUSWELLBROOK SHIRE COUNCIL
SINGLETON COUNCIL
MOUNT PLEASANT OPERATION
Mount Pleasant
DARTBROOK
BENGALLA
MANGOOLA
MUSWELLBROOK
MT ARTHUR
MAXWELL INFRASTRUCTURE
MAXWELL UNDERGROUND
LIDDELL
MOUNT OWEN
RAVENSWORTH EAST
GLENDELL
RAVENSWORTH UNDERGROUND
RAVENSWORTH OPERATIONS
HUNTER VALLEY OPERATIONS NORTH
HUNTER VALLEY OPERATIONS SOUTH
ASHTON
INTEGRA
RIX'S CREEK NORTH
RIX'S CREEK
UNITED WAMBO OPEN CUT
WAMBO UNDERGROUND
WARKWORTH
MOUNT THORLEY
HUNTER RIVER
GOULBURN RIVER
NEW ENGLAND HIGHWAY
GOLDEN HIGHWAY
MUSWELLBROOK - ULAN RAIL LINE
MAIN NORTHERN RAILWAY
Lake Glenbawn
Lake Liddell
Liddell Ash Dam
Bayswater-Liddell Freshwater Dam
Bayswater Ash Dam
Plashett Reservoir
Ravensworth State Forest
Wollemi National Park
N
0
10
Kilometres
GDA2020 MGA Zone 56
Source: NSW Spatial Services (2025)
MOUNT PLEASANT OPERATION
NEW SOUTH WALES
MUSWELLBROOK
SINGLETON
NEWCASTLE
SYDNEY
WOLLONGONG
LEGEND
Mining Operation
Railway
Local Government Boundary
State Forest/Reserve
National Parks and Wildlife Estate
Mining Lease Boundary (Mount Pleasant Operation)
MACHEnergy
MOUNT PLEASANT OPERATION
Regional Location

Figure 1

MOD 4 was approved on 16 November 2018 by the Secretary of the Department of Planning and Environment (under Delegation). Appendix 2 of the modified Development Consent DA 92/97 illustrates the Conceptual Project Layout Plan of the approved MPO at 2021 and 2025, Approved Surface Disturbance Plan and Conceptual Final Landform (Attachment 1) incorporating the MOD 4 infrastructure relocations. Figure 2 shows the completed MOD 4 infrastructure components and relocations.

Modification 5 (MOD 5) was submitted to rectify an administrative error in Development Consent DA 92/97 and was approved by the Department of Planning and Environment (DPE) on 29 June 2022.

Modification 6 (MOD 6) was submitted to modify Development Consent DA 92/97 and was approved on 6 November 2023. MOD 6 will allow for the construction and operation of a re-transmission facility including a tower or mast, shed and associated transmission infrastructure to re-transmit local digital television (DTV) signals from the Broadcast Australia site at Rossgole Lookout. Appendix 2 of the modified Development Consent DA 92/97 illustrates the Revised Approved Surface Disturbance Plan incorporating the MOD 6 infrastructure (Attachment 1).

Separate to Development Consent DA 92/97, on 22 January 2021, MACH Energy submitted the Mount Pleasant Optimisation Project (the Project) EIS in support of a State Significant Development (SSD) 10418 under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act). Key aspects of the Mount Pleasant Optimisation Project generally involve (among other things):

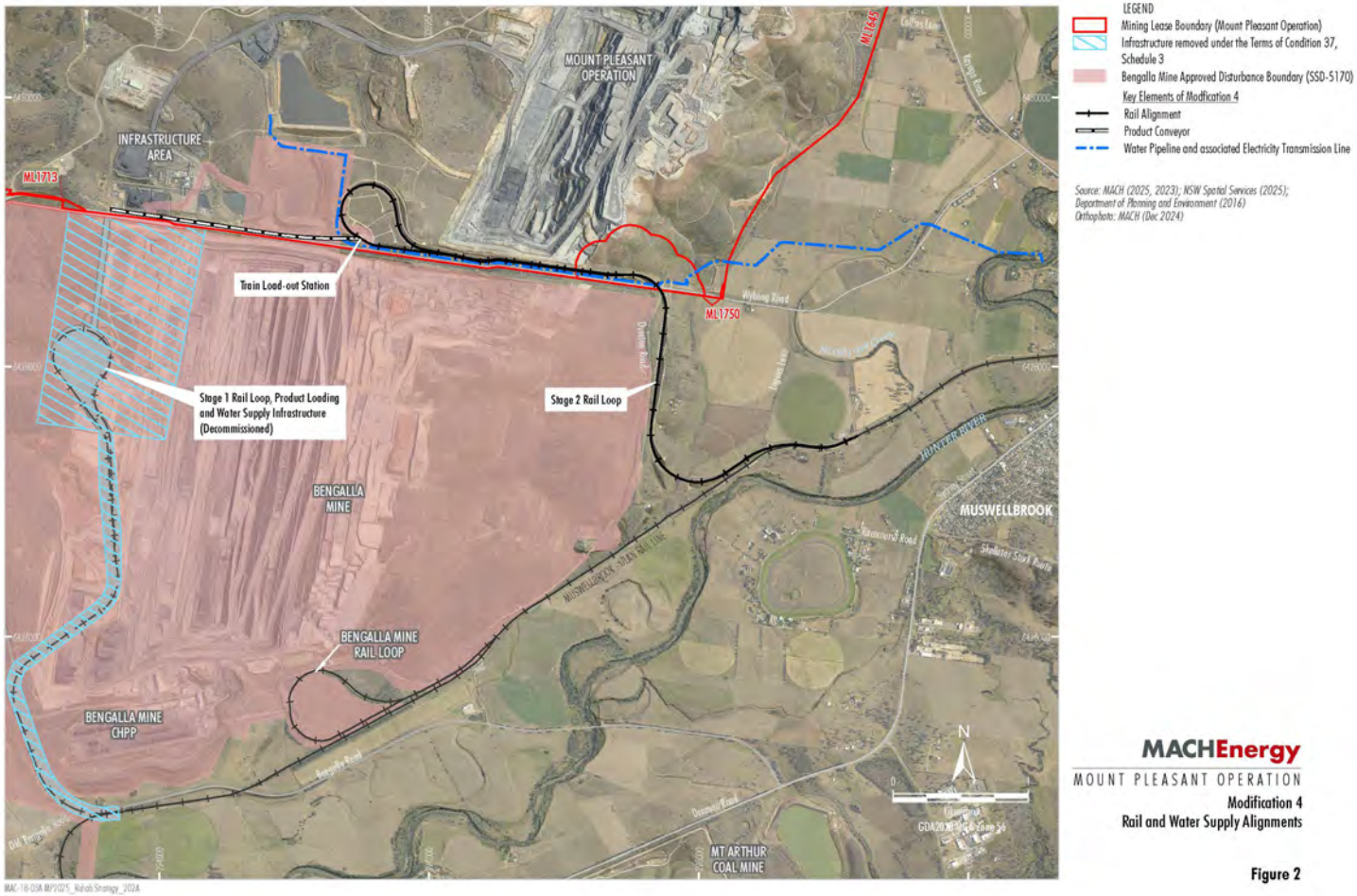
- increased open cut extraction within the MPO's existing mining leases (ML);
- a staged increase in extraction, handling and processing of ROM coal up to 21 million tonnes per annum (Mtpa);
- upgrades to existing infrastructure and new infrastructure to support mining of the proposed Project; and
- an extension to the time limit on mining operations to 22 December 2048.

The Project was approved by the NSW Independent Planning Commission on 6 September 2022. Part A, Condition A14 of Development Consent SSD 10418 requires the surrender of Development Consent DA 92/97 within 12 months of the date of commencement of development under Development Consent SSD 10418, or an alternative timeframe agreed with the Planning Secretary of the DPE (now the Department of Planning, Housing and Infrastructure [DPHI]). In accordance with Part A, Condition A14 of Development Consent SSD 10418, an alternative timeframe was agreed upon with the endorsement of the Planning Secretary. MACH Energy will surrender the existing Development Consent DA 92/97 on 12 February 2026. A copy of the time extension approval by the Planning Secretary is included as Attachment 2.

Attachment 3 describes the development layout of the Project in accordance with Development Consent SSD 10418.

Following the commencement of development under Development Consent SSD 10418 and prior to the surrender of Development Consent DA 92/97, MACH Energy will comply with the requirements of both consents (Section 1.1).

Figure 3 shows the indicative Project general arrangement and existing/approved surface development areas that would continue to comprise as part of the Project and the areas that would be relinquished.


MOUNT PLEASANT OPERATION
INFRASTRUCTURE AREA
ML1713
ML1445
ML1750
Train Load-out Station
Stage 1 Rail Loop, Product Loading and Water Supply Infrastructure (Decommissioned)
Stage 2 Rail Loop
BENGALLA MINE
BENGALLA MINE RAIL LOOP
BENGALLA MINE CHPP
MUSWELLBROOK
HUNTER RIVER
MT ARTHUR COAL MINE
Wybong Road
Denman Road
Bengalla Road
LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Infrastructure removed under the Terms of Condition 37, Schedule 3
Bengalla Mine Approved Disturbance Boundary (SSD-5170)
Key Elements of Modification 4
Rail Alignment
Product Conveyor
Water Pipeline and associated Electricity Transmission Line
Source: MACH (2025, 2023); NSW Spatial Services (2025); Department of Planning and Environment (2016)
Orthophoto: MACH (Dec 2024)
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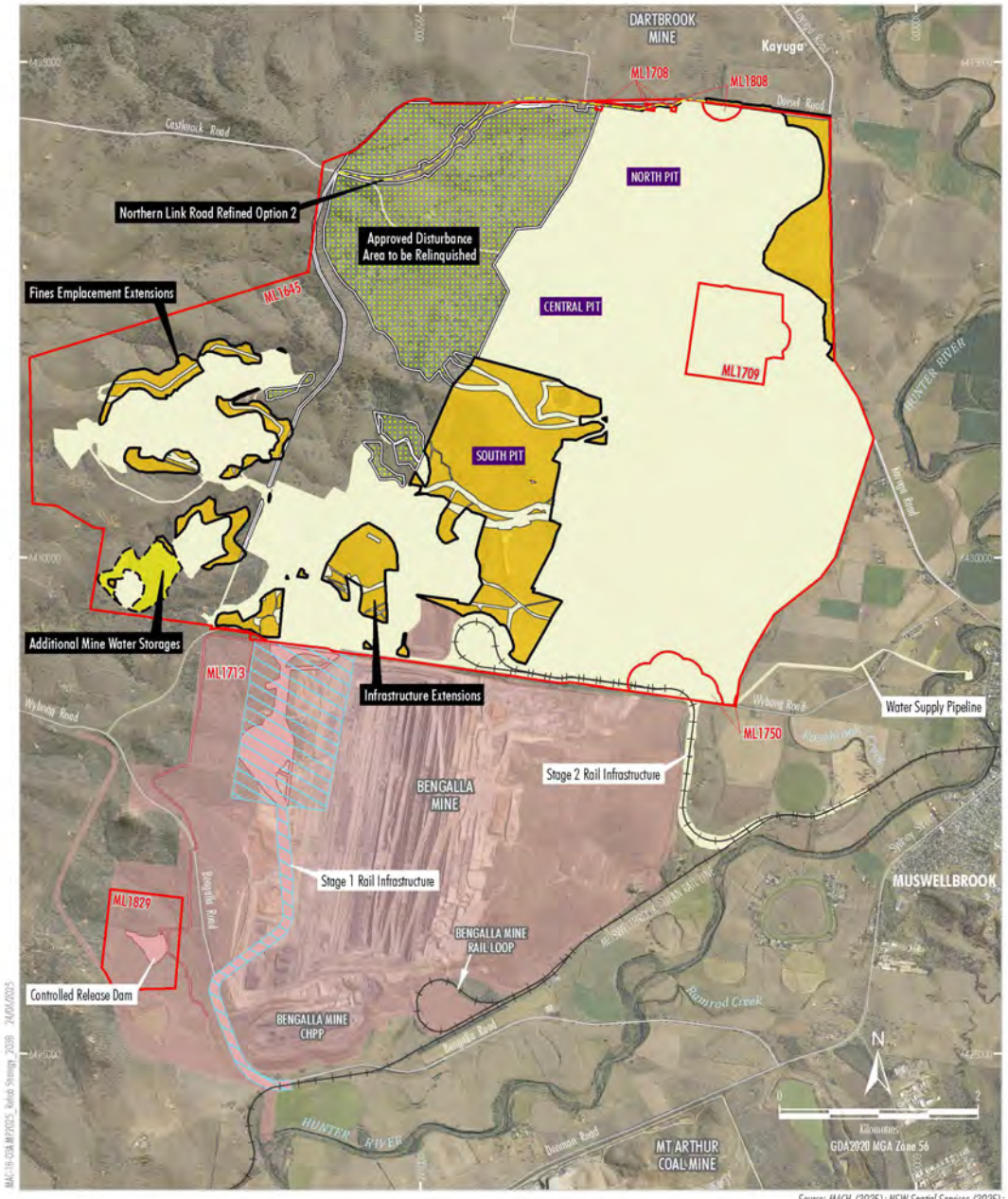
MOUNT PLEASANT OPERATION
Modification 4
Rail and Water Supply Alignments

Figure 2



LEGEND

- Railway
- Mining Lease Boundary (Mount Pleasant Operation)
- Project Continuation of Existing/Approved Surface Development (DA92/97) [1]
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)
- Existing/Approved Mount Pleasant Operation Infrastructure within Bengalla Mine Approved Disturbance Boundary (SSD-5170) [1]
- Infrastructure removed under the Terms of Condition 37, Schedule 3
- Development Footprint 1 (Stage 1) - General Extension Areas [1]
- Development Footprint 1 (Stage 2) - Mine Water Dam 3 [1]
- Northern Link Road Refined Option 2 Centreline
- Relinquishment Area [2]

NOTES

[1] Excludes some incidental Project components such as water management infrastructure, access tracks, topsoil stockpiles, power supply, temporary offices, other ancillary works and construction disturbance.

[2] Subject to detailed design of Northern Link Road alignment.

Source: MACH (2025); NSW Spatial Services (2025); Department of Planning and Environment (2016) Orthophoto: MACH (Dec 2024)

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MOUNT PLEASANT OPERATION

General Arrangement of the Project

Figure 3

1.1 PURPOSE AND SCOPE

This Rehabilitation Strategy has been prepared by MACH Energy to satisfy the requirements of Schedule 3, Condition 54 of Development Consent DA 92/97 (prior to its surrender) and Part B, Condition B89 of Development Consent SSD 10418. The role of this Rehabilitation Strategy, as well as the key components of the rehabilitation implementation and improvement methodology at the MPO, are shown on Figure 4.

The Rehabilitation Strategy applies to all employees and contractors at the MPO and covers all areas within the MPO boundary. The Rehabilitation Strategy applies to the life of the MPO, including (but not limited to) the period of mining operations specified in Development Consent SSD 10418, which permits mining until 22 December 2048. As required by Part A, Condition A5 of Development Consent SSD 10418, the Rehabilitation Strategy will continue to apply (excluding mining operations) beyond 22 December 2048, as required, until rehabilitation and any additional undertakings (required by the Planning Secretary of the DPHI, or the NSW Resources Regulator) have been carried out satisfactorily.

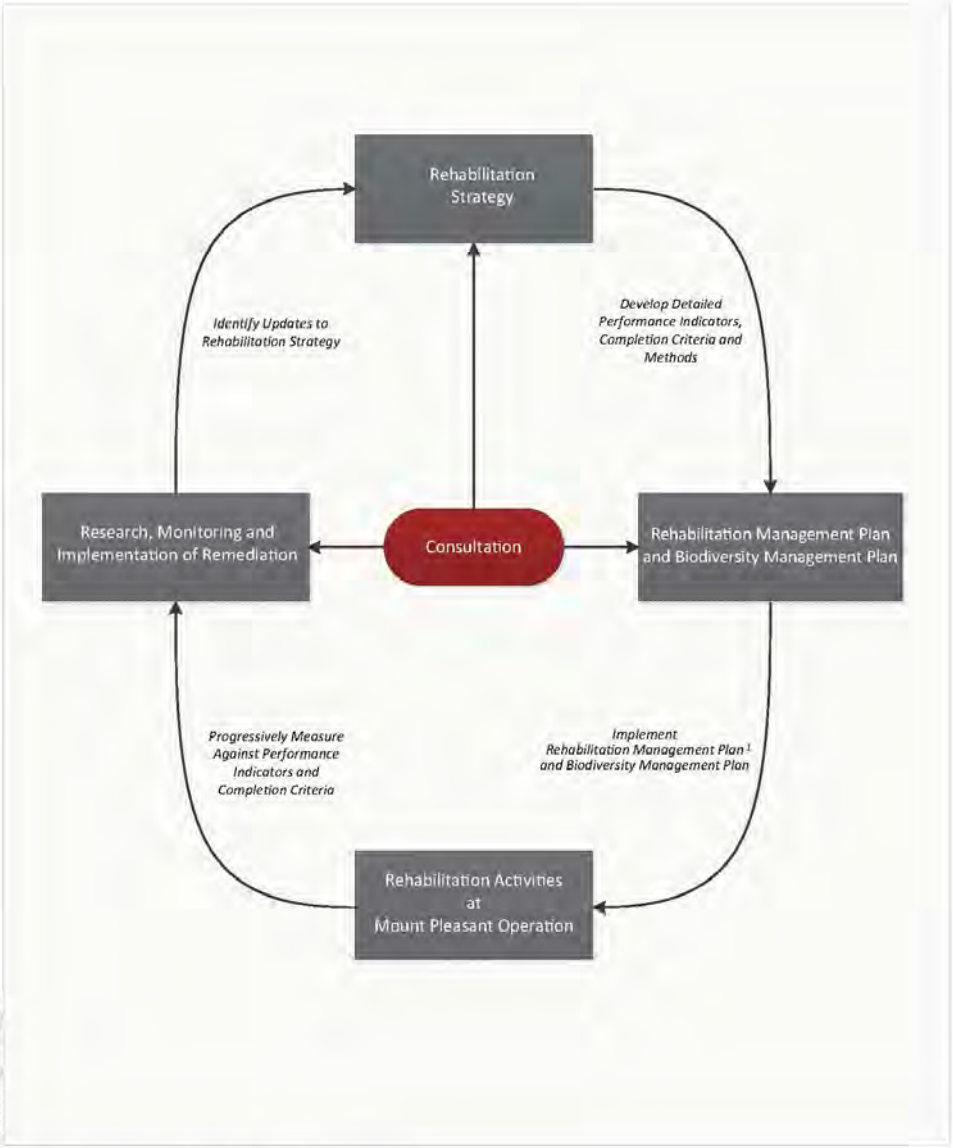
All conditions and statutory requirements under Development Consent DA 92/97 will become null and void after its surrender where the MPO will operate under Development Consent SSD 10418 and other relevant legislation listed in Part A, Condition A2 of Development Consent SSD 10418.

In accordance with Part B, Condition B89(b) of Development Consent SSD 10418, this Rehabilitation Strategy has been prepared and reviewed by Chloe Annandale, Senior Environmental Scientist at Landroc, who has been endorsed by the Planning Secretary as a suitably qualified and experienced person. A copy of the endorsement by the Planning Secretary is included in Attachment 4.

In accordance with Part B, Condition B90 of Development Consent SSD 10418, MACH Energy will not commence mining operations north of Castlerock Road until the Rehabilitation Strategy is approved by the Planning Secretary.

MACH Energy commenced development under Development Consent SSD 10418 on 12 February 2024. In accordance with Part A, Condition A15 of Development Consent SSD 10418, upon the commencement of development of Development Consent SSD 10418 and before the surrender of Development Consent DA 92/97, the conditions of Development Consent SSD 10418 prevail to the extent of any inconsistency with the conditions of those consents.

In accordance with Part B, Condition B89(a) of Development Consent SSD 10418, this Rehabilitation Strategy will be submitted for approval within 12 months of commencement of development under Development Consent SSD 10418. Once approved by the Planning Secretary, MACH Energy will implement the Rehabilitation Strategy in accordance with Part B, Condition B91 of Development Consent SSD 10418.



NOTE
[1] As of 1 August 2022, MPO operates under a Rehabilitation Management Plan, along with the supporting Annual Rehabilitation Report and Forward Program which has replaced the Mining Operations Plan (1 July 2021 - 30 June 2023).

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Key Components of Rehabilitation Implementation and Improvement Methodology
Figure 4

1.1.1 Previous Versions

A previous version of the Rehabilitation Strategy (Version 1) was submitted by Coal & Allied and was approved on 23 July 2012. MACH Energy prepared a 'Preliminary Rehabilitation Strategy' as part of the *Mount Pleasant Operation - Mine Optimisation Modification Response to Submissions* (MACH Energy, 2017d) for which this Rehabilitation Strategy has built upon to address Condition 54, Schedule 3 of Development Consent DA 92/97. The preliminary version of the Rehabilitation Strategy prepared by MACH Energy provided a contemporary outline of MACH Energy's proposed objectives and measures to implement rehabilitation at the MPO, following the approval of MOD 3/MOD 4, and was approved by the Department of Planning, Industry and Environment (DPIE) (now DPHI) on 16 May 2019.

Version 2 of the Rehabilitation Strategy was prepared to incorporate updates to maintain consistency with the MPO's Mining Operations Plan and Rehabilitation Management Plan (1 July 2021 – 30 June 2023) (herein referred to as 2021-2023 MOP/RMP), approved by the NSW Resources Regulator on 24 June 2021. However, as of 1 August 2022, MPO operates under a Rehabilitation Management Plan (RMP) along with the supporting Annual Rehabilitation Report and Forward Program which has replaced the 2021-2023 MOP/RMP.

Version 1 and 2 of the Rehabilitation Strategy was prepared in accordance with the requirements of the *ESG3: Mining Operations Plan (MOP) Guidelines* (Department Trade and Investment Regional Infrastructure and Services, 2013).

Consistent with the requirements of the NSW *Mining Amendment (Standard Conditions of Mining Leases) – Rehabilitation Regulation 2021*, enacted on 2 July 2021, MACH Energy prepared a RMP for the MPO by 2 July 2022 (or as otherwise agreed with the NSW Resources Regulator) in accordance with NSW Resources Regulator's relevant guidelines. Following submission of the MPO RMP by the NSW Resources Regulator, MACH Energy revised the Rehabilitation Strategy, as required, to maintain consistency between the documents.

Version 3 of the Rehabilitation Strategy was updated to maintain consistency with the latest MPO RMP (Version 2) and associated Annual Rehabilitation Report and Forward Program which was prepared in accordance with the NSW Resource Regulator Form and Way – *Rehabilitation Management Plan for Large Mines* (July 2021), under amendment to the *Mining Regulation 2016* under the *Mining Act 1992*.

Additionally, Version 3 of the Rehabilitation Strategy and associated figures were also updated to:

- include the mining lease boundary (ML 1829) which allows for the operation of water discharge infrastructure; and
- reflect the transfer of ML 1645 (south of Wybong Road) to Bengalla Mine and the status of activities under Schedule 3, Condition 37 of Development Consent DA 92/97.

1.1.2 Current Version

The current version of the Rehabilitation Strategy (Version 4) has been prepared to replace the previous versions prepared by MACH Energy (approved 18 March 2024) described in Section 1.1.1 and includes updates to reflect the approval of Development Consent SSD 10418.

This Rehabilitation Strategy has been prepared to satisfy the relevant conditions of both Development Consent SSD 10418 and Development Consent DA 92/97 (prior to its surrender).

As required in accordance with Part B, Condition B89(c) of Development Consent SSD 10418, a draft version of this Rehabilitation Strategy was submitted to the Biodiversity and Conservation Division within DPHI (BCD) (now NSW DCCEEW Environment and Heritage – Conservation Programs, Heritage and Regulation [CPHR]), NSW Resources Regulator and Muswellbrook Shire Council (MSC) for the purpose of consultation. Details of the consultation undertaken, and the outcome of that consultation is detailed in Appendix A.

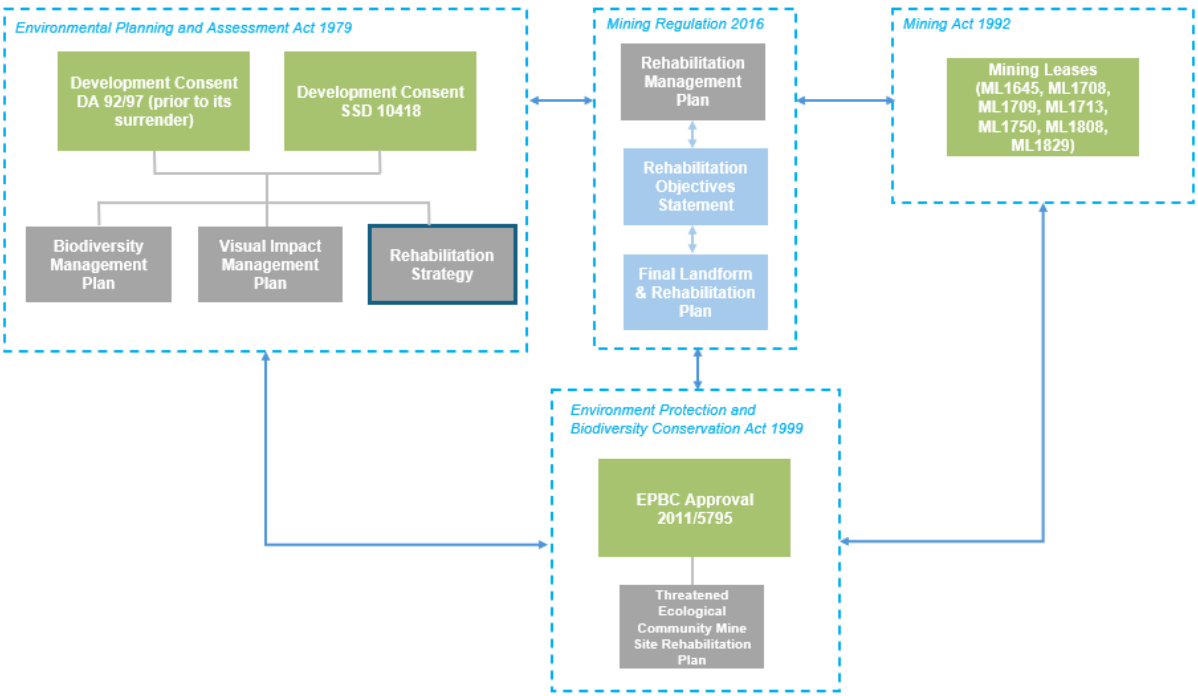
1.2 STRUCTURE OF THE REHABILITATION STRATEGY

The remainder of the Rehabilitation Strategy is structured as follows:

- Section 2: Outlines the statutory obligations relevant to this Rehabilitation Strategy.
- Section 3: Outlines the rehabilitation objectives.
- Section 4: Outlines the key rehabilitation strategies proposed at the MPO.
- Section 5: Provides an indicative schedule for rehabilitation and describes progressive rehabilitation at the MPO.
- Section 6: Describes the Post Mining Land Use Strategy.
- Section 7: Describes the Annual Review and continuous improvement process.
- Section 8: Describes the reporting procedures at the MPO.
- Section 9: Summarises the rehabilitation monitoring and research programme at the MPO.
- Section 10: Provides references used in this Rehabilitation Strategy.

Figure 5 identifies the relationship between the Rehabilitation Strategy and other documents.

Figure 5
Relationship between Rehabilitation Strategy and Other Documents



2 STATUTORY OBLIGATIONS

MACH Energy's statutory obligations are contained in:

- the conditions of Development Consent DA 92/97 (prior to its surrender);
- the conditions of Development Consent SSD 10418;
- the conditions of Commonwealth Approval EPBC 2011/5795;
- the conditions of Commonwealth Approval EPBC 2020/8735;
- relevant licences (including EPL 20850), permits and MLs (ML 1645, ML 1708, ML 1709, ML 1713, ML 1750, ML 1808 and ML 1829); and
- other relevant legislation.

In addition to the above, activities associated with the MPO will be undertaken with the licences, permits and leases described in the MPO Environmental Management Strategy (EMS).

In addition, MACH Energy operates in accordance with the approved MPO RMP and Annual Rehabilitation Report and Forward Program, as amended from time to time, which has replaced the Mining Operation Plan (as of 1 August 2022).

MACH Energy's statutory obligations relevant to the development of this Rehabilitation Strategy are described in the sections below.

2.1 DEVELOPMENT CONSENT DA 92/97

The conditions of Development Consent DA 92/97 (prior to its surrender) relevant to the content and structure of this Rehabilitation Strategy are described in Section 2.1.1 below.

2.1.1 Rehabilitation Strategy Requirements

Schedule 3, Conditions 53 to 55 of Development Consent DA 92/97, (in addition to the Statement of Commitments) outline the rehabilitation management required at the MPO, including the preparation of a Rehabilitation Strategy (refer Table 1).

Table 1
Rehabilitation Management Development Consent DA 92/97 Conditions

<table>
<tr><th>MPO Development Consent
DA 92/97</th><th>Section where addressed in this Rehabilitation Strategy document</th></tr>
<tr><td colspan="2">Schedule 3</td></tr>
<tr><td colspan="2">
Rehabilitation Objectives
53. The Applicant must rehabilitate the site in accordance with the provisions under the Mining Act, 1992. This rehabilitation must be generally consistent with the conceptual final landform depicted in Figure 4 in Appendix 2, and comply with the objectives in Table 11.
Table 11: Rehabilitation Objectives
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>All areas of the site affected by the development</td><td>• Safe, stable and non-polluting
• Fit for the intended post-mining land use/s</td></tr>
<tr><td>Areas proposed for native ecosystem re-establishment</td><td>• Restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area, as shown conceptually in Figure 4 in Appendix 2.
• Establish areas of self-sustaining:
- riparian habitat, within any diverted and/or re-established creek lines and retained water features;
- potential habitat for threatened flora and fauna species; and
- wildlife corridors, as far as is reasonable and feasible, and as shown conceptually in Figure 4 in Appendix 2.</td></tr>
<tr><td>Areas proposed for agricultural land</td><td>• Establish/restore grassland areas to support sustainable agricultural activities
• Achieve the nominated land capability classification</td></tr>
</table>
</td><td>Section 4

Section 4.3

Section 4.4</td></tr>
</table>

Table 1 (Continued)
Rehabilitation Management Development Consent DA 92/97 Conditions

MPO Development Consent DA 92/97		Section where addressed in this Rehabilitation Strategy document
Other land affected by the development	• *Restore ecosystem function, including maintaining or establishing self-sustaining ecosystems comprised of local native plant species (unless Resources Regulator agrees otherwise)*	Section 4.3
Final Landform	• *Stable and sustainable for the intended post-mining land use/s* • *Integrated with surrounding natural landforms* • *Incorporate micro-relief and drainage lines that are consistent with surrounding topography, to the greatest extent practicable* • *Maximise surface water drainage to the natural environment (excluding final void catchment)*	Section 4.2.4
Final voids	• *Designed as long term groundwater sinks to maximise ground water flows across back filled pits to the final void* • *Minimise to the greatest extent practicable:* - *the size and depth of final voids;* - *the drainage catchment of final voids;* - *any high wall instability risk; and* - *the risk of flood interaction*	Section 4.5
Surface infrastructure of the development	• *To be decommissioned and removed, unless the Resources Regulator agrees otherwise*	Section 4.2.1 and Section 4.6
Rehabilitation materials	• *Materials from areas disturbed under this consent (including topsoils, substrates and seeds) are to be recovered, managed and used as rehabilitation resources, to the greatest extent practicable*	Section 4.2.5
Water quality	• *Water retained on the site is fit for the intended post-mining land use/s* • *Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation*	Section 4.6
Community	• *Ensure public safety* • *Minimise adverse socio-economic effects associated with mine closure*	Section 4.7

Table 1 (Continued)
Rehabilitation Management Development Consent DA 92/97 Conditions

MPO Development Consent DA 92/97	Section where addressed in this Rehabilitation Strategy document
54. By the end of January 2019, unless otherwise agreed by the Secretary, the Applicant must prepare a Rehabilitation Strategy for the development to the satisfaction of the Secretary. This strategy must:	This document.
(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Secretary;	Section 1.1 and Attachment 4
(b) be prepared in consultation with the Resources Regulator and Council;	Section 1.1.2
(c) build upon the Rehabilitation Objectives in Table 11 and the conceptual final landform depicted in Figure 4 in Appendix 2, including identification of opportunities for increasing the areas of woodland and habitat connectivity within the rehabilitated landscape;	Section 3 and 4
(d) include details of the canopy, sub-canopy, understorey and ground strata species to be established in the rehabilitation areas, with a particular focus on ensuring the achievement of an appropriate level of diversity and mix of functional groups within each target community; and	Section 4.3 and 9.2
(e) include an indicative schedule for the staged rehabilitation of the development.	Section 5.3
(f) include a protocol for periodic trials to demonstrate that the proposed agricultural land capability of grassland areas in the final landform is being achieved; and	Section 9
(g) include a protocol for periodic trials to demonstrate that the target vegetation communities proposed in rehabilitated woodland areas and fauna habitat is being achieved.	Section 9
The Applicant must implement the approved strategy as approved from time to time by the Secretary.	
Progressive Rehabilitation	
55. The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable steps must be taken to minimise the total area exposed at any time. Interim stabilisation and temporary vegetation strategies must be employed when areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.	Section 5.1
Note: It is accepted that some parts of the site that are progressively rehabilitated may be subject to further disturbance at some later stage of the development.	
55A. The Applicant must implement all reasonable and feasible measures to provide for the interim stabilisation and temporary vegetation of the existing rail loop and infrastructure corridor, as soon as reasonably practicable following the removal of infrastructure as required under condition 37.	Section 5.2
Note: The Applicant's obligations under this condition will cease following the transfer or grant of a mining lease over that part of ML 1645 south of Wybong Road to the operator of Bengalla mine (or its nominee).	

Table 1 (Continued)
Rehabilitation Management Development Consent DA 92/97 Conditions

MPO Development Consent DA 92/97	Section where addressed in this Rehabilitation Strategy document
Statement of Commitments	
Redundant Infrastructure Removal in Bengalla Mine Footprint • *MACH Energy will stabilise redundant rail infrastructure areas within the footprint of the Bengalla Mine such that they do not pose an ongoing material source of dust emissions (i.e. seeding to establish a cover crop and/or application of a dust suppressant) prior to management of these areas being transferred to Bengalla Mine.* • *Existing Mount Pleasant Operation rail spur erosion and sediment control water management structures (e.g. sediment fences) within the footprint of Bengalla Mine will also be left in place, subject to agreement of Bengalla Mine.*	Section 5.2

2.2 DEVELOPMENT CONSENT SSD 10418

The conditions of Development Consent SSD 10418 relevant to the content and structure of this Rehabilitation Strategy are described in Section 2.2.1 below.

2.2.1 Rehabilitation Strategy Requirements

Part B, Conditions B87 to B91 of Development Consent SSD 10418, (in addition to the Statement of Commitments) outline the rehabilitation management required at the MPO, including the preparation of a Rehabilitation Strategy (refer Table 2).

Table 2
Rehabilitation Management Development Consent SSD 10418 Conditions

<table>
<tr><th>MPO Development Consent
SSD 10418</th><th>Section where addressed in this Rehabilitation Strategy document</th></tr>
<tr><td>Part B</td><td></td></tr>
<tr><td>
REHABILITATION
Rehabilitation Objectives
B87. The Applicant must rehabilitate the site in accordance with the provisions under the Mining Act 1992. This rehabilitation must be generally consistent with the proposed rehabilitation activities described in the document/s listed in condition A2(c) and shown conceptually in Appendix 6, and must comply with the objectives in Table 10.
Table 10: Rehabilitation objectives
<table>
<tr><th>Feature</th><th>Objective</th></tr>
<tr><td>All areas of the site affected by the development</td><td>• Safe, stable and non-polluting
• Fit for the intended post-mining land use/s
• Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations
• Minimise post-mining environmental impacts</td></tr>
<tr><td>Areas proposed for native ecosystem re-establishment</td><td>• Establish/restore self-sustaining native woodland ecosystems
• Establish local plant community types
• Establish:
- riparian habitat, within any diverted and/or re-established creek lines and retained water features;
- habitat, feed and foraging resources for threatened fauna species; and
- vegetation connectivity and wildlife corridors, as far as is reasonable and feasible</td></tr>
</table>
</td><td>Section 4

Section 4.3</td></tr>
</table>

MPO Development Consent SSD 10418		Section where addressed in this Rehabilitation Strategy document
Areas proposed for agricultural land	• *Establish/restore grassland areas to support sustainable agricultural activities* • *Re-establish agricultural land areas generally in accordance with the final landform plan (Appendix 6)* • *Use species found in the local area that are suitable for pasture production* • *Implement reasonable and feasible measures to rehabilitate agricultural land areas to LSC Class 3 to 4* • *Maintain the agricultural productivity and production of non-operational project-related land* • *Locate adjacent to surrounding agricultural land, where practicable*	Section 4.4
Final Landform	• *Stable for the intended post-mining land use/s* • *Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable* • *Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable* • *Maximise surface water drainage to the natural environment i.e. free draining (excluding final void catchment)* • *Minimise visual impacts, where practicable*	Section 4.2.4
Final void	• *Designed as long-term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final void (see condition B89)* • *Minimise to the greatest extent practicable having regard to post-mining beneficial land uses for the site:* - *the size and depth;* - *the drainage catchment;* - *any high wall instability risk; and* - *the risk of flood interaction* • *Maximise potential for beneficial reuse, where practicable*	Sections 4.5
Surface infrastructure of the development	• *To be decommissioned and removed, unless the Resources Regulator agrees otherwise*	Sections 4.2.1 and 4.6
Water quality	• *Water retained on the site is fit for the intended post-mining land use/s* • *Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation*	Section 4.6

MPO Development Consent SSD 10418		Section where addressed in this Rehabilitation Strategy document
Community	• *Ensure public safety* • *Minimise adverse socio-economic effects associated with mine closure*	Section 4.7
Note: *The rehabilitation objectives related to the establishment of native vegetation communities do not constitute an obligation for biodiversity offset purposes. Biodiversity offsets obligations in relation to development approved under this consent are regulated by conditions B55 to B61.*		
B88. The rehabilitation objectives in Table 10 apply to the entire site, including all landforms constructed under either this consent or previous consents. However, the Applicant is not required to undertake any additional earthmoving works on landforms that have been approved and constructed under previous consents, except where those earthworks are required for the establishment of a stable, non-polluting and free-draining landform.		Sections 3 and 4
Rehabilitation Strategy		This document.
B89. The Applicant must prepare a Rehabilitation Strategy for all land disturbed by the development to the satisfaction of the Planning Secretary. This strategy must:		
(a) be submitted for approval within 12 months of the commencement of development under this consent;		Section 1.1
(b) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;		Section 1.1 and Attachment 4
(c) be prepared in consultation with the BCD, Resources Regulator and Council;		Section 1.1.2
(d) build upon the Rehabilitation Objectives in Table 10, describe the overall rehabilitation outcomes for the site, and address all aspects of rehabilitation including mine closure, final landform (including final void), postmining land use/s and water management;		Sections 3 and 4
(e) align with strategic rehabilitation and mine closure objectives and address the principles of the Strategic Framework for Mine Closure (ANZMEC and MCA, 2000);		Section 4.1
(f) describe how the rehabilitation measures would be integrated with the measures in the Biodiversity Management Plan referred to in condition B63 and the Visual Impact Management Plan referred to in condition B77;		Sections 1.2, 4.8 and 4.9
(g) describe how rehabilitation will be integrated with the mine planning process, including a plan to address premature mine closure;		Section 4.7
(h) include indicative mine plans and scheduling for life-of-mine rehabilitation showing each rehabilitation domain;		Figures 6 to 13
(i) include details of target vegetation communities and species (including seed provenance) to be established within the proposed revegetation areas;		Section 4.3.1
(j) investigate opportunities to refine and improve the final landform and final void outcomes over time;		Sections 4.5, 7 and 9
(k) include a post-mining land use strategy to investigate and facilitate post-mining beneficial land uses for the site (including the final void), that:		Section 6
(i) align with regional and local strategic land use planning objectives and outcomes;		
(ii) support a sustainable future for the local community;		
(iii) utilise existing mining infrastructure, where practicable; and		
(iv) avoid disturbing self-sustaining native ecosystems, where practicable;		

MPO Development Consent SSD 10418	Section where addressed in this Rehabilitation Strategy document
(l) include a stakeholder engagement plan to guide rehabilitation and mine closure planning processes and outcomes;	Section 4.7
(m) investigate ways to minimise adverse socio-economic effects associated with rehabilitation and mine closure; and	Section 4.7
(n) include a program to periodically review and update this strategy at least every three years.	Section 7.2
B90. The Applicant must not commence mining operations north of Castlerock Road until the Rehabilitation Strategy is approved by the Planning Secretary.	Section 1.1
B91. The Applicant must implement the Rehabilitation Strategy approved by the Planning Secretary.	Section 1.1

2.2.2 Management Plan (General) Requirements

Part D, Condition D5 of Development Consent SSD 10418 outlines general management plan requirements. These are not applicable to this Rehabilitation Strategy as it is a Strategy document rather than an environmental management plan. A separate management plan (MPO RMP) will be prepared by MACH Energy in accordance with Part B, Condition B92 of Development Consent SSD 10418 to address the management of rehabilitation.

Under Part D, Condition D7 and D8 of Development Consent SSD 10418, MACH Energy is required to periodically review and update relevant strategies, plans and programs such that the environmental management measures are regularly updated and address any material changes arising from annual reviews, incidents, audits, modifications or the direction of the Planning Secretary. This will include, where relevant, this Rehabilitation Strategy. Review of the Rehabilitation Strategy is discussed in Section 7.2.

3 REHABILITATION OBJECTIVES

In accordance with Part B, Condition B87 of Development Consent SSD 10418, MACH Energy will rehabilitate the site in accordance with the provisions under the NSW *Mining Act 1992*. MACH Energy will rehabilitate the site to the satisfaction of the NSW Resources Regulator and the rehabilitation will be generally consistent with the proposed rehabilitation documents described in the documents listed in Part A, Condition A2(c) of Development Consent SSD 10418 and shown conceptually in Appendix 6 of Development Consent SSD 10418 (Attachment 3). The overarching rehabilitation objectives and measures for the MPO are detailed in Table 10 of Part B, Condition B87 of Development Consent SSD 10418 (as replicated in Table 3).

Table 3
Rehabilitation Objectives

Feature	Objective
All areas of the site affected by the development	• Safe, stable and non-polluting • Fit for the intended post-mining land use/s • Establish the final landform and post-mining land use/s as soon as practicable after cessation of mining operations • Minimise post-mining environmental impacts
Areas proposed for native ecosystem re-establishment	• Establish/restore self-sustaining native woodland ecosystems • Establish local plant community types • Establish: - riparian habitat, within any diverted and/or re-established creek lines and retained water features; - habitat, feed and foraging resources for threatened fauna species; and - vegetation connectivity and wildlife corridors, as far as is reasonable and feasible
Areas proposed for agricultural land	• Establish/restore grassland areas to support sustainable agricultural activities • Re-establish agricultural land areas generally in accordance with the final landform plan (Appendix 6 of SSD 10418) • Use species found in the local area that are suitable for pasture production • Implement reasonable and feasible measures to rehabilitate agricultural land areas to LSC Class 3 to 4 • Maintain the agricultural productivity and production of non-operational project-related land • Locate adjacent to surrounding agricultural land, where practicable
Final Landform	• Stable for the intended post-mining land use/s • Integrated with surrounding natural landforms and other mine rehabilitated landforms, to the greatest extent practicable • Incorporate micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable • Maximise surface water drainage to the natural environment i.e. free draining (excluding final void catchment) • Minimise visual impacts, where practicable

Table 3 (Continued)
Rehabilitation Objectives

Feature	Objective
Final void	• Designed as long-term groundwater sink to prevent the release of saline water into the surrounding environment, unless further mine planning and final landform design processes identify a more suitable outcome for the final void (see condition B89) • Minimise to the greatest extent practicable having regard to post-mining beneficial land uses for the site: - the size and depth; - the drainage catchment; - any high wall instability risk; and - the risk of flood interaction • Maximise potential for beneficial reuse, where practicable
Surface infrastructure of the development	• To be decommissioned and removed, unless the NSW Resources Regulator agrees otherwise
Water quality	• Water retained on the site is fit for the intended post-mining land use/s • Water discharged from the site is suitable for receiving waters and fit for aquatic ecology and riparian vegetation
Community	• Ensure public safety • Minimise adverse socio-economic effects associated with mine closure

In accordance with Part B, Condition B88 of Development Consent SSD 10418, the rehabilitation objectives in Table 3 apply to the entire site, including all landforms constructed under Development Consent SSD 10418 or Development Consent DA 92/97. However, MACH Energy is not required to undertake any additional earthmoving works on landforms that have been approved and constructed under previous consents, except where those earthworks are required for the establishment of a stable, non-polluting and free-draining landform.

The rehabilitation objectives in Schedule 3, Condition 53 of Development Consent DA 92/97 are largely consistent with those presented in Part B, Condition B87 of Development Consent SSD 10418. In accordance with Part A, Condition A15 of Development Consent SSD 10418, the rehabilitation objectives in Development Consent SSD 10418 prevail to the extent of any inconsistency with Development Consent DA 92/97. In addition, it is noted that the rehabilitation objectives in Development Consent SSD 10418 are more contemporary and robust than those in Development Consent DA 92/97.

Rehabilitation Objectives and Rehabilitation Completion Criteria under the Mining Regulation 2016

In addition to the overarching rehabilitation objectives specified in Development Consent SSD 10418, detailed rehabilitation objectives statements have been developed as required under the *Mining Regulation 2016*. The detailed rehabilitation objectives statements were submitted to the NSW Resources Regulator and approved on 29 May 2025. Accordingly, the RMP was amended to align with the rehabilitation objectives statement approved by the NSW Resources Regulator in accordance with clause 11, Schedule 8A of the *Mining Regulation 2016*.

As required under the *Mining Regulation 2016*, the detailed rehabilitation objectives statement and detailed completion criteria for each domain, including performance indicators and validation methods, are outlined within the RMP.

4 REHABILITATION STRATEGY

Sections 4.1 to 4.9 provide a description of rehabilitation strategies to address the objectives in Schedule 3, Condition 53 of Development Consent DA 92/97 (prior to its surrender) and Part B, Condition B87 of Development Consent SSD 10418. Rehabilitation will be undertaken in accordance with the approved MPO RMP. The approved plans showing indicative mining and rehabilitation progression are included as Figures 6 to 13.

4.1 STRATEGIC FRAMEWORK FOR MINE CLOSURE

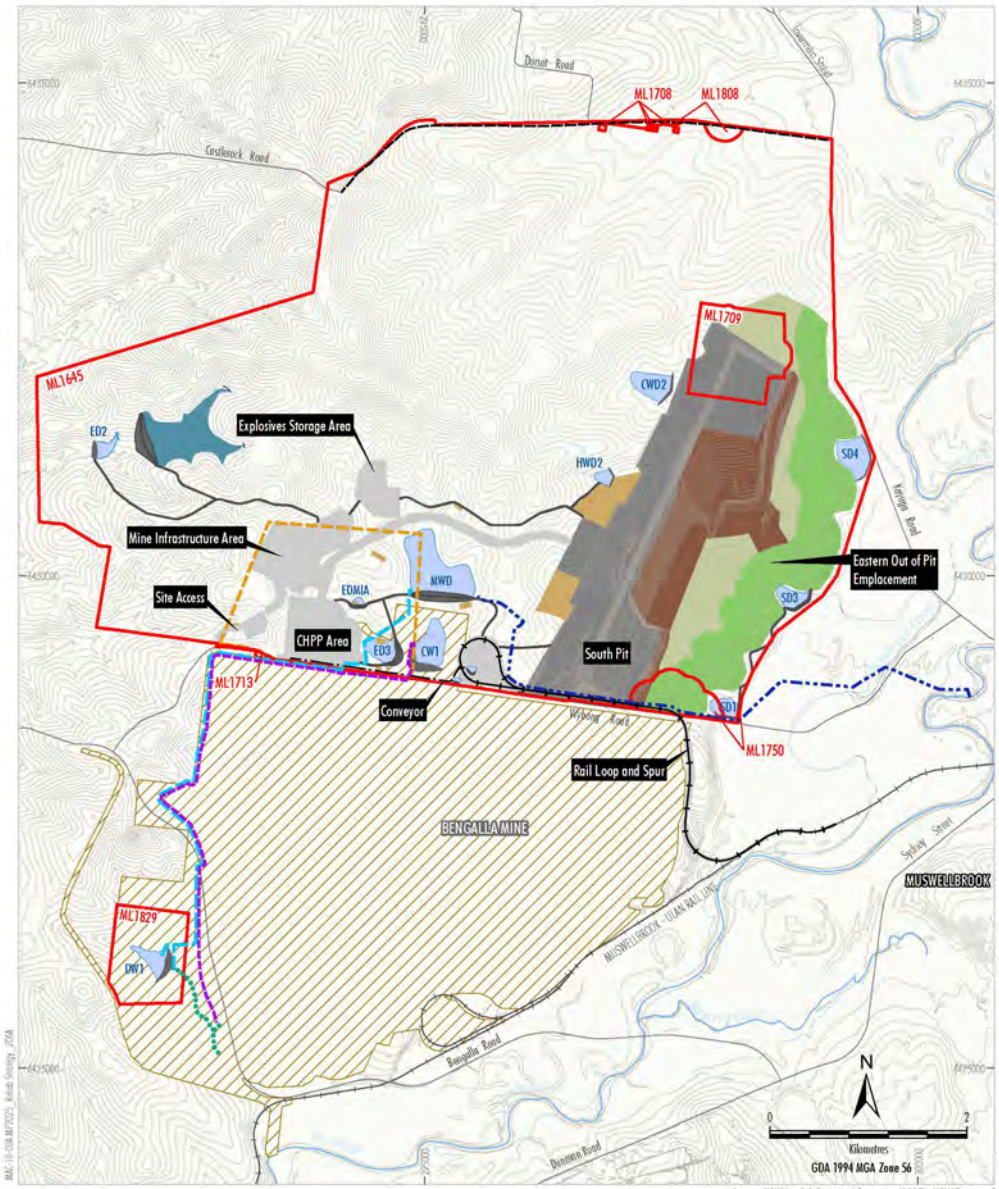
The *Strategic Framework for Mine Closure* (Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia [ANZMEC & MCA], 2000) has evolved as a cooperative development between the Australian and New Zealand Minerals and Energy Council (ANZMEC) and the Australian Minerals Industry represented by the Minerals Council of Australia (MCA) that provides a framework of issues to be considered as part of a mine closure plan. The approach to mine closure as outlined in this document has been developed in consideration of the six key objectives as identified by this framework document. Each of these objectives is outlined in Table 4, along with the relevant section of this document where they are addressed.

Table 4
Key Objectives from the Strategic Framework for Mine Closure

Key Objectives	Key Principles	Relevant Sections of Rehabilitation Strategy/Comment
Stakeholder Involvement To enable all stakeholders to have their interests considered during the mine closure process.	1. Identification of stakeholders and interested parties is an important part of the closure process.	Section 4.7
	2. Effective consultation is an inclusive process which encompasses all parties and should occur throughout the life of the mine.	
	3. A targeted communication strategy should reflect the needs of the stakeholder groups and interested parties.	
	4. Adequate resources should be allocated to ensure the effectiveness of the consultation process.	
	5. Wherever practical, work with communities to manage the potential impacts of mine closure.	
Planning To ensure the process of mine closure occurs in an orderly, cost-effective and timely manner.	1. Mine closure should be integral to the whole of mine life plan.	This document and Section 4.7.
	2. A risk-based approach to planning should reduce both cost and uncertainty.	Rehabilitation Cost Estimate (separate document available on the MACH Energy website).
	3. Closure plans should be developed to reflect the status of the project or operation.	Section 4.7.2
	4. Closure planning is required to ensure that closure is technically, economically and socially feasible.	
	5. The dynamic nature of closure planning requires regular and critical review to reflect changing circumstances.	
Financial Provision To ensure the cost of closure is adequately represented in company accounts and that the community is not left with a liability.	1. A cost estimate for closure should be developed from the closure plan.	Rehabilitation Cost Estimate (separate document available on the MACH Energy website).
	2. Closure cost estimates should be reviewed regularly to reflect changing circumstances.	
	3. The financial provision for closure should reflect the real cost.	
	4. Accepted accounting standards should be the basis for the financial provision.	
	5. Adequate securities should protect the community from closure liabilities.	

Table 4 (Continued)
Key Objectives from the Strategic Framework for Mine Closure

Key Objectives	Key Principles	Relevant Sections of Rehabilitation Strategy/Comment
Implementation To ensure there is clear accountability, and adequate resources, for the implementation of the closure plan.	1. The accountability for resourcing and implementing the closure plan should be clearly identified. 2. Adequate resources must be provided to assure conformance with the closure plan. 3. The on-going management and monitoring requirements after closure should be assessed and adequately provided for. 4. A closure business plan provides the basis for implementing the closure plan. 5. The implementation of the closure plan should reflect the status of the operation.	Sections 4.7 and 9.2.1 Rehabilitation Cost Estimate (separate document available on the MACH Energy website).
Standards To establish a set of indicators which will demonstrate the successful completion of the closure process.	1. Legislation should provide a broad regulatory framework for the closure process. 2. It is in the interest of all stakeholders to develop standards that are both acceptable and achievable. 3. Completion criteria are specific to the mine being closed, and should reflect its unique set of environmental, social and economic circumstances. 4. An agreed set of indicators should be developed to demonstrate successful rehabilitation of a site. 5. Targeted research will assist both government and industry in making better and more informed decisions.	MPO RMP (separate document available on the MACH Energy website).
Relinquishment To reach a point where the company has met agreed completion criteria to the satisfaction of the Responsible Authority.	1. A Responsible Authority should be identified and held accountable to make the final decision on accepting closure. 2. Once the completion criteria have been met, the company may relinquish their interest. 3. Records of the history of a closed site should be preserved to facilitate future land use planning.	MPO RMP (separate document available on the MACH Energy website).



Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2018)

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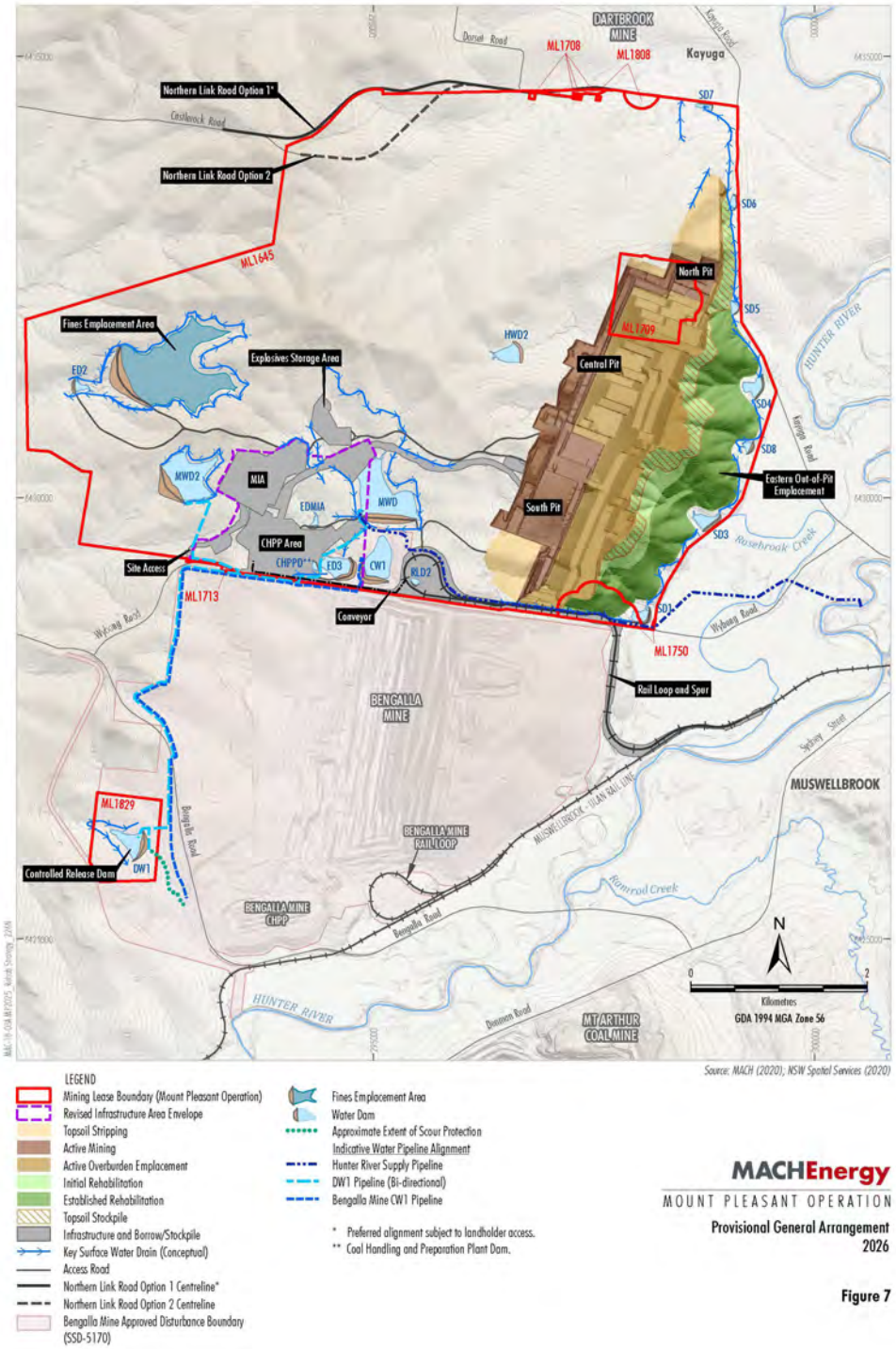
Conceptual Project Layout Plan at 2025 (Development Consent DA 92/97)

Figure 6



Source: MACH (2020); NSW Spatial Services (2020)

LEGEND

- Mining Lease Boundary (Mount Pleasant Operation)
- Revised Infrastructure Area Envelope
- Topsoil Stripping
- Active Mining
- Active Overburden Emplacement
- Initial Rehabilitation
- Established Rehabilitation
- Topsoil Stockpile
- Infrastructure and Borrow/Stockpile
- Key Surface Water Drain (Conceptual)
- Access Road
- Northern Link Road Option 1 Centreline*
- Northern Link Road Option 2 Centreline
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)
- Fines Emplacement Area
- Water Dam
- Approximate Extent of Scour Protection
- Indicative Water Pipeline Alignment
- Hunter River Supply Pipeline
- DW1 Pipeline (Bi-directional)
- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.
** Coal Handling and Preparation Plant Dam.

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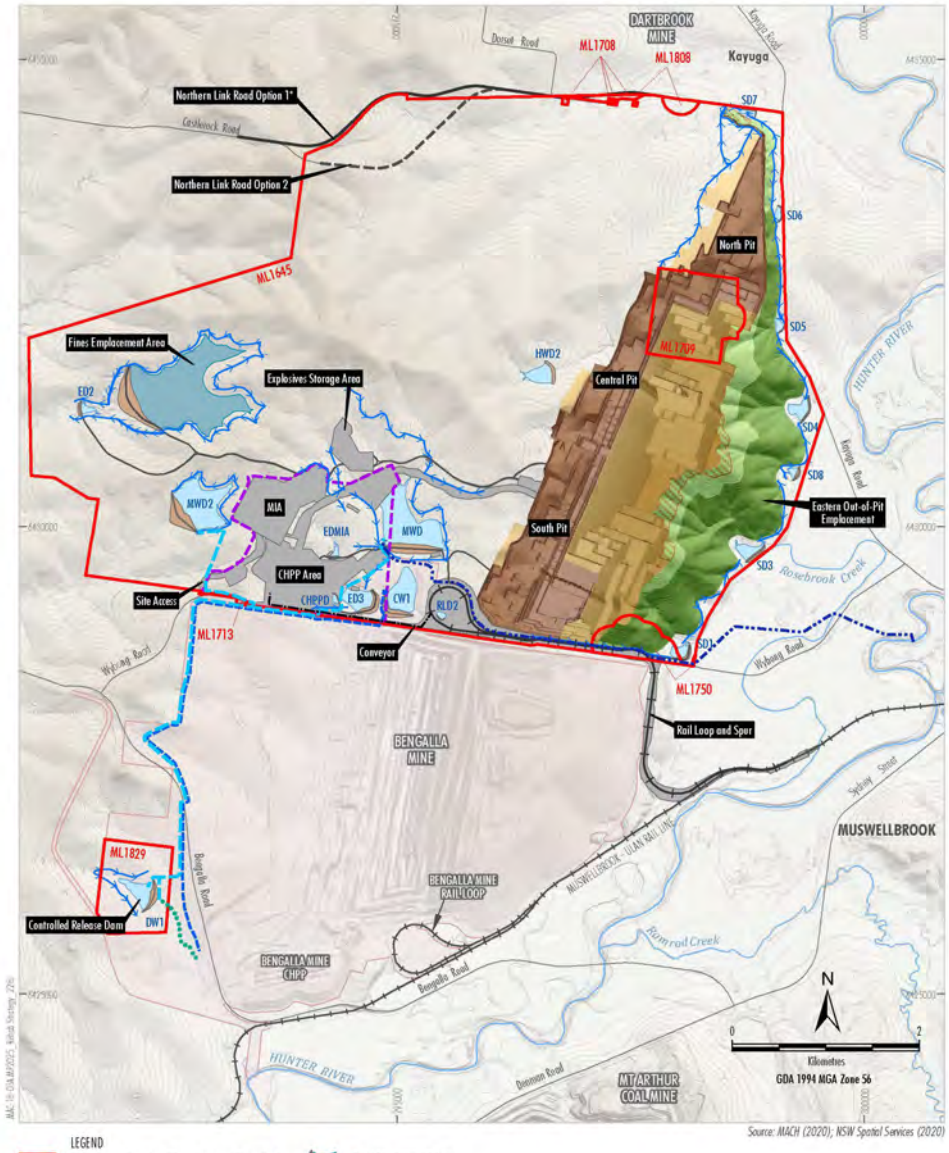
Provisional General Arrangement 2026

Figure 7


DARTBROOK MINE
ML1708
ML1808
Kayuga
Dorset Road
Northern Link Road Option 1*
Northern Link Road Option 2
Cashmere Road
ML1645
SD7
SD6
North Pit
SD5
ML1709
Central Pit
HWD2
Fines Emplacement Area
ED2
Explosives Storage Area
HUNTER RIVER
SD4
SD8
Kayuga Road
Eastern Out-of-Pit Emplacement
MWD2
MIA
EDMIA
MWD
South Pit
CHPP Area
CHPPD
ED3
CW1
RLD2
SD3
Rosebrook Creek
Site Access
ML1713
Conveyor
SD1
Wybong Road
ML1750
Rail Loop and Spur
BENGALLA MINE
MUSWELLBROOK
Sydney Street
ML1829
Controlled Release Dam
DW1
Bengalla Road
BENGALLA MINE RAIL LOOP
MUSWELLBROOK - ULAN RAIL LINE
Rombrail Creek
BENGALLA MINE CHPP
Bengalla Road
HUNTER RIVER
Denman Road
MT ARTHUR COAL MINE
N
0
2
Kilometres
GDA 1994 MGA Zone 56
Source: MACH (2020); NSW Spatial Services (2020)
LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Revised Infrastructure Area Envelope
Topsoil Stripping
Active Mining
Active Overburden Emplacement
Initial Rehabilitation
Established Rehabilitation
Topsoil Stockpile
Infrastructure and Borrow/Stockpile
Key Surface Water Drain (Conceptual)
Access Road
Northern Link Road Option 1 Centreline*
Northern Link Road Option 2 Centreline
Bengalla Mine Approved Disturbance Boundary (SSD-5170)
Fines Emplacement Area
Water Dam
Approximate Extent of Scour Protection
Indicative Water Pipeline Alignment
Hunter River Supply Pipeline
DW1 Pipeline (Bi-directional)
Bengalla Mine CW1 Pipeline
* Preferred alignment subject to landholder access.
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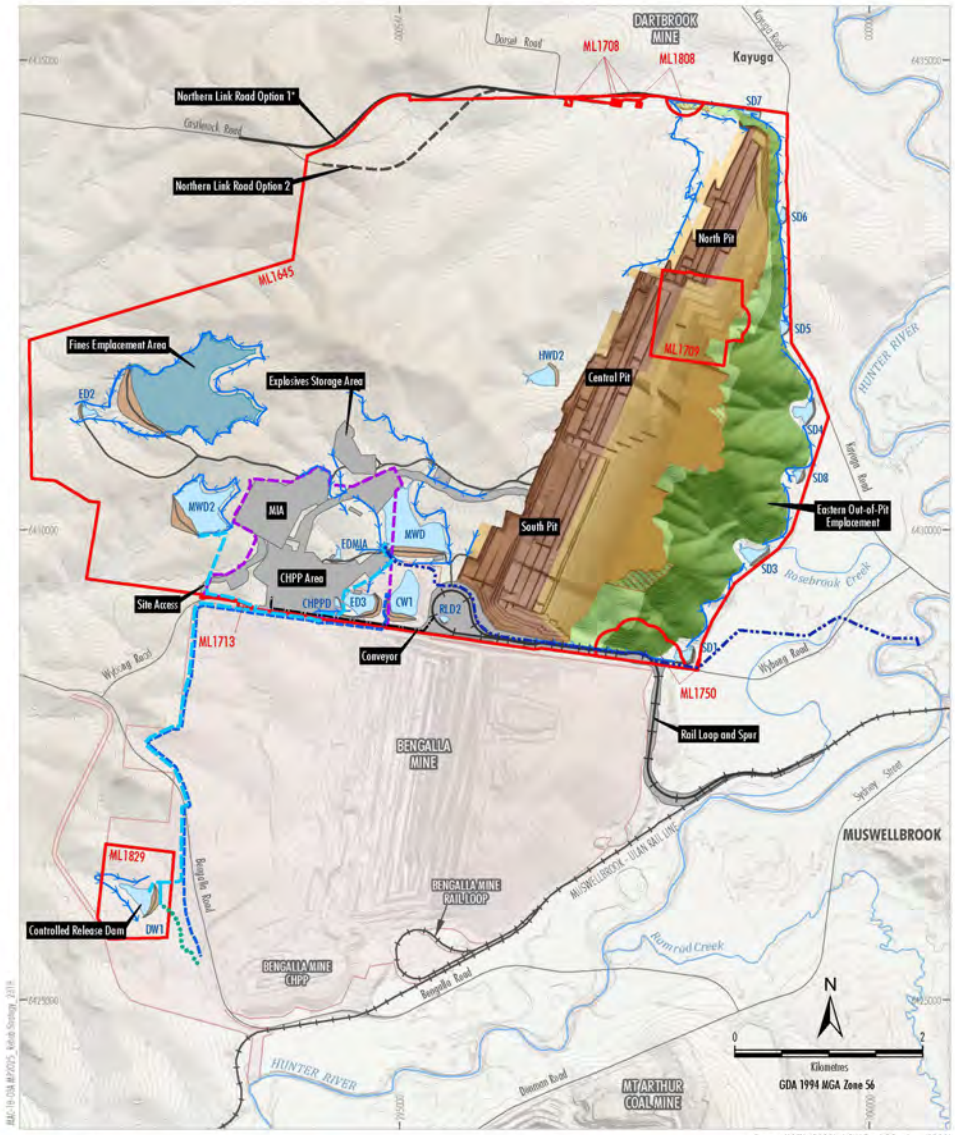
MOUNT PLEASANT OPERATION
Provisional General Arrangement 2028

Figure 8


DARTBROOK MINE
ML1708
ML1808
Kayuga
Northern Link Road Option 1*
Northern Link Road Option 2
ML1645
SD7
SD6
North Pit
SD5
ML1709
HUNTER RIVER
Fines Emplacement Area
ED2
Explosives Storage Area
HWD2
Central Pit
SD4
SD8
Eastern Out-of-Pit Emplacement
MWD2
MIA
EDMIA
MWD
South Pit
CHPP Area
CHPPD
ED3
CW1
RLD2
SD3
Rosebrook Creek
Site Access
ML1713
Conveyor
ED1
Wybong Road
ML1750
Rail Loop and Spur
BENGALLA MINE
MUSWELLBROOK
ML1829
Controlled Release Dam
DW1
Bengalla Road
BENGALLA MINE RAIL LOOP
MUSWELLBROOK - ULAN RAIL LINE
Ramrod Creek
BENGALLA MINE CHPP
HUNTER RIVER
Dimmocks Road
MT ARTHUR COAL MINE
N
0
2
Kilometres
GDA 1994 MGA Zone 56
Source: MACH (2020); NSW Spatial Services (2020)
LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Revised Infrastructure Area Envelope
Topsoil Stripping
Active Mining
Active Overburden Emplacement
Initial Rehabilitation
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Infrastructure and Borrow/Stockpile
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Access Road
Northern Link Road Option 1 Centreline*
Northern Link Road Option 2 Centreline
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Fines Emplacement Area
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Approximate Extent of Scour Protection
Indicative Water Pipeline Alignment
Hunter River Supply Pipeline
DW1 Pipeline (Bi-directional)
Bengalla Mine CW1 Pipeline
* Preferred alignment subject to landholder access.
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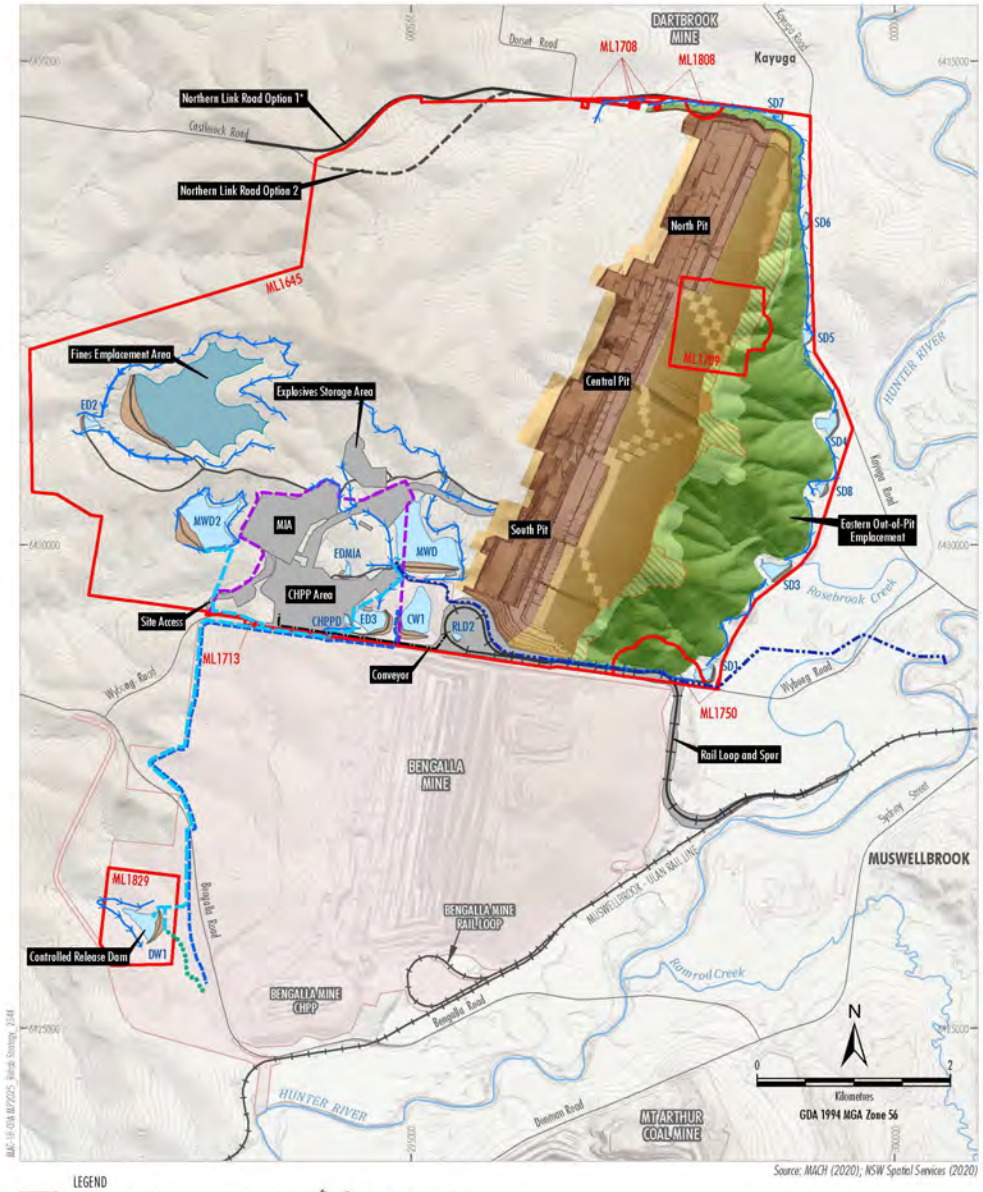
MOUNT PLEASANT OPERATION
Provisional General Arrangement
2031

Figure 9



Source: MACH (2020); NSW Spatial Services (2020)

LEGEND

- Mining Lease Boundary (Mount Pleasant Operation)
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- Water Dam
- Approximate Extent of Scour Protection
- Indicative Water Pipeline Alignment
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- DW1 Pipeline (Bi-directional)
- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.

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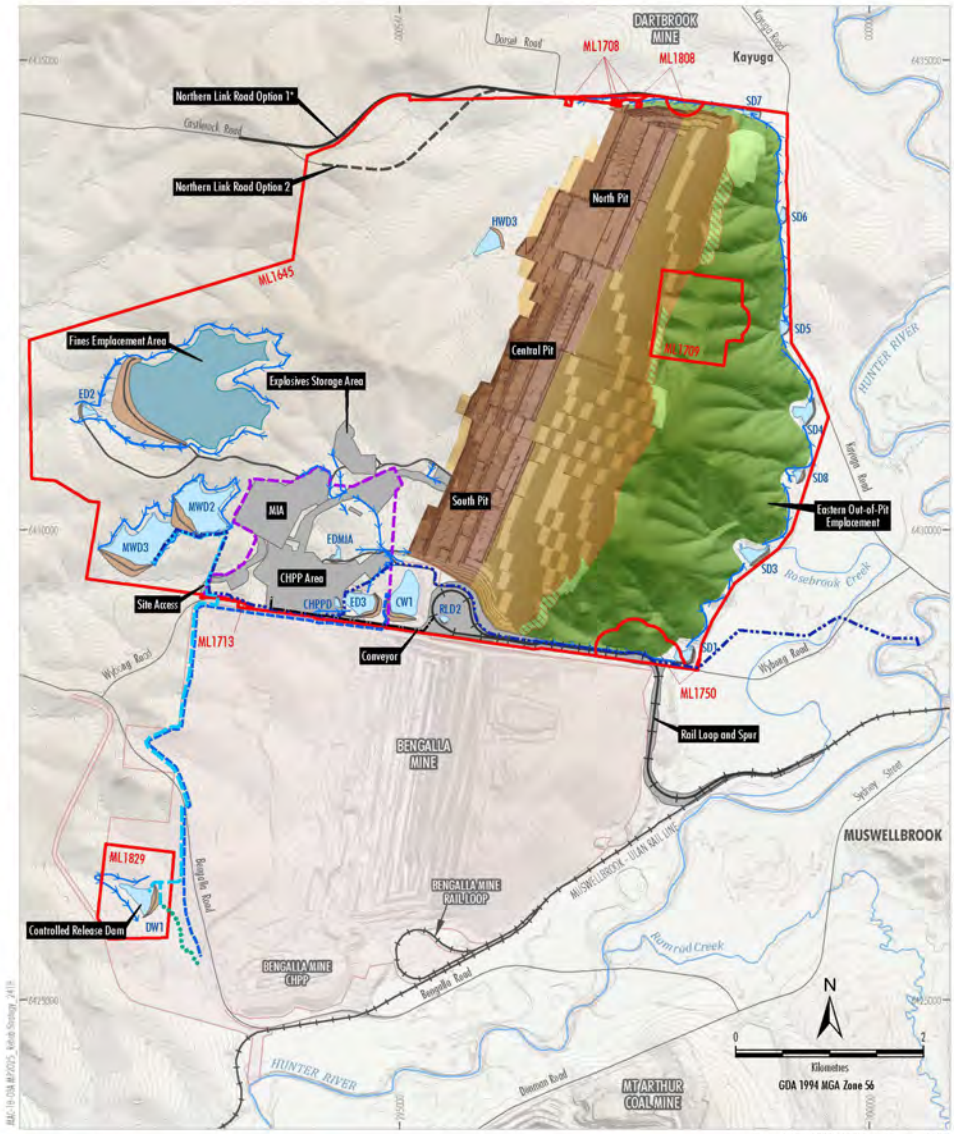
MOUNT PLEASANT OPERATION

Provisional General Arrangement 2034

Figure 10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ML1708
ML1808
Kayuga
Northern Link Road Option 1*
Northern Link Road Option 2
North Pit
HWD3
SD7
SD6
SD5
SD4
SD8
ML1645
Fines Emplacement Area
Explosives Storage Area
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ED2
MWD2
MWD3
MIA
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CHPP Area
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BENGALLA MINE CHPP
Bengalla Road
Bettys Creek
HUNTER RIVER
Denman Road
MT ARTHUR COAL MINE
N
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Kilometres
GDA 1994 MGA Zone 56
Source: MACH (2020); NSW Spatial Services (2020)
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DW1 Pipeline (Bi-directional)
Bengalla Mine CW1 Pipeline
* Preferred alignment subject to landholder access.
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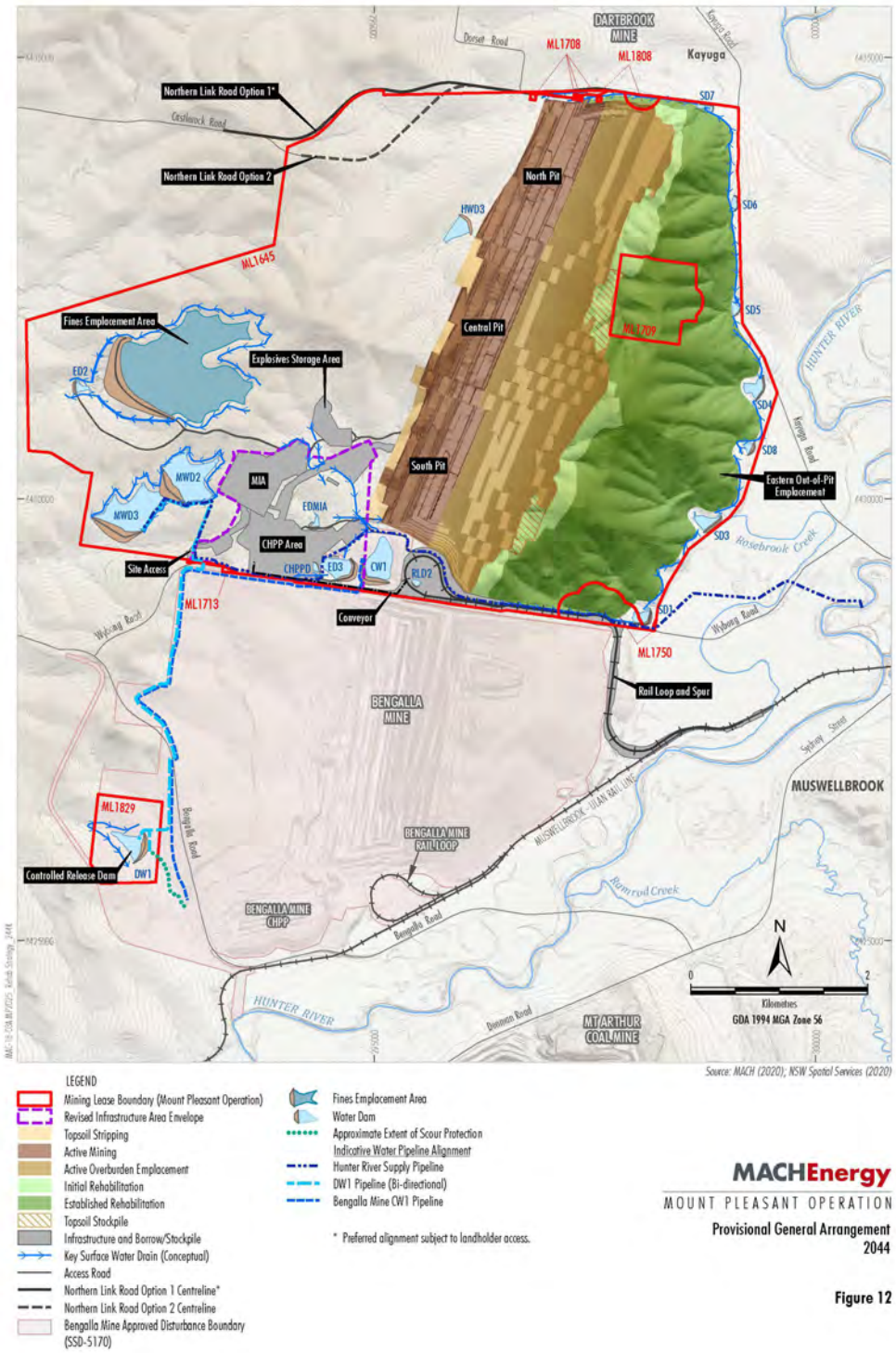
MOUNT PLEASANT OPERATION
Provisional General Arrangement 2041

Figure 11


DARTBROOK MINE
ML1708
ML1808
Kayuga
Dorset Road
Northern Link Road Option 1*
Northern Link Road Option 2
Castlerock Road
SD7
North Pit
HWD3
SD6
ML1645
Fines Emplacement Area
Explosives Storage Area
ED2
Central Pit
ML1709
SD5
HUNTER RIVER
SD4
Kayuga Road
SD8
South Pit
MWD2
MIA
MWD3
EDMIA
Eastern Out-of-Pit Emplacement
SD3
Rosebrook Creek
CHPP Area
CHPPD
ED3
CW1
RLD2
Site Access
ML1713
Conveyor
SD1
Wybong Road
ML1750
Rail Loop and Spur
BENGALLA MINE
Sydney Street
MUSWELLBROOK
ML1829
Bengalla Road
MUSWELLBROOK - ULAN RAIL LINE
BENGALLA MINE RAIL LOOP
Controlled Release Dam
DW1
Bornyrod Creek
BENGALLA MINE CHPP
Bengalla Road
N
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Kilometres
GDA 1994 MGA Zone 56
HUNTER RIVER
Denman Road
MT ARTHUR COAL MINE
Source: MACH (2020); NSW Spatial Services (2020)
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Mining Lease Boundary (Mount Pleasant Operation)
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Indicative Water Pipeline Alignment
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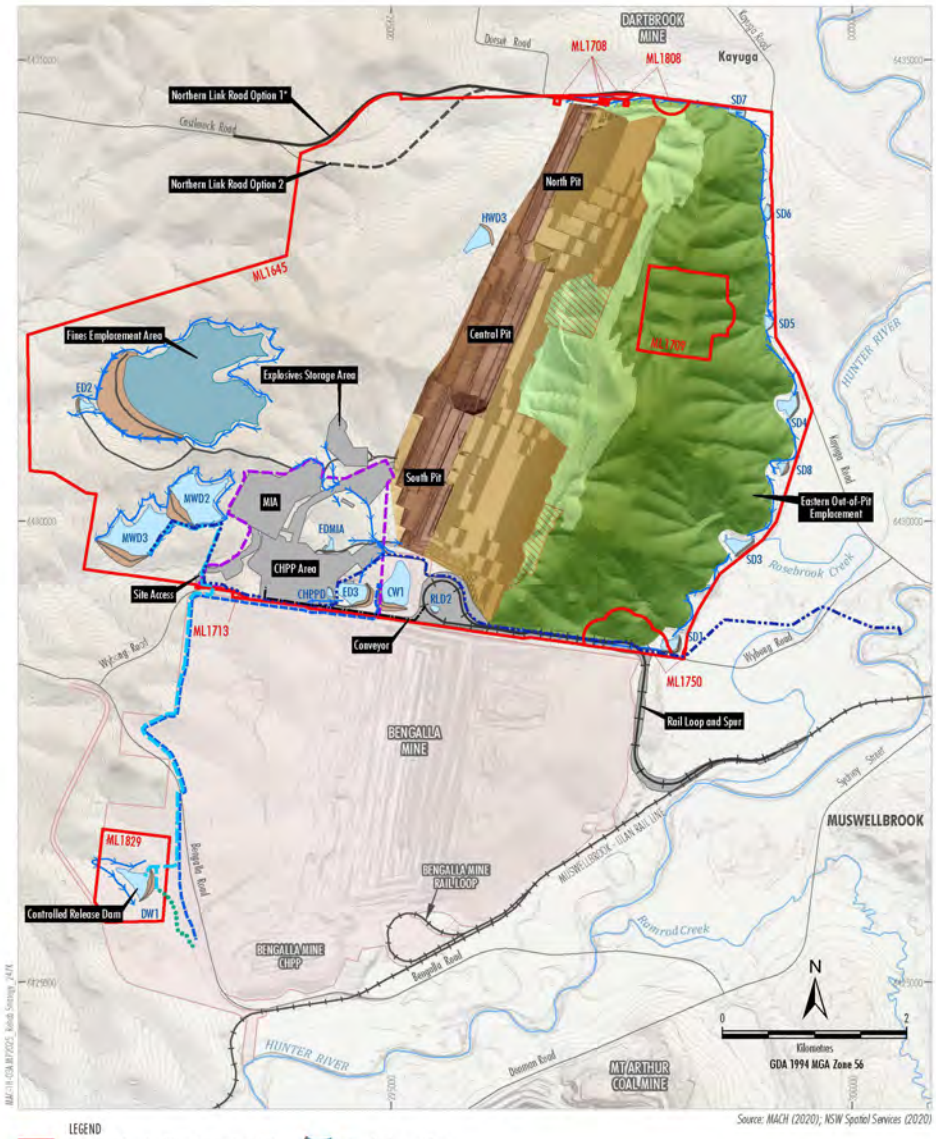
DW1 Pipeline (Bi-directional)
Bengalla Mine CW1 Pipeline
* Preferred alignment subject to landholder access.
MACHEnergy
MOUNT PLEASANT OPERATION
Provisional General Arrangement 2044

Figure 12



Source: MACH (2020); NSW Spatial Services (2020)

LEGEND

- Mining Lease Boundary (Mount Pleasant Operation)
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- Indicative Water Pipeline Alignment
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- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.

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MOUNT PLEASANT OPERATION

Provisional General Arrangement 2047

Figure 13

4.2 GENERAL REHABILITATION PRINCIPLES

This section describes the post-mining land use and rehabilitation domains, and general principles that will be applied to all rehabilitated landforms at the MPO.

The general principles are based on the principles provided in the *National Standards for the Practice of Ecological Restoration in Australia, 2nd Edition* (Society for Ecological Restoration Australasia [SERA], 2018) as follows:

1. *Ecological restoration practice is based on an appropriate local indigenous reference ecosystem.*
2. *Restoration inputs will be dictated by level of resilience and degradation.*
3. *Recovery of ecosystem attributes is facilitated by identifying clear targets, goals and objectives.*
4. *The goal of ecological restoration is full recovery, insofar as possible, even if outcomes take long timeframes or involve high inputs.*
5. *Restoration science and practice are synergistic.*
6. *Social aspects are critical to successful ecological restoration.*

4.2.1 Post-Mining Land Use and Rehabilitation Domains

Development Consent SSD 10418

As mining and final landform development progresses, it is appropriate to adopt the Post-Mining Land Use Domains outlined in Development Consent SSD 10418.

The rehabilitation and design objectives are consistent across both the conceptual final landform under Development Consent DA 92/97 (Figure 14) and Development Consent SSD 10418 (Figure 15) and produce a safe and stable landform with sustainable vegetation communities consistent with the surrounding area.

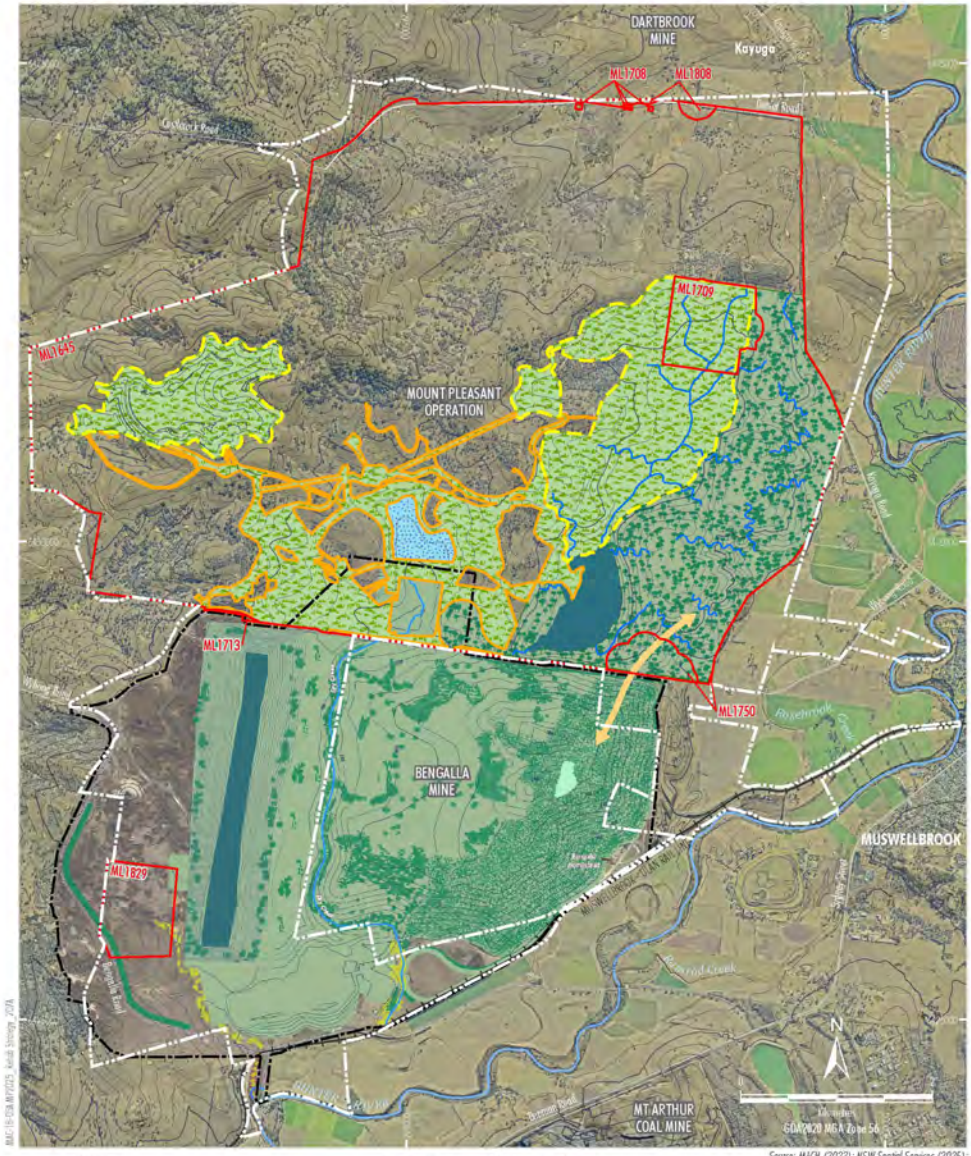
From the Project EIS (MACH Energy, 2021), the final land use goals for the Project are based on the following:

- successful design and rehabilitation of landforms to ensure structural stability, revegetation success and containment of wastes; and
- post-mining land use compatible with surrounding land uses.

The proposed final land uses for the Project have also been designed to satisfy the requirements of Commonwealth Approval EPBC 2011/5795 relevant to post-mining land use and on-site rehabilitation. Accordingly, proposed final land uses for the MPO area include permanent water infrastructure and storage areas, agricultural land, native woodland and grassland areas and the final void (Figure 15).

MACH Energy has identified parts of the Project final landform that would potentially be conducive to high-intensity agricultural use (e.g. existing mine infrastructure areas) (Figure 15). These areas will be rehabilitated to pasture using appropriate grass species. These areas are characterised by:

- Low gradient slopes and flat areas.
- Proximity to existing land used for agricultural purposes.
- Access to MPO supporting infrastructure that could potentially remain in place to support intensive agricultural use (e.g. rail loop, water storages, high capacity water pumps and pipelines, electrical infrastructure, sheds, workshops and other services).


DARTBROOK MINE
Kayuga
ML1708
ML1808
ML1709
ML1645
MOUNT PLEASANT OPERATION
ML1713
ML1750
BENGALLA MINE
MUSWELLBROOK
ML1829
MT ARTHUR COAL MINE
N
GDA2020 MGA Zone 56
LEGEND
Project Approval Boundary *
Mining Lease Boundary (Mount Pleasant Operation)
Secondary/Post-mining Land Use Domains
Domain A - Native Ecosystem
Domain B - Agricultural - Grazing
Domain G - Water Storage (Excluding Final Void)
Domain J - Final Void
Potential Low Intensity Agriculture Area
Potential High Intensity Agriculture Area
Drainage Line
Wildlife Corridor
* Appendix 1 of Development Consent DA 92/97
Bengalla Mine Conceptual Final Landform **
Project Boundary (Appendix 9 of Development Consent SSD-5170) (Dated February 2023)
** Digitised from Appendix 9 of Development Consent (SSD-5170) and amended in the Mount Pleasant Operation CHPP area.
Note: Figure excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, signalling, other ancillary works and construction disturbance.
Source: MACH (2023); NSW Spatial Services (2025); Department of Planning and Environment (2016)
Orthophoto: MACH (Jun 2023)
MACHEnergy
MOUNT PLEASANT OPERATION
Indicative Final Rehabilitation and Post-mining Land Use Domains (DA 92/97)
Figure 14

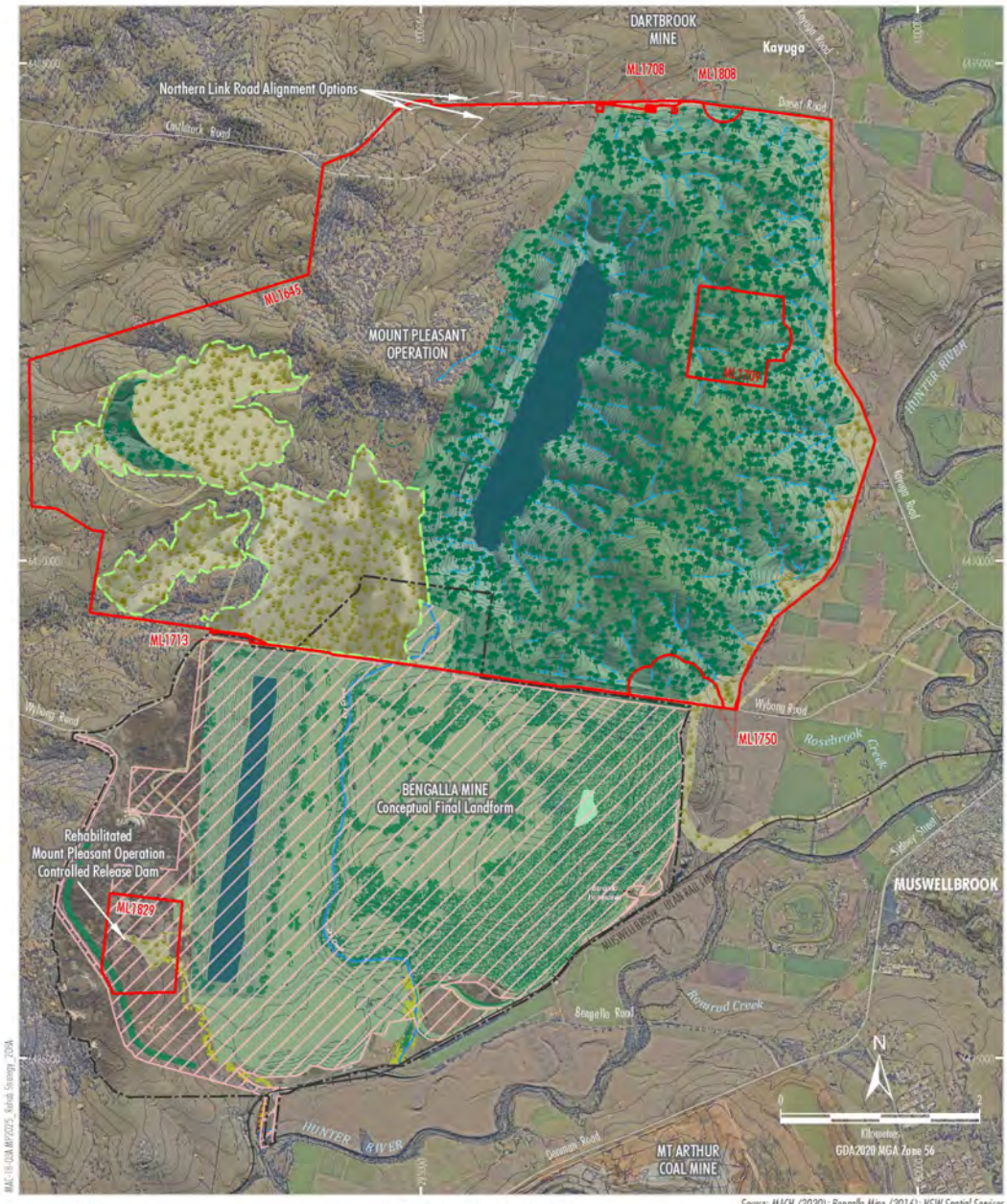

DARTBROOK MINE
Kayuga
Northern Link Road Alignment Options
Castlerock Road
Dorset Road
ML1708
ML1808
ML1645
MOUNT PLEASANT OPERATION
ML1713
ML1750
Wybong Road
Rosebrook Creek
BENGALLA MINE
Conceptual Final Landform
Rehabilitated Mount Pleasant Operation Controlled Release Dam
ML1829
MUSWELLBROOK
Bengalla Road
Ramrod Creek
HUNTER RIVER
Denman Road
MT ARTHUR COAL MINE
N
0
2
Kilometres
GDA2020 MGA Zone 56
LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Final Landform Contour (10 m interval)
Final Landform Drainage Line
Secondary/Post-mining Land Use Domains
Domain A - Native Ecosystem
Domain B - Agricultural - Grazing
Domain J - Final Void
Potential High Intensity Agriculture Area
Bengalla Mine Conceptual Final Landform *
Project Boundary (Appendix 9 of Development Consent SSD-5170) (Dated February 2023)
Bengalla Mine Approved Disturbance Boundary (SSD-5170)
* Digitised from Appendix 9 of Development Consent (SSD-5170) and amended in the Mount Pleasant Operation CHPP area.
Source: MACH (2020); Bengalla Mine (2016); NSW Spatial Services (2020); Department of Planning and Environment (2016)
Orthophoto: MACH (2020)
Note: Light vehicle access roads and upslope diversions associated with minimising the catchment of the final void and Fines Emplacement Area are not shown.
MACHEnergy
MOUNT PLEASANT OPERATION
Conceptual Final Land Use Areas (SSD 10418)

Figure 15

MACH Energy will decommission and remove all Project infrastructure unless a suitable post-mining use is identified for the infrastructure in consultation with the NSW Resources Regulator and MSC. The Mine Closure Plan will include detail on the process that will be implemented for any retained infrastructure, including risk management.

In addition to beneficial biodiversity conservation outcomes, the proposed native woodland and grassland areas associated with the mine landforms could provide regional tourism opportunities associated with proximity to native wildlife (e.g. bird watching) and/or active uses of the Project final landform, including activities that could make use of the rehabilitated Eastern Out-of-Pit Emplacement (e.g. walking or mountain biking trails).

The consideration of potential alternative and feasible beneficial uses of the Project Final Void is discussed further in Section 4.5.

The Post-Mining Land Use Domains (also known as 'secondary domains') relevant to the MPO are described in Table 5. The secondary domains at the MPO have been prepared in consideration of the categories in the *Form and Way for Rehabilitation Management Plans for Large Mines* (NSW Resources Regulator, 2024a) and the classifications of domains match the spatial codes listed in the *Guidelines: Mine Rehabilitation Portal* (NSW Resources Regulator, 2021), where each of the secondary domains are characterised by a similar post-mining land use objective. The Post-Mining Land Use Domains under Development Consent SSD 10418 for 2048 are shown on Figure 15. The approved plans showing indicative mining and rehabilitation progression are included as Figures 6 to 13.

The Post-Mining Land Use Domains will be reviewed in consultation with key stakeholders (including the MSC, relevant regulatory agencies [including the DPIE (now DPHI), NSW Resources Regulator, and the NSW Department of Primary Industries [DPI] Agriculture], and the MPO's Community Consultative Committee [CCC]) during the life of the MPO as part of the MPO RMP and Rehabilitation Strategy revision process (Section 7).

In accordance with Part B, Condition B89(n) of Development Consent SSD 10418, MACH Energy will periodically review and update the Rehabilitation Strategy at least every three years (Section 7).

As rehabilitation progresses, an independent Land Capability Assessment will be undertaken using the *Land and soil capability assessment scheme: second approximation - a general rural land evaluation system for New South Wales* (NSW Office of Environment and Heritage [OEH], 2012) to identify specific locations suitable for low intensity agricultural activities.

Table 5
Post-Mining Land Use Domains and Spatial Codes

Final Land Use Domain			Mining Domain	
Code	**Secondary Domain**	**Rehabilitation Objectives**	**Code**	**Mining Domain**
J	Final Void	• Final void is safe, stable and non-polluting. Final void design to ensure the final void does not spill. • Final void land use to be developed in consultation with relevant stakeholders. • Final void shaped to be consistent with the surrounding natural environment and to avoid an engineered profile. • Final void designed as long-term groundwater sink to maximise groundwater flows across back filled pits to the final void. • Minimise to the greatest extent practicable: – the size and depth of final voids; – the drainage catchment of final voids; – any high wall instability risk; and • the risk of flood interaction.	1	Infrastructure Area
			2	Tailings Storage Facility
			3	Water Management Area
B	Agricultural – Grazing	• Infrastructure will be decommissioned and removed (unless the NSW Resources Regulator agrees otherwise). • Landform is functional and indicative of a landscape on a self-sustaining trajectory. • Establish/restore grassland areas to support sustainable agricultural activities. • Achieve the nominated land capability classification.	4	Overburden Emplacement Area
A	Native Ecosystem	• Establish native vegetation comparable to suitable reference/analogue sites. • Landform is functional and indicative of a landscape on a self-sustaining trajectory. • Habitat features are salvaged and re-used in rehabilitation areas to provide fauna habitat resources. • Restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area. • Establish areas of self-sustaining: – riparian habitat, within any diverted and/or re-established creek lines and retained water features; and – potential habitat for threatened flora and fauna species.	5	Active Mining Area (Open cut void)

Source: MACH Energy, 2021; NSW Resources Regulator, 2021.

Rehabilitation objectives have been developed for the MPO's rehabilitation domains and are described in detail in the MPO RMP along with the Annual Rehabilitation Report and Forward Program (and will continued to be included in future versions of the MPO RMP).

4.2.2 Performance Indicators and Completion Criteria

The *Form and Way for Rehabilitation Objectives Statement, Rehabilitation Completion Criteria Statement and Final Landform and Rehabilitation Plan for Large Mines* (NSW Resources Regulator, 2024b) defines performance indicators and completion criteria as follows:

- A Performance Indicator is an attribute of the biophysical environment (e.g. pH, slope, topsoil depth, biomass) that can be used to approximate the progression of a biophysical process. It can be measured and audited to demonstrate (and track) the progress of an aspect of rehabilitation towards a desired completion/relinquishment criterion. The indicator may be aligned to an established protocol and used to evaluate changes in a system.
- Completion Criteria (or Relinquishment Criteria) are objective target levels or values that can be measured to quantitatively demonstrate the progress and ultimate success of a biophysical process. These are the standards that are to be met by successful rehabilitation. These criteria will generally be in the form of a numerical value that can be verified by measurement of the indicators selected for the rehabilitation objectives. They may include an element based on time.

Rehabilitation objectives, performance indicators and completion criteria for the MPO have been developed in the approved MPO RMP and associated Annual Rehabilitation Report and Forward Program. These documents will be reviewed and updated for the Project as part future MPO RMPs (https://machenergyaustralia.com.au/mount-pleasant/documentation/).

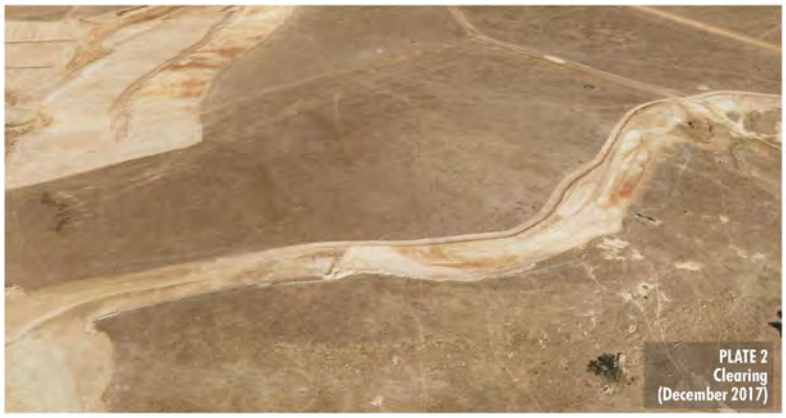
4.2.3 Rehabilitation Phases

The rehabilitation phases for the MPO are summarised below:

- Phase 1 – Decommissioning – removal of hard stand areas, buildings, contaminated materials and hazardous materials.
- Phase 2 – Landform Establishment – incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology.
- Phase 3 – Growth Media Development – incorporates physical, chemical and biological components of the growing media and ameliorants that are used to optimise the potential of the media in terms of the preferred vegetative cover.
- Phase 4 – Ecosystem and Land Use Establishment – incorporates revegetated lands and habitat augmentation; species selection, species presence and growth together with weed and pest animal control/management; and establishment of flora.
    - Areas at the Ecosystem and Land Use Establishment phase at the MPO reflect lands where habitat features have been placed, and the area has been topsoiled, deep ripped and revegetated with species relevant to the post-mining land use of the area (e.g. native woodland/grassland species or select pasture species). For MPO Overburden Emplacement areas this includes land that has been seeded with stabilising sterile cover crop species and native grass, shrub and tree species representative of the target PCTs (Section 4.3).
- Phase 5 – Ecosystem and Land Use Sustainability – incorporates rehabilitation of key ecosystem attributes including plant species composition, floristic structure, nutrient cycling, natural recruitment and connectivity characteristic of a sustainable landscape.
- Phase 6 – Relinquished Lands – land use and landscape is deemed as suitable to be relinquished from the MLs.

As described in Section 5.1, temporary rehabilitation, including hydromulching and seeding with sterile cover crops, of temporary landforms (e.g. mine access roads and construction areas etc.), will be undertaken across the site to minimise the total area exposed at any time. This temporary rehabilitation will be undertaken where areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated, in accordance with Condition 55, Schedule 3 of Development Consent DA 92/97 (prior to its surrender). Temporary rehabilitation will be undertaken within 6 months of these areas becoming available. Temporary rehabilitation is described in further detail in the MPO RMP and associated Annual Rehabilitation Report and Forward Program and will continue to be described in future versions of the MPO RMP.

Plates 1 to 9 show the progressive development of a portion of the Eastern Out-of-Pit Emplacement from December 2017 (pre-mining), July 2020 (initial vegetation growth) and December 2024 (established vegetation).

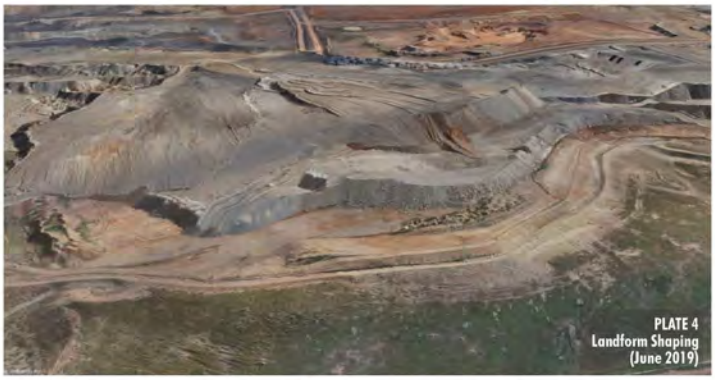


Source: MACH (2025)

LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Rehabilitation Progression Area

MACHEnergy
MOUNT PLEASANT OPERATION
Rehabilitation Progression

Plates 1 to 3

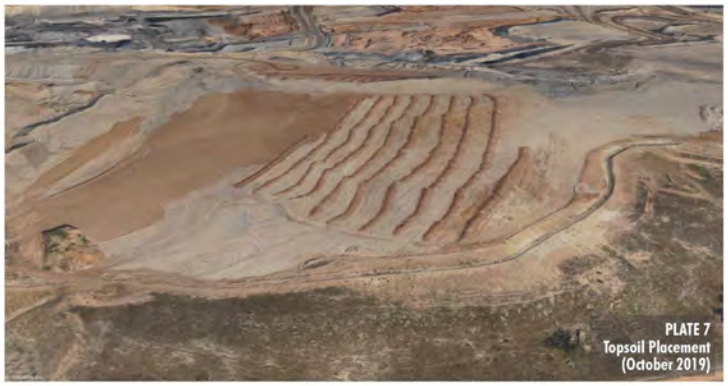


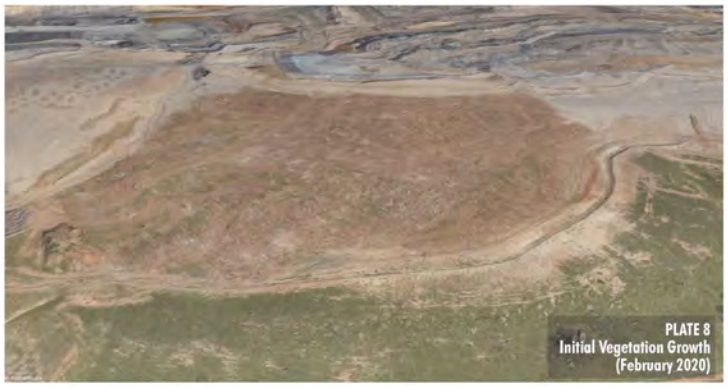
Source: MACH (2025)

LEGEND
Mining Lease Boundary
(Mount Pleasant Operation)
Rehabilitation Progression Area

MACHEnergy
MOUNT PLEASANT OPERATION
Rehabilitation Progression

Plates 4 to 6





Source: MACH (2025)

LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Rehabilitation Progression Area

MACHEnergy
MOUNT PLEASANT OPERATION
Rehabilitation Progression

Plates 7 to 9

4.2.4 Final Landform

MACH Energy is aware of the level of local interest with respect to the shape and form of MPO final mine landforms. Accordingly, MACH Energy has undertaken a comprehensive approach to landform design based on the following key design principles:

- The emplacement landform has been designed to look less “engineered” when viewed from Muswellbrook (i.e. incorporation of macro-relief to avoid simple blocky forms).
- Surface water drainage from the waste emplacement landform will incorporate micro-relief to increase drainage stability, avoid major engineered drop structures and limit erosion.
- The final void (and associated drainage network) will be shaped to reflect a less engineered profile that is more consistent with the surrounding natural environment.
- The final void has been designed as a long-term groundwater sink to maximise groundwater flows from the Eastern Out-of-Pit Emplacement to the final void.
- MACH Energy will continue to progressively develop and revegetate the final landform to reduce visual impacts in Muswellbrook and continue to monitor the performance of rehabilitation and implement remediation as required (Section 4.8).

The conceptual final landform under Development Consent DA 92/97 for 2026 is shown on Figure 16. The conceptual final landform under Development Consent SSD 10418 for 2048 is shown on Figure 17. The approved plans showing indicative mining and rehabilitation progression in accordance with Development Consent SSD 10418 are included as Figures 6 to 13.

As mining and final landform development progresses, MACH Energy will develop the landform generally in accordance with Development Consent SSD 10418.

The approved final landform under Development Consent SSD 10418 has been developed using geomorphic design principles to address these key design principles. The landform has been designed using the GeoFluv™ methodology, which uses characteristics of relevant stable natural landforms in the local environment (referred to as analogues) and applies these characteristics to the design of new landforms of similar materials. More detailed erosional based assessment and design methods are then used to refine parts of the landform that are steeper than alluvial analogues (MACH Energy, 2021).

The conceptual final landform has been developed using geomorphic design to address the key design principles summarised above. The resulting final landform largely limits slopes to less than 33% (18 degrees). There are some areas where the slopes are up to 33%, but this only represents a small proportion of the total surface area of the final landform, as shown in Attachment 5 (MACH Energy, 2021).

The geomorphic design approach reduces the reliance on contour banks and linear engineered drop structures.

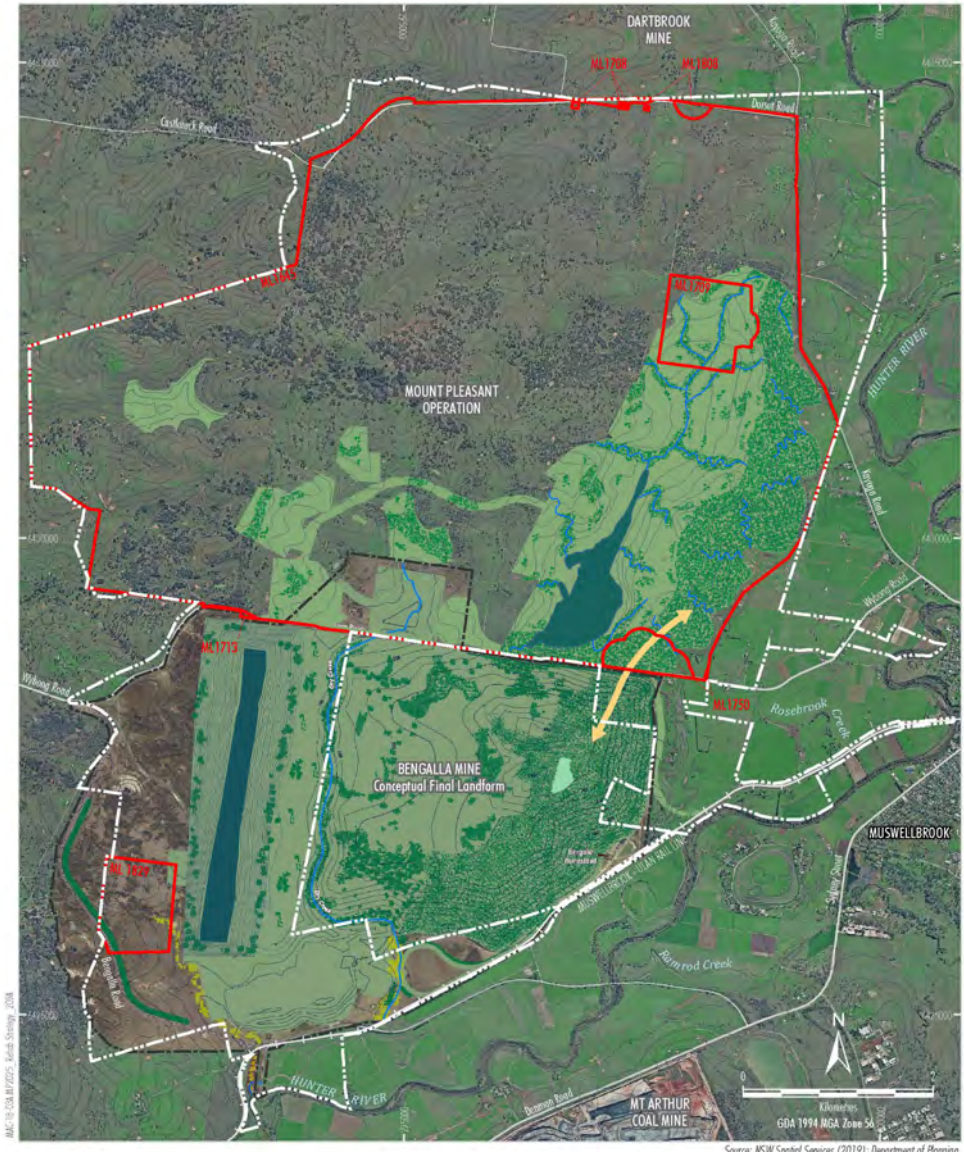
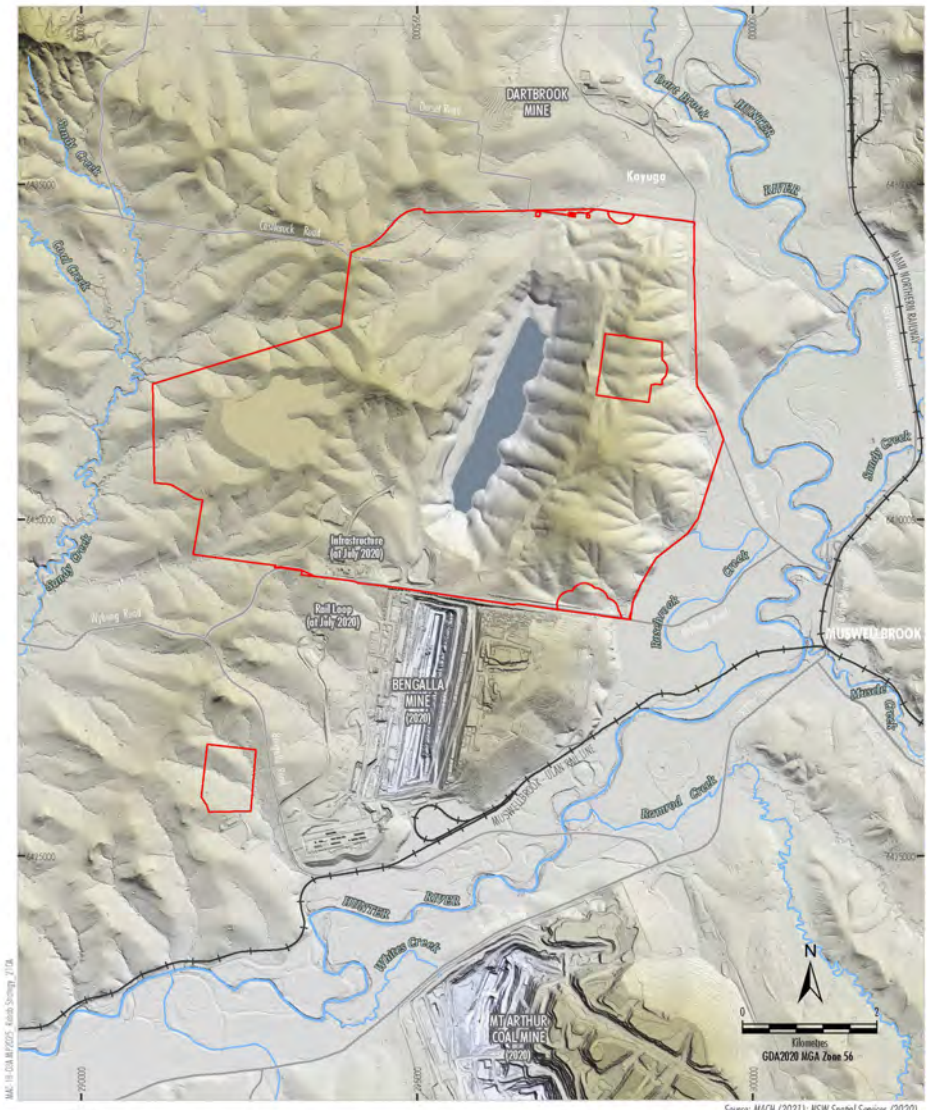

DARTBROOK MINE
MT1708
MT1709
Dorset Road
Castlerock Road
ML1562
ML1709
HUNTER RIVER
MOUNT PLEASANT OPERATION
Wybong Road
ML1713
ML1750
Rosebrook Creek
BENGALLA MINE
Conceptual Final Landform
MUSWELLBROOK
ML1707
Bengalla Road
Rumrod Creek
HUNTER RIVER
Denman Road
MT ARTHUR COAL MINE
N
0
2
Kilometres
GDA 1994 MGA Zone 56
LEGEND
Project Approval Boundary *
Mining Lease Boundary (Mount Pleasant Operation)
Final Void
Final Rehabilitation
Drainage Line
WildlifeCorridor
* Appendix 1 of Development Consent DA 92/97
Note: Figure excludes some project components such as water management infrastructure, infrastructure within the Infrastructure Area Envelope, offsite coal transport infrastructure, road diversions, access tracks, topsoil stockpiles, power supply, temporary offices, signalling, other ancillary works and construction disturbance.
Bengalla Mine Conceptual Final Landform **
Project Boundary (Appendix 9 of Development Consent SSD-5170) (Dated February 2023)
** Digitised from Appendix 9 of Development Consent (SSD-5170) and amended in the Mount Pleasant Operation CHPP area.
Source: NSW Spatial Services (2019); Department of Planning and Environment (2016); MACH (2021, 2023)
Orthophoto: MACH (Aug 2016)
MACHEnergy
MOUNT PLEASANT OPERATION
Conceptual Final Landform
- Figure 4 of Appendix 2 of DA 92/97

Figure 16



MACHEnergy

MOUNT PLEASANT OPERATION

Conceptual Project Final Landform (SSD 10418)

Figure 17

Additionally, the final void will act as a groundwater sink, drawing groundwater from the in-situ strata, Eastern Out-of-Pit Emplacement and Fines Emplacement Area towards the final void. As a result, seepage from the Fines Emplacement Area and Eastern Out-of-Pit Emplacement is predicted to primarily report to the Project and Bengalla Mine final voids.

Rehabilitation activities will continue to focus on construction of the lower batters of the Eastern Out-of-Pit Emplacement to the final landform profile and the rapid spreading of topsoil to target early revegetation of these batters, to progressively minimise visual impacts in Muswellbrook and other locations to the east (Section 4.8).

Plates 1 to 9 illustrate how MACH Energy has applied and will continue to apply this progressive geomorphic landform construction and rehabilitation methodology at the MPO.

Design Integration of Macro and Micro Relief

The emplacement extension and other proposed changes to the final landform that were approved as part of MOD 3 were intended to improve the overall appearance of the MPO landform by incorporating the following concepts:

- The final landform surface of the upper lifts on the eastern side of the emplacement will be varied to break up the horizon line when viewed from the east.
- The toe of the emplacement will be extended in plan to form a more complex shape that better aligns with the underlying and adjoining topography.

These elements of macro-relief on the eastern face of the final landform create a number of spurs and valleys, with the high points on the landform aligning with the spurs to further improve the more natural appearance of the landform from viewpoints to the north-east and south-east. The objective of the final landform is to develop drainage features in the post-mine landform that mitigate erosion potential. This will be achieved by incorporating micro-relief into the drainage design.

The NSW Mineral Council's *Rehabilitation by Design Practice Notes* (2007) and Department of Environment & Climate Change's *Managing Urban Stormwater Soils and Construction Volume 2E Mines and Quarries* (2008) provide principles for the construction of stable batter slopes. These principles include:

- Use of a combination of convex and concave outer batters to convey runoff (i.e. as opposed to fixed slope batters).
- Appropriately spaced benches to reduce the velocity of runoff.
- Gentler slope gradients.

MACH Energy has considered these principles in developing the conceptual final landform shown on Figures 16 and 17.

In particular, MACH Energy will implement the following measures to increase the stability of the final landform:

- Establish bench drains where necessary to convey runoff from batter slopes to sub-catchment drainage lines and investigate opportunities to develop small ephemeral wetlands.
- Maximise the number of sub-catchments to reduce the catchment area of individual constructed drainage lines.
- Establish meandering drainage lines that increase the total drainage length and therefore result in gentler stream bed gradients.

- Where practical, design drainage lines to generally produce a convex and concave stream bed profile.
- Establish diverse and variable density native tree and shrub cover on the outer face of the Eastern Out-of-Pit Emplacement and in final landform drainage features to promote stability of the final landform.

The final landform drainage lines will be designed to accommodate natural erosive processes. This will be achieved through consideration of key erosional and geomorphic characteristics such as nature of bed material (e.g. particle size), presence of rock outcrops, bed features (such as cascades, pool and riffle zones) as well as bed and bank vegetation.

Geomorphic features will be incorporated into the design of the relevant final landform drainages. This will also be informed by investigation into the physical characteristics of waste rock and soil materials at the MPO for provision of appropriate rock, sub-soil and topsoil material for use on outer batters and in drainage features. To construct rock-armoured drainage features (i.e. following initial settlement of the geomorphic landform), or for erosion mitigation, some areas initially established to woodland or pasture rehabilitation may need to be re-disturbed by subsequent stages of work.

Further refinement of the conceptual final landform has been undertaken and has involved GeoFluv™ modelling and other similar catchment/drainage review and landform design software to incorporate micro-relief and drainage/erosion control to limit the need for bench drains on the outer batters of the Eastern Out of Pit Emplacement.

Throughout the life of the MPO, the conceptual final landform may be revised to reflect the outcomes of the above investigations, in consultation with MSC and relevant NSW Government agencies. Progressive updates to the final landform that are consistent with the design intent concepts outlined above will be documented in the MPO RMP.

General Design Concepts – Outer Batters of Eastern Out of Pit Emplacement

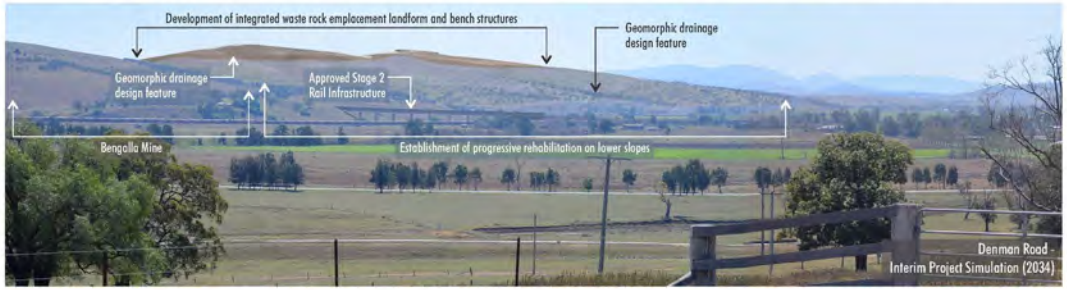
In order to develop a more natural looking landform, MACH Energy has incorporated significant areas of the outer emplacement batters at slopes of less than 10 degrees (lower slopes), and more limited areas of slopes up to approximately 14 degrees (upper slopes), to provide visually important slope variation, while also maintaining waste rock emplacement capacity.

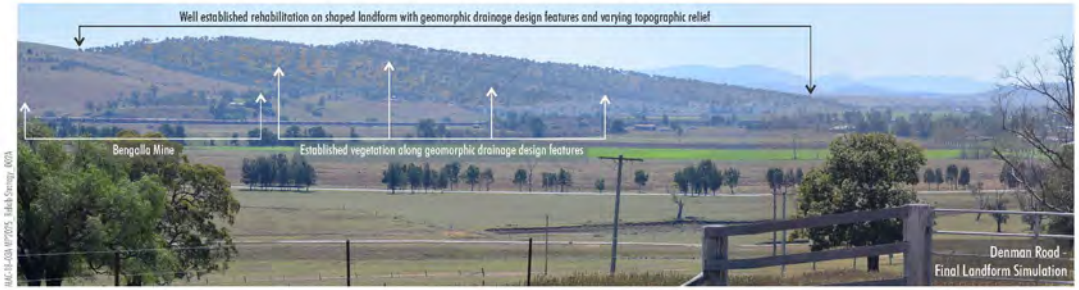
Figures 18 and 19 provide the visual simulations that illustrate how the implementation of the concepts described in this section result in a significantly improved final landform for the MPO.

In practice, significantly steeper slopes than 14 degrees in post-mining landforms can be sufficiently stable in the long term (as in the natural Hunter Valley environment), provided that they are utilised in positions in the final landform that have minimal upslope catchment (e.g. upper slopes) and are part of an integrated geomorphologically robust landform design that reflects the composition of the waste rock material.

The Project integrated waste rock emplacement has been developed using geomorphic design to provide a range of slopes consistent with natural landscape features in the region. The resulting final landform largely limits slopes to less than 33% (18°) (MACH Energy, 2021).

MACH Energy will continue to refine the design of the proposed final landform, and where relevant, will justify areas to be constructed at steep grades (including slopes greater than 14 degrees) on the basis of maintaining waste emplacement capacity and how this is acceptable due to its hydrological/drainage position and/or gynomorphically robust design in the final landform, in the MPO RMP. The final landform design would continue to be tested and iteratively designed as additional data is collected on rehabilitation and landform monitoring over the life of the Project.





Note:
Directly south of this viewpoint (behind viewer) is the Mt Arthur Coal Mine with existing views of the visual bund and mining operations.

Source: VPA (2020)

MACHEnergy

MOUNT PLEASANT OPERATION
Final Landform Simulation (SSD 10418)
Denman Road

Figure 18

Source: VPA (2020)

MACHEnergy

MOUNT PLEASANT OPERATION

Final Landform Simulation (SSD 10418)
New England Highway

Figure 19

4.2.5 Rehabilitation Materials

MACH Energy will undertake measures to retain as much material as practicable from the pre-mining landform and surrounds to be used during rehabilitation. Such measures include:

- Implementing a Vegetation Clearance Protocol which will identify and retain material for rehabilitation including habitat material (e.g. tree hollows, stag trees, coarse woody debris and rocks) and seeding vegetation for seed collection prior to clearing.
- Seed collection and propagation using the on-site Seed Harvesting Facility.
- Rehabilitation material characterisation in order to:
    - identify any physical or chemical deficiencies or limiting factors;
    - develop selective placement strategies or develop soil amelioration techniques;
    - identify material for use in the root zone, which is capable of supporting sustainable vegetation establishment, growth and natural replacement;
    - identify materials that limit plant growth or which may contaminate surface or groundwater (e.g. salinity), and hence may require special handling, treatment or disposal; and
    - identify any Potential Acid Forming Material (PAF) this includes material with adverse chemical characteristics, including all carbonaceous containing material with a propensity for spontaneous combustion.. The management of PAF is undertaken in accordance with the site operator's Mount Pleasant Acid Mine Drainage Management Plan. Restricted material is placed 10m below final landform. Restricted material include:
        - Wynn geological horizon (overburden and interburden);
        - Coaly/carbonaceous material, including oxidised coal;
        - Coal rejects; and
        - Hot material.
- Topsoil stripping (guided by soil mapping) and management in designated stockpiles.

Where possible, topsoil will be directly transported to rehabilitation areas. Where this is not possible, topsoil stockpiles will be established and away from active transport corridors.

General site soil testing has been undertaken to inform whether any amelioration of the soils (i.e. gypsum/lime or nutrients) is required prior to or during reapplication on MPO rehabilitation areas. Externally sourced materials (i.e. select rock for armouring drainage lines) is brought in as required.

Soil management is described in further detail in the MPO RMP and associated Annual Rehabilitation Report and Forward Program (and will continue to be described in future versions of the MPO RMP).

A detailed description of how salvaged habitat materials (e.g. stag trees, coarse wood debris) and collected native seed from vegetation clearance areas will be stored at the on-site Seed Harvesting Facility and used in the rehabilitation program is provided in the MPO Biodiversity Management Plan.

4.3 AREAS PROPOSED FOR NATIVE ECOSYSTEM RE-ESTABLISHMENT

In accordance with the rehabilitation objectives in Table 11 of Condition 53, Schedule 3 of Development Consent DA 92/97 (prior to its surrender) and Table 10 of Part B, Condition B87 of Development Consent SSD 10418, the proposed native ecosystem areas will aim to restore self-sustaining native woodland ecosystems characteristic of vegetation communities found in the local area.

In addition, MACH Energy is required to include development of:

- potential habitat for threatened flora and fauna species;
- riparian habitat, within any diverted and/or re-established creek lines and retained water features; and
- wildlife corridors, as far as is reasonable and feasible.

The following subsections provide a description of measures to be implemented to meet these objectives.

4.3.1 Native Woodland Ecosystems and Habitat for Threatened Flora and Fauna

Updated vegetation mapping of the MPO was undertaken by Dr Colin Driscoll (Hunter Eco) (Figure 20) for the Project EIS (MACH Energy, 2021). Extensive flora and fauna surveys have been conducted in the vicinity of the Project, most recently in 2018, 2019 and 2020 by Hunter Eco (2020) and Future Ecology (2020).

In accordance with Part B, Condition B63(f) of Development Consent SSD 10418, MACH Energy will establish 66.6 hectares (ha) of PCT 1605 and 7 ha of PCT 1602 as part of the rehabilitation program at the MPO. The measures to establish these PCT targets will be described in the revised version of the RMP under Development Consent SSD 10418.

A recent major revision to the classification of native plant assemblages of eastern NSW has established a new framework and typology inclusion in the NSW PCT schema (DPE, 2022). From this reclassification of easter NSW PCTs, a number of PCTs in relation to the Project EIS (MACH, 2021) and associated Biodiversity Development Assessment Report (Hunter Eco, 2020) have been reclassified, as outlined in Table 6.

Table 6
Relevant MPO Eastern NSW PCT Reclassification

Previous PCT (Hunter Eco, 2020)	Previous Description (Hunter Eco, 2020)	Reclassified PCT (DPE, 2022)	Reclassified Description (Hunter Eco, 2024)
483	• Grey x White Box Grassy Woodland + DNG • Grey x White Box – Spotted Gum Grassy Woodland + DNG	3395	• White Box Grassy Woodland + DNG • White Box – Spotted Gum Grassy Woodland + DNG
618	• Forest Red Gum Grassy Open Forest + DNG	3446	• Forest Red Gum Grassy Forest
1691	• Narrow-leaved Ironbark – Grey Box Grassy Woodland + DNG	3314	• Narrow-leaved Ironbark – Grey Box Grassy Woodland + DNG
1602	• Spotted Gum – Narrow-leaved Ironbark Woodland + DNG	3315	• Spotted Gum – Narrow-leaved Ironbark Woodland + DNG
1605	• Narrow-leaved Ironbark Shrubby Forest + DNG + Plantation	3431	• Narrow-leaved Ironbark Shrubby Forest + DNG + Plantation + Topsoil Stockpile
1606	• White Box – Narrow-leaved Ironbark – Blakely's Red Gum + DNG	3396	• White Box – Narrow-leaved Ironbark – Blakely's Red Gum + DNG
1655	• DNG	3485	• DNG

Note:
DNG = Derived Native Grassland.

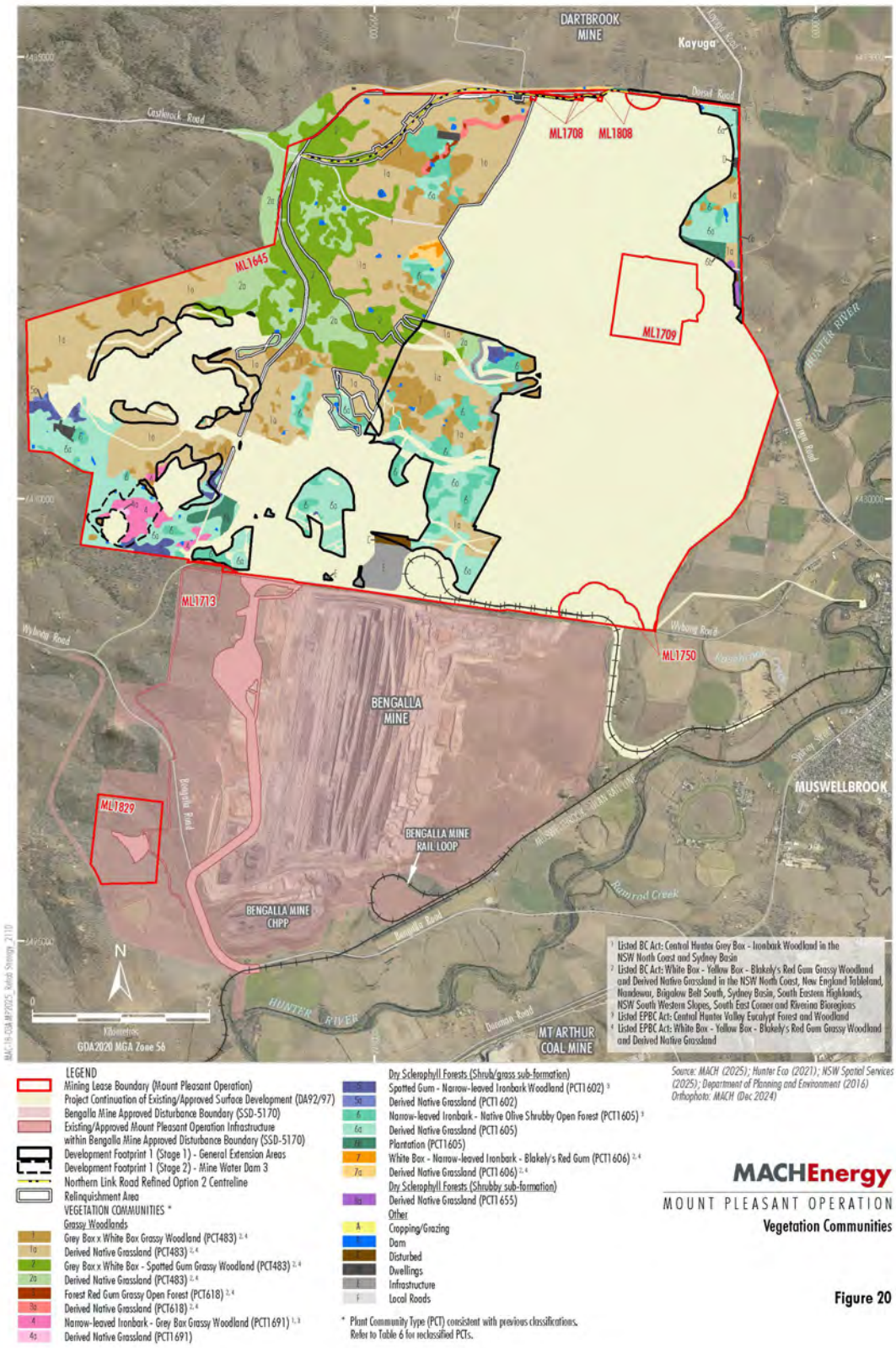

DARTBROOK MINE
Kayuga
Castlerock Road
Dorrel Road
ML1708
ML1808
ML1645
ML1709
HUNTER RIVER
Jerrys Road
ML1713
Wybong Road
ML1750
BENGALLA MINE
MUSWELLBROOK
ML1829
Bengalla Road
BENGALLA MINE RAIL LOOP
Ramrod Creek
BENGALLA MINE CHPP
HUNTER RIVER
Doonan Road
MT ARTHUR COAL MINE
N
0
2
Kilometres
GDA2020 MGA Zone 56
1 Listed BC Act: Central Hunter Grey Box - Ironbark Woodland in the NSW North Coast and Sydney Basin
2 Listed BC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions
3 Listed EPBC Act: Central Hunter Valley Eucalypt Forest and Woodland
4 Listed EPBC Act: White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
LEGEND
Mining Lease Boundary (Mount Pleasant Operation)
Project Continuation of Existing/Approved Surface Development (DA92/97)
Bengalla Mine Approved Disturbance Boundary (SSD-5170)
Existing/Approved Mount Pleasant Operation Infrastructure within Bengalla Mine Approved Disturbance Boundary (SSD-5170)
Development Footprint 1 (Stage 1) - General Extension Areas
Development Footprint 1 (Stage 2) - Mine Water Dam 3
Northern Link Road Refined Option 2 Centreline
Relinquishment Area
VEGETATION COMMUNITIES *
Grassy Woodlands
1 Grey Box x White Box Grassy Woodland (PCT483) 2,4
1a Derived Native Grassland (PCT483) 2,4
2 Grey Box x White Box - Spotted Gum Grassy Woodland (PCT483) 2,4
2a Derived Native Grassland (PCT483) 2,4
3 Forest Red Gum Grassy Open Forest (PCT618) 2,4
3a Derived Native Grassland (PCT618) 2,4
4 Narrow-leaved Ironbark - Grey Box Grassy Woodland (PCT1691) 1,3
4a Derived Native Grassland (PCT1691)
Dry Sclerophyll Forests (Shrub/grass sub-formation)
5 Spotted Gum - Narrow-leaved Ironbark Woodland (PCT1602) 3
5a Derived Native Grassland (PCT1602)
6 Narrow-leaved Ironbark - Native Olive Shrubby Open Forest (PCT1605) 3
6a Derived Native Grassland (PCT1605)
16 Plantation (PCT1605)
7 White Box - Narrow-leaved Ironbark - Blakely's Red Gum (PCT1606) 2,4
7a Derived Native Grassland (PCT1606) 2,4
Dry Sclerophyll Forests (Shrubby sub-formation)
16 Derived Native Grassland (PCT1655)
Other
A Cropping/Grazing
D Dam
E Disturbed
H Dwellings
I Infrastructure
R Local Roads
* Plant Community Type (PCT) consistent with previous classifications. Refer to Table 6 for reclassified PCTs.
Source: MACH (2025); Hunter Eco (2021); NSW Spatial Services (2025); Department of Planning and Environment (2016)
Orthophoto: MACH (Dec 2024)
MACHEnergy
MOUNT PLEASANT OPERATION
Vegetation Communities

Figure 20

Analysis of this vegetation mapping indicates that the most widespread PCTs being disturbed by the MPO are the following:

- PCT 3395[1] – White Box – Spotted Gum Grassy Woodland and Derived Native Grassland (DNG).
- PCT 3315[2] – Spotted Gum – Narrow-leaved Ironbark Woodland.
- PCT 3431[3] – Narrow-leaved Ironbark Shrubby Forest Woodland and DNG.

These communities will be targeted for rehabilitation on appropriate slopes, as ecosystems characteristic of vegetation communities found in the local area and also to provide potential habitat for threatened flora and fauna. In addition to these key PCTs, PCT 1543 *Rusty Fig - Native Quince - Native Olive dry rainforest of the Central Hunter Valley* was trialled in aspect planting (i.e. targeted suitable areas) surrounding drainage areas of rehabilitated landforms. PCT 1543 occurs surrounding riparian areas within the local Muswellbrook region and often associated with/occurs adjacent to PCT 1605 (reclassified as PCT 3431 – Table 6). Supporting information regarding the suitability of PCT 1543 was provided to the DPIE (now DPHI) with the submission of Version 2 of the Rehabilitation Strategy.

The eastern face of the final landform will be targeted for revegetation using the species characteristic of these PCTs as conceptually shown on Figures 14 and 15 (i.e. Domain A – Native Woodland/Grassland) and Figure 20. These PCTs are proposed to provide potential habitat (in the long-term) for threatened flora and fauna that have been previously recorded in the area, including:

- Woodland birds:
  - Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*).
  - Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*).
  - Speckled Warbler (*Chthonicola sagittata*).
  - Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis gularis*).
  - Diamond Firetail (*Stagonopleura guttata*).
  - Varied Sittella (*Daphoenositta chrysoptera*).
- Mammals:
  - Squirrel Glider (*Petaurus norfolcensis*).
  - Spotted-tailed Quoll (*Dasyurus maculatus*).
  - Eastern Freetail-bat (*Mormopterus norfolkensis*).
  - Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*).
  - Eastern Bentwing-Bat (*Miniopterus schreibersii oceanensis*).
  - Grey-headed Flying-fox (*Pteropus poliocephalus*).
  - Eastern False Pipistrelle (*Falsistrellus tasmaniensis*).
  - Southern Myotis (*Myotis macropus*).
  - Greater Broad-nosed Bat (*Scoteanax rueppellii*).
  - Eastern Cave Bat (*Vespadelus troughtoni*).
- Flora:
  - Tiger Orchid (*Cymbidium canaliculatum*) – Endangered Population in the Hunter Catchment.

[1] Previously referred to as PCT 483.

[2] Previously referred to as PCT 1604.

[3] Previously referred to as PCT 1605.

Provisional species lists for the target PCT communities targeted for revegetation of the MPO (as well as a targeted native grass and sterile cover crop species list) is provided in Table 7. These species lists and seed mixes may be subject to amendment due to availability from MPO's Seed Harvesting Facility and/or from external providers. It is anticipated that the provisional list of species for the target PCTs will be further augmented and refined over the life of the MPO based on the results of rehabilitation monitoring, on-site rehabilitation investigations and trials and consultation with key stakeholders.

These species lists have been developed in consultation with specialist ecologists, including Greg Major, a Restoration Ecologist, and Dr Carmen Castor who has 18 years' experience in research in mine site native ecosystems rehabilitation in the Hunter Valley. Supporting information, prepared by Greg Major and Dr Castor, regarding development of, and justification for, the species lists for the target PCTs, was provided to the DPIE (now DPHI) with the submission of Version 2 of this Rehabilitation Strategy. Alternate native species relevant to the target rehabilitation PCTs have also been identified that could be used in the rehabilitation program in the event of limited seed supply.

A revegetation rationale has been developed to guide where each PCT will be re-established on MPO final landforms (e.g. Ironbark communities would be more suited to upper slope areas and Grey Box – White Box communities would be more suited to lower slopes and flatter areas). The annual rehabilitation plans include details of target PCTs and PCT planting plans/maps. Consistent with the MSC's recommendations, highly competitive exotic grasses (e.g. Rhodes Grass [*Chloris gayana*]) and non-local Australian species (e.g. Golden Wreath Wattle [*Acacia saligna*]) will not be used anywhere on-site.

Table 7
Plant Community Types and Provisional Species Lists Proposed for Native Ecosystem Rehabilitation

Species	Common Name
PCT 3395[4] Grey Box/White Box Grassy Open Woodland	
Eucalyptus moluccana	Grey Box
E. albens	White Box
E. melliodora	Yellow Box
Angophora floribunda	Rough-bark Apple
Brachychiton populneus	Kurrajong
Notelaea microcarpa	Native Olive
Psydrax odorata	Shiny-leaved Canthium
Acacia falcata	Falcata Wattle
Acacia decora	Western Golden Wattle
Acacia paradoxa	Kangaroo Thorn
Acacia decurrens	Green Wattle
Dodonaea viscosa	Hop Bush
Daviesia ulicifolia	Gorse-bitter Pea
Sida hackettiana	Spiked Sida
Calotis lappulacea	Burr Daisy
Einadia hastata	Nodding Saltbush
Enchylaena tomentosa	Ruby Saltbush
Atriplex semibaccata	Creeping Saltbush
Einadia trigonos	Fishweed
Native grass and sterile cover crop mix (see below)	

[4] Previously referred to as PCT 483.

Table 7 (Continued)
Plant Community Types and Provisional Species Lists Proposed for Native Ecosystem Rehabilitation

Species	Common Name
PCT 3431[5] Narrow leaved Ironbark / Native Olive Shrubby Open Forest	
Eucalyptus crebra	Narrow-leaved Ironbark
Notelaea microcarpa	Native Olive
Myoporum montanum	Boobialla
Olearia elliptica	Sticky Daisy Bush
Breynia oblongifolia	Coffee Bush
Acacia paradoxa	Kangaroo Wattle
Acacia falcata	Falcate Wattle
Acacia decora	Western Golden Wattle
Dodonaea viscosa	Hop Bush
Sida hackettiana	Spiked Sida
Lomandra longifolia	Matt Rush
Solanum cinereum	Nawarra Burr
Calotis lappulacea	Burr Daisy
Einadia hastata	Nodding Saltbush
Enchylaena tomentosa	Ruby Saltbush
Atriplex semibaccata	Creeping Saltbush
Native grass and sterile cover crop mix (see below)	

[5] Previously referred to as PCT 1605.

Table 7 (Continued)
Plant Community Types and Provisional Species Lists Proposed for Native Ecosystem Rehabilitation

Species	Common Name
PCT 3315[6] Narrow leaved Ironbark/ Grey Box/ Spotted Gum Shrub / Grass Woodland	
Eucalyptus moluccana	Grey Box
E. crebra	Narrow-leaved Ironbark
Corymbia maculata	Spotted Gum
Eucalyptus tereticornis	Forest Red Gum
Eucalyptus fibrosa	Broad-leaved Ironbark
Acacia parvipinnula	Silver-stem Wattle
Acacia amblygona	Fan Wattle
Bursaria spinosa	Blackthorn
Olearia elliptica	Sticky Daisy Bush
Dodonaea viscosa	Hop Bush
Acacia decora	Western Golden Wattle
Acacia paradoxa	Kangaroo Thorn
Daviesia ulicifolia	Gorse Bitter Pea
Acacia falcata	Falcate Wattle
Indigofera australis	Native Indigo
Kunzea ambigua	Tick Bush
Breynia oblongifolia	Coffee Bush
Allocasuarina luehmannii	Bull Oak
Einadia hastata	Nodding Saltbush
Enchylaena tomentosa	Ruby Saltbush
Atriplex semibaccata	Creeping Saltbush
Sida hackettiana	Spiked Sida
Dysphania carinata	Green Crumbweed
Native grass and sterile cover crop mix (see below)	

[6] Previously referred to as PCT 1604.

Table 7 (Continued)
Plant Community Types and Provisional Species Lists Proposed for Native Ecosystem Rehabilitation

Species	Common Name	Species	Common Name
TRIAL PCT 1543 Rusty Fig – Native Quince – Native Olive Dry Rainforest of the Central Hunter Valley			
Alectryon subcinereus	Native Quince	*Geijera parvifolia*	Wilga
Ficus rubignosa f rubignosa	Rusty Fig	*Geijera salicifolia*	Scrub Wilga
Melia azedarach	White Cedar	*Olearia elliptica*	Sticky Daisy Bush
Allocasuarina torulosa	Forest Oak	*Teucrium juncea*	Bead Bush
Angophora floribunda	Rough-barked Apple	*Einadia trigonos*	Fishweed
Brachychiton populneus	Kurrajong	*Lomandra longifolia*	Matt Rush
Casuarina cunninghamiana	River Oak	*Carex appressa*	Tall Sedge
Acacia falcata	Falcate Wattle	*Enchylaena tomentosa*	Ruby Saltbush
Acacia decora	Western Golden Wattle	*Sida hackettiana*	Spiked Sida
Acacia paradoxa	Kangaroo Thorn	*Dysphania carinata*	Green Crumbweed
Acacia implexa	Hickory	*Gahnia aspera*	Saw Sedge
Dodonaea viscosa	Hop Bush	*Atriplex semibaccata*	Berry Saltbush
Melicope micrococca	White Euodia	Native grass and sterile cover crop mix	
Myrsine howittiana	Brush Muttonwood		
Myrsine variabilis	Muttonwood		
Streblus brunonianus	Whalebone Tree		
Clerodendrum tomentosum	Hairy Clerodendrum		
Notelaea microcarpa	Native Olive		
Breynia oblongifolia	Coffee Bush		
Bursaria spinosa	Blackthorn		
Ficus coronata	Sandpaper Fig		

Table 7 (Continued)
Plant Community Types and Provisional Species Lists Proposed for Native Ecosystem Rehabilitation

Species	Common Name
Native Grass and Sterile Cover Crop Mix*	
Aristida mix (includes *A. ramosa, A. vagans*)	Purple Wiregrass, Threeawn Speargrass
Austrodanthonia mix (includes *A. setacea, A. fulva, A. caespitosa*)	Smallflower Wallaby Grass, Wallaby Grass, Ringed Wallaby Grass
Austrostipa scabra	Speargrass
Austrostipa verticillata	Slender Bamboo Grass
Bothriochloa macra and B. decipiens	Red Grass
Dichelachne micrantha	Shorthair Plumegrass
Chloris truncata	Windmill Grass
Cymbopogon refractus	Barbed Wire Grass
Dichanthium sericeum	Queensland Bluegrass
Microlaena stipoides	Weeping grass
Panicum effusum	Hairy Panic
Eragrostis sp.	Lovegrass
Elymus scaber	Common Wheatgrass
Digitaria sp.	Umbrella Grass
Sporobolus creber	Western Rat-tail Grass
Themeda triandra	Kangaroo Grass
Cynodon dactylon #	Couch Grass
Echinochloa esculenta #	Japanese Millet
Avena sativa #	Oats

* Includes but is not limited to the above species and includes species endemic to the area.
\# Sterile cover crop species.

Any changes to the provisional species list will be reviewed by specialist ecologists for their appropriateness to the target Plant Community Types for rehabilitation and addressed in future updates to the Rehabilitation Strategy and all other relevant management plans (i.e. RMP, Biodiversity Management Plan and the EPBC Threatened Ecological Community Mine Site Rehabilitation Plan).

Habitat features including habitat/stag trees, rock piles and log piles, will be installed to provide fauna habitat across MPO rehabilitation areas. Where practicable, a minimum of two habitat/stag trees, two log piles and two rock piles will be installed per hectare across Secondary Domain A – Native Woodland/Grassland areas (excluding inappropriate areas e.g. drainage features and water managements structures within Secondary Domain A). Where this is not possible, further augmentation of habitat will consider the use of supplementary features such as nest and bat boxes.

The habitat requirements of the fauna species outlined above in this section will be considered when selecting and placing features across the landscape. Habitat/stag trees will be selected based upon the presence of hollows, loose bark, height and branches for nesting. Rock for rock piles where possible will be of sandstone of similar material. Log piles will be used to recreate 'fallen timber' within the landscape, and will be placed parallel to the contour to minimise potential downslope erosion.

4.3.2 Riparian Habitat

The main drainage feature within the vicinity of the MPO is the Hunter River which flows in a southerly direction approximately 1 km to the east of the MPO area. The pre-mining environment of the MPO consists of a number of ephemeral drainage lines that drain to the Hunter River, however no perennial streams/creeks exist on-site.

The final landform design will contain ephemeral drainage lines as conceptually shown by blue lines on Figures 14 and 15. These drainage lines will be targeted for the creation of riparian habitat. As described in Section 4.2.4, final landform drainage lines will be designed to accommodate natural erosive processes and will incorporate geomorphic characteristics such as nature of bed material (e.g. particle size), presence of rock outcrops, bed features (such as cascades, pool and riffle zones) as well as bed and bank vegetation. The detailed design will involve modelling and other similar catchment/drainage and landform design software to determine specific locations and design features of drainage line/riparian habitat areas.

As described in Section 4.3.1, PCT 1543 *Rusty Fig – Native Quince – Native Olive dry rainforest of the Central Hunter Valley* is being trialled in aspect planting surrounding drainage areas of rehabilitated landforms. PCT 1543 is being trialled due to its association with PCT 1605 (reclassified as PCT 3431 – Table 6) and presence surrounding riparian areas within the local Muswellbrook region.

MACH Energy will consider the incorporation of PCT 1543 into the rehabilitation planning if trials are successful, and will continue to provide updates on the outcomes of rehabilitation trials in the MPO Annual Review.

The main retained water features in the final landform will be the final void and potentially the Mine Water Dam on the southern ML boundary (Figures 14 and 15).

Revegetation of the void walls/batters will use species that are appropriate for its steepness and aspect, however this is not envisaged to create a riparian ecosystem, rather, this vegetation will be used for stabilisation and aesthetic purposes.

In accordance with Development Consent DA 92/97 (prior to its surrender), the Mine Water Dam at the southern ML boundary (Figure 14) will potentially be retained to support agricultural land uses and provide conditions for establishment of riparian habitat. If the water storage is retained, vegetation species occurring in riparian areas of the surrounds will be used for revegetation. Species which may be targeted for revegetation of this area will include:

- Upper stratum – River Red Gum (*Eucalyptus camaldulensis*), River Sheoak (*Casuarina cunninghamiana* subsp*. Cunninghamiana*), Rough-barked Apple (*Angophora floribunda*).
- Middle stratum – Tree Violet (*Melicytus dentatus*), Willow Bottlebrush (*Callistemon salignus*).
- Lower stratum – Slender Bamboo Grass (*Austrostipa verticillata),* Wallaby Grasses (*Rytidosperma* spp.)*,* Couch Grass (*Cynodon dactylon*)*,* Weeping Grass (*Microlaena stipoides*)*,* Red Grass (*Bothriochloa macra*)*,* Tall Spike-rush (*Eleocharis sphacelata*)*,* Spiny-headed Mat-rush (*Lomandra longifolia*)*,* Tall Sedge (*Carex appressa*)*.*

However, in accordance with Development Consent SSD 10418, water management structures that are not to be retained in the final landform will be decommissioned (i.e. dam walls removed, drained and backfilled). Mine water dams will be emptied and discharge water will be disposed of in the final void (Figure 15). Dams that are to remain post closure will be desilted. Sediments accumulated in mine water and sediment dams will be removed from the dam floor and emplaced in the final void.

During the operational phase of the MPO, riparian vegetation (including sedge and rush species) will also be established around sediment dams to provide areas of riparian habitat.

4.3.3 WILDLIFE CORRIDORS

Consistent with MSC's recommendations for the Bengalla Mine final landform, the eastern face of the MPO final landform will be revegetated with native tree, shrub and grass species as shown in Figure 14 (i.e. Secondary Domain A – Native Woodland/Grassland) and Figure 15. This will allow the landform to assimilate with the open woodland communities in the surrounding environment.

The revegetated eastern face will provide a contiguous wildlife corridor with the revegetated eastern face of the Bengalla Mine for native woodland bird species (Figures 14 and 15). Given the close proximity of the revegetated woodland areas, bird species could utilise both areas for habitat establishment and foraging. In addition, the vegetation on the eastern face of the MPO Eastern Out of Pit Overburden Emplacement will develop a contiguous wildlife corridor with the Bengalla Mine rehabilitation and surrounding remnant woodland, and also be visually consistent with the revegetation of the eastern face of the Bengalla Mine landform. As described in Section 4.3.1, standing dead stag/habitat trees will be installed across the MPO Eastern Out of Pit Overburden Emplacement to provide immediate habitat 'stepping stones' prior to development of planted trees over the next few decades.

MACH Energy has undertaken preliminary consultation with the Bengalla Mining Company regarding integration of rehabilitation across the MPO and the Bengalla Mine. MACH Energy proposes to continue collaboration with the Bengalla Mining Company by (for example) undertaking joint rehabilitation workshops to discuss rehabilitation strategies, revegetation species and implementation measures. MACH Energy is committed to information sharing to facilitate integration of rehabilitation across the MPO and the Bengalla Mine.

MACH Energy has also established a "connectivity corridor" on buffer lands to the east of the site and adjacent to the Hunter River. The objective of the "connectivity corridor" is to connect the Hunter River Riparian one to the mine rehabilitation for fauna ingress and egress, with tube stock planting having been undertaken in 2021.

4.4 AREAS PROPOSED FOR AGRICULTURAL LAND

During consultation, MSC indicated a preference for the option of intensive agricultural/industrial post-mining land uses that provide potential employment for the local community. Consequently, rehabilitation of the MPO will consider both low and high intensity agricultural land uses subject to Land Capability Assessments. Low intensity agriculture will consist of reinstating grazing capability. High intensity agriculture will be targeted on former infrastructure sites with low slopes and internal drainage, and may include, for example, feedlots, poultries or agricultural produce processing facilities, and glasshouses. However, until such a time a proposal is developed for such uses, these areas will be rehabilitated to low intensity agriculture. Descriptions of currently proposed low and high intensity agriculture post mining land uses is provided below. These land uses may be refined through further consultation with MSC and other stakeholders (including the MPO's CCC) during the MPO mine life.

Agricultural Land Rehabilitation

Following landform reconstruction using the strategies described in Section 4.2.4, areas proposed for agricultural land rehabilitation in accordance with Development Consent SSD 10418 (Figure 15) will be prepared to accommodate sustainable/managed livestock grazing. The objective will be to implement reasonable and feasible measures to establish areas to be classified as Land Capability Class 3 or 4, or where this is not reasonable or feasible to achieve Class 5 or Class 6 lands. The definitions of Land Capability Classes 3, 4, 5 and 6 are provided in Table 8 (consistent with the OEH [2012] *The land and soil capability assessment scheme: second approximation – a general rural land evaluation system for New South Wales*).

It should be noted that although the definitions of Land Capability Class 5 and 6 lands include land uses such as forestry and nature conservation (in addition to grazing), MACH Energy does not propose to establish forestry on the rehabilitation areas proposed for low intensity or high intensity agriculture.

Table 8
Land Capability Classes – General Definitions

Class	Definition
3	**High capability land:** Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices. However, careful management of limitations is required for cropping and intensive grazing to avoid land and environmental degradation.
4	**Moderate capability land**: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture. These limitations can only be managed by specialised management practices with a high level of knowledge, expertise, inputs, investment and technology.
5	**Moderate–low capability land**: Land has high limitations for high-impact land uses. Will largely restrict land use to grazing, some horticulture (orchards), forestry and nature conservation. The limitations need to be carefully managed to prevent long-term degradation.
6	**Low capability land**: Land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation. Careful management of limitations is required to prevent severe land and environmental degradation.

Source: OEH (2012).

Low intensity agricultural rehabilitation areas will be cultivated and broadcast sown with suitable pasture species. The species mix will be developed in consultation with an Agronomist, and depend on the growth media available and environmental conditions at the time of rehabilitation. Species selection will aim to minimise encroachment on rehabilitation areas proposed for native ecosystem re-establishment.

Improved pasture species commonly present in the surrounding grazing areas to the MPO that will be considered for rehabilitation of low intensity agricultural areas include:

- Subterranean Clover (*Trifolium subterranean*).
- White Clover (*Trifolium repens*).
- Lucerne (*Medicago sativa*).
- Green Panic (*Panicum maximum var. trichoglume*).
- Kikuyu Grass (*Pennisetum clandestinum*).
- Perennial Ryegrass (*Lolium perenne*).
- Phalaris (*Phalaris aquatica*).
- Oat (*Avena sativa*).

Native grass species will also be considered in pasture species mixes such as Couch Grass Wallaby grasses and Spear grasses (*Austrostipa* spp.) which have been shown to develop well in post-mining landscapes of the Hunter Valley (Huxtable, Koen and Waterhouse, 2005).

Highly competitive exotic grasses (e.g. Rhodes Grass [*Chloris gayana*]) and non-local Australian species (e.g. Golden Wreath Wattle [*Acacia saligna*]) will not be used.

Areas on the final landform likely to be lower in soil moisture (e.g. steeper terrain) will be targeted for establishment of native grasses due to their ability to withstand such conditions in comparison to introduced pasture species.

Fines Emplacement Area Rehabilitation

The overarching objective for rehabilitation of the Fines Emplacement Area is to establish a safe, stable and non-polluting landform with a sustainable surface cover that minimises erosion (to prevent exposure of the underlying fines material) and sustains grassland vegetation in the long-term.

The current rehabilitation concepts and conceptual closure design for the Fines Emplacement Area include capping fines with a layer of inert overburden material and then a layer of topsoil, as described in the MPO EIS and Project EIS (MACH Energy, 2021). MACH Energy maintains capping and topsoil material proximal to the Fines Emplacement Area that would be sufficient to rehabilitate each stage of the Fines Emplacement Area. MACH Energy maintains a soil register to track soil stockpile volumes and soil usage on rehabilitation areas.

Notwithstanding, MACH Energy will continue to develop the final landform rehabilitation concepts which will be guided by relevant industry guidelines, including the Australian National Committee on Large Dams (ANCOLD) *Guidelines on Tailings Dams* (2019). To support this process, MACH Energy will continue to undertake periodic analysis of emplaced fines (e.g. in-situ geotechnical properties) and will consult with the NSW Resources Regulator on the findings of these analyses. Such a review is currently being conducted as part of ongoing consultation with the NSW Resources Regulator with respect to Stage 1 of the Fines Emplacement Area, which includes evaluation of potential fines capping options and requirements.

MACH Energy has also entered into a collaboration agreement with the University of Newcastle on the Australian Coal Association Research Program (ACARP) Project “Tailings to topsoil” (#C29042) which commenced in January 2020 and is still ongoing. The outcomes of this study may also lead to some variation to final land use objectives, or rehabilitation techniques for the Fines Emplacement Area. The progress and outcomes of this study have been and will continue to be reported in the MPO Annual Review.

In accordance with Condition 52(c), Schedule 3 of the MPO’s Development Consent DA 92/97, a Fines Emplacement Plan was prepared and is provided in Appendix 1 of the MPO’s Waste Management Plan. The Fines Emplacement Plan includes details of the Fines Emplacement Area design and fine rejects disposal strategies and operating procedures. MACH Energy will maintain a Fines Emplacement Plan for the Fines Emplacement Area design approved under Development Consent SSD 10418.

MACH Energy operates the Fines Emplacement Area using sub-aerial deposition which involves an extended period of air drying that maximises in-situ tailings densities and in turn maximises the storage efficiency of the facility as well as providing a more competent fines surface for future rehabilitation purposes. Other advantages of sub-aerial deposition include earlier facilitation of final rehabilitation due to a more competent fines surface and rapid recovery of water for reuse in the plant process. MACH Energy has completed construction of a permanent flocculant plant to dose secondary flocculant at the discharge point into the Fines Emplacement Area which will assist deposited fines to settle more quickly and release water to decant at a faster rate than conventional settling would allow.

Based on the current closure concepts, post-mining drainage off the Fines Emplacement Area will be established following the progressive placement of capping material, topsoiling and rehabilitation. The final surface of the Fines Emplacement Area prior to capping will reflect the deposition strategy employed over the life of the Project. As the fine rejects deposit at a relatively low angle (MACH Energy, 2021), the facility fines surface and capping material will be gently sloping away from the primary locations of fine rejects deposition, effectively filling the majority of the valley in which the facility is located. By altering the location of fine rejects deposition within the facility over the life of the Project,

MACH Energy could alter the location of the decant pond on the fines surface, and minimise materials handling to establish its preferred post-mining drainage features.

The post-mining drainage design for the Fines Emplacement Area will be developed to maintain the facility in a manner that is safe, stable and non-polluting. Consistent with the Project Surface Water Assessment (Hydro Engineering and Consulting, 2020), drainage from the Fines Emplacement Area surface will be directed back into the Sandy Creek catchment post-mining, to re-instate catchment excised during operation of the facility.

The MACH Energy current conceptual post-mining drainage design for the Fines Emplacement Area includes:

- Placement of some additional inert overburden material at the toe of the embankment to facilitate an overall concave outer embankment slope varying from approximately 1:3 to 1:6 and designed to minimise concentration of incident runoff on the embankment.
- Placement of inert overburden material on the surface of the emplacement to facilitate rehabilitation capable of supporting low intensity agricultural use, with micro-relief installed as required to direct runoff to drainage channels.
- The final surface of the Fines Emplacement Area will be free-draining, with water only ponding during significant storm events to limit peak flows off the facility.
- Establishment of low gradient drainage features, bunds or other structures on the surface of the facility to direct incident rainfall off the facility at low velocity.
- Construction of an outlet channel for runoff collected on the surface of the facility through natural ground (e.g. a short cutting through in-situ rock) into the adjoining natural catchment, including the construction of any stilling or flow retention structures that may be required to minimise the potential for erosion, but still avoid development of a perched phreatic surface within the emplaced fines.

Based on the above, Golder Associates Pty Ltd has developed an initial conceptual post-mining design for the Project Fines Emplacement Area for MACH Energy, that is illustrated on Plate 10. This initial design concept will be periodically revisited over the life of the Project in consultation with the NSW Resources Regulator as more data is collected on fines physical properties, and any updates would be documented in subsequent revisions of this Rehabilitation Strategy and MPO RMP. This will include provision for settlement of the final surface based on consolidation observed during fines emplacement construction.

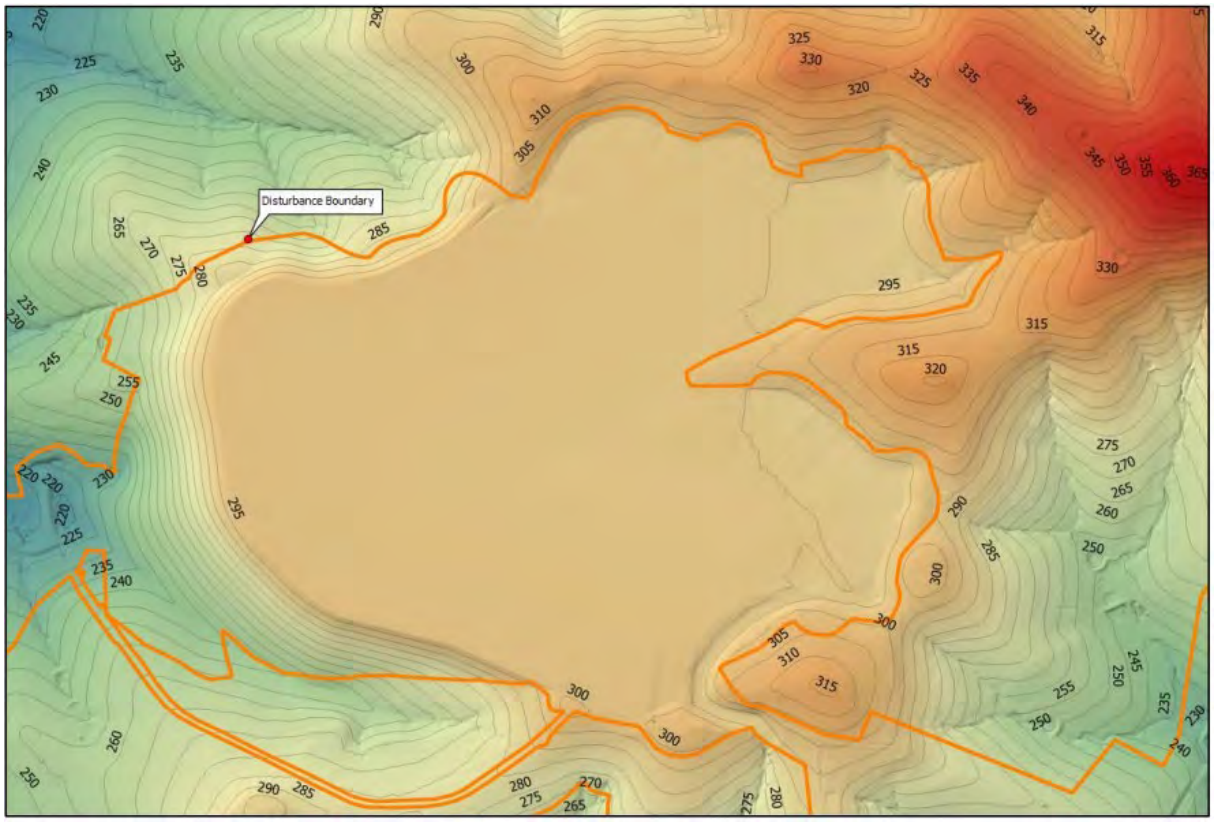


Plate 10
Plan View of Post-Mining Concept - Fines Emplacement Area

MACH Energy has completed the Fines Emplacement Area Stage 1 Rehabilitation and Closure Strategy (SLR, 2021) and will continue to develop and update this Strategy following each staged lift of the Fines Emplacement Area.

The Fines Emplacement Area Stage 1 Rehabilitation and Closure Strategy addresses the following recommendations from the NSW Resources Regulator:

- The MPO should ensure the Fines Emplacement Area performance requirement to support the final land use is defined and the capping design is determined, including capping material types, thickness and engineering treatments (e.g. capillary breaks).
- The MPO should ensure that sufficient material is set aside to facilitate the future capping of the Fines Emplacement Area.

MACH Energy will continue to develop the final landform rehabilitation concepts which will be informed by the results of future tailings characterisation testwork and research project results (Section 9), geotechnical sampling, soil sampling and mapping, water quality and geochemistry results, dam compaction testing, groundwater and piezometer data and other research project results and will be guided by relevant industry guidelines (e.g. *Guidelines for the Decommissioning of Tailings Facilities* [NSW Resources Regulator, 2020] and *Guidelines on Tailings Dams* [Australian National Committee on Large Dams, 2019]). Future Fines Emplacement Area works will be described in detail in future revisions of the MPO RMP[7] and this Rehabilitation Strategy.

[7] As of 1 August 2022, MPO operates under a RMP along with the supporting Annual Rehabilitation Report and Forward Program which has replaced the 2021-2023 MOP/RMP.

High Intensity Agriculture

High intensity agriculture areas have been proposed as a result of consultation with MSC who has indicated its preference for post mining land uses that may provide local employment. Activities that may be classed as high intensity agriculture include, for example, feedlots, poultries or agricultural produce processing facilities, and glasshouses. Until such a time a proposal is developed for such uses, these areas will be rehabilitated to low intensity agriculture. Areas proposed for high intensity agriculture have been identified on Figure 14 and 15, and have been nominally located at this stage due to their topography and proximity to a potential water storage dam (for water supply) in the final landform.

In order to stabilise and minimise erosion from the proposed high intensity agriculture areas, the following will be undertaken:

- reconstruction of the landform as described in Section 4.2.4;
- installation of drainage, erosion and sediment control features (Section 4.2.4); and
- sowing of pasture species similar to areas of low intensity agriculture to stabilise the surface.

High intensity agriculture areas will be refined in consultation with MSC throughout the life of the MPO and will depend on such factors as commercial interest. Subject to further consultation, the MOD 4 rail loop (Stage 2 rail loop) and corridor may be maintained in the final landform as a valuable facility to support the potential high intensity agricultural activities (MACH Energy, 2021). Any development of high intensity agriculture (and the possible retainment of the MOD 4/Stage 2 rail loop/corridor) will be subject to development approval, as necessary, with the relevant consent authority. If the MOD 4/Stage 2 rail loop/spur is not to be retained, the conveyors and rail infrastructure will be removed, the rail corridor cut and fill areas regraded and the rail corridor and rail loop will be rehabilitated (Figure 15).

Agricultural Land Use in the Vicinity of the Project

MACH Energy currently leases non-mining MACH Energy-owned agricultural land to original landowners or other local farmers for ongoing productive use, and this practice would continue for the Project. MACH Energy also undertakes its own agricultural activities on some land.

A range of agricultural enterprises are also located on private land in the vicinity of the MPO. Proximal private agricultural land is largely subject to cattle grazing in the north and west, and a variety of more intensive land uses on the Hunter River floodplain to the east (including dairy farming and irrigated cropping).

MACH Energy has approached the design of the Project and its relationship with nearby agricultural enterprises with the following aims:

- being open to the feedback of nearby agricultural enterprises on the existing impacts of the MPO;
- facilitating ongoing agricultural production on available MACH Energy-owned lands and the productive use of MACH Energy water resources that are not presently required for mining; and
- incorporating staging in the Project design to reduce potential incremental MPO impacts on nearby residences, including proximal agricultural enterprises.

Grazing, cultivation and routine agricultural management activities may be undertaken on MACH Energy-owned land by MACH Energy or other parties with prior approval (e.g. under licence). Grazing and agricultural practices will be undertaken so as to not overstock the property and to avoid overgrazing, having regard to seasonal conditions. Any grazing or agricultural activities will be undertaken on existing suitably cleared farming land, and will not involve the additional clearing of remnant native vegetation.

4.5 FINAL VOID

Design alternatives for the final void were previously evaluated and prepared as part of the closure planning process at the MPO. In February 2021, MACH Energy conducted a 'think tank' exercise involving a diverse range of professionals to discuss options for the final land use of the MPO's final void and to identify which options merit further study.

As part of the Project EIS (MACH Energy, 2021), MACH Energy undertook a comprehensive approach to the final void design based on the following key design principles:

- The final void has been designed as a long-term groundwater sink to maximise groundwater flows from the Eastern Out-of-Pit Emplacement to the final void.
- The final void (and associated drainage network) will be shaped to reflect a less engineered profile that is more consistent with the surrounding natural environment.

Although for the Project, backfilling the void is uneconomic (MACH Energy, 2021), MACH Energy is committed to minimising the risk to the community through effective mine planning and thorough the development of effective final void design. MACH Energy has re-designed the final void to:

- backfill approximately 1.5 km of the northern part of the final void;
- reduce the depth of the final void in the North and Central Pit areas and decrease the slope of the internal batters;
- apply geomorphic design concepts to parts of the Project landform that drain to the final void; and
- push down the western highwall to an overall angle of approximately 18 degrees.

As a result of the above, the final void is considered safe, geotechnically stable and minimises the catchment reporting to the void whilst still maintaining geomorphic design concepts (i.e. providing sufficient slope length to improve post-mining stability and reduce long-term erosion risk) (MACH Energy, 2021). Additionally, the stable mining slopes associated with the final void highwalls would be flattened to a slope with an overall angle of about 18 degrees or less. The factors of safety (FoS) for the rock buttress is approximately 1.5 and therefore the slopes that it supports are conserved to be in a geotechnically acceptable configuration (GeoTek Solutions, 2020).

The easternmost extent of the MPO mine landform is located outside of the 1% AEP flood extent for the Hunter River. The potential for the mine landform to result in changes to flood depth, extent or velocity in the vicinity of the MPO is considered to be negligible (Hydro Engineering and Consulting, 2020).

Additionally, the final void will act as a groundwater sink, reducing the potential for groundwater quality impacts. It will be located closer to the Fines Emplacement Area, drawing seepage towards the final void, as opposed to the Sandy Creek alluvium. The greater depth of the final void will also increase the hydraulic gradient from the Eastern Out-of-Pit Emplacement towards the final void, reducing the potential for seepage towards the Hunter River alluvium. Seepage from the MPO is also predicted to report to the Bengalla final voids.

The revised final void water balance (AGE Consultants, 2021) demonstrates that the water level will remain significantly below the crest of the final void. The final void water level is predicted to be approximately 75 meters Australian Height Datum (m AHD), 125 m below the spill level (i.e. the final void is contained) (Figure 17).

Once mining operations cease, water in the final void would no longer be collected and pumped out, and as a result, the void would gradually begin to fill with water. Water in other on-site operational storages may also be transferred to the final void to facilitate decommissioning and rehabilitation (MACH Energy, 2021).

The final void presented in the Project EIS (MACH Energy, 2021) will gradually fill with water until it reaches an equilibrium, below the crest (i.e. the void will not overflow). Given the void would act as a groundwater sink, final void salinity levels would increase slowly as a result of evapo-concentration (Hydro Engineering and Consulting, 2020). Over the life of the Project, MACH Energy will continue to consider potential alternative and feasible beneficial uses of the final void, including:

- Opportunities for renewable energy projects (e.g. floating solar facility and/or pumped hydro), including consideration of advancements in renewable energy technology that may occur over the life of the Project.
- The potential application of evaporative controls to maintain water quality suitable for productive use and/or to provide a significant off-river storage of supplementary water flows in the Hunter River.
- Waste disposal, taking advantage of the final void sink to avoid the migration of any related contaminants off-site.

The potential alternative beneficial uses of the final void is further discussed in Section 6.

Mine closure planning is integral to life of mine planning and requires progressive review over the life of a mine. In order to achieve the rehabilitation objectives (Table 3) for the final void, MACH Energy will consider the following factors throughout the life of the Project:

- The ongoing refinement of MPO life of mine (MPO Rehabilitation Management Plan) will consider final void implications at each stage of planning.
- Due to the dynamic nature of mining and closure planning, this process requires regular and critical review to reflect changing circumstances. Accordingly, to achieve a safe, stable and non-polluting final void, the final void positions/size/characteristics will be refined in each mine plan iteration and throughout the life of the mine.
- Design alternatives for the final void will be continually evaluated and will be prepared as part of the closure planning process at the MPO (Section 6).

The design of the voids will be continually reviewed over the life of the mine as mining progresses in consideration of the above listed void design principles and documented in the regular reviews of this Rehabilitation Strategy (at least every three years) (Section 7.2). Further detail on the final voids will also be included in the detailed Mine Closure Plan (i.e. generally within 5 years of cessation of mining).

4.6 WATER QUALITY MANAGEMENT

Water runoff from the post-mining landform will either be retained on-site or will runoff/discharge to the surrounding environment. The quality of water retained on-site will be managed to be suitable for its proposed post-mining land use (e.g. low or high intensity grazing, native ecosystem). Water quality of runoff to the surrounding environment will be managed to be similar to waterways in the immediate catchment area. Measures proposed to manage water retained on-site and discharged off-site will include:

- The final landform will incorporate design features to minimise water runoff velocity and erosion potential such as micro and macro relief, a combination of convex and concave outer batters, and gentler slope gradients.
- Revegetation will be undertaken on all mine landforms in accordance with its proposed final land use.
- Erosion and sediment control structures will remain in place (where required) (e.g. rock armour, drains) or until the catchment is rehabilitated and discharge water quality is similar to comparable undisturbed landforms (e.g. silt fencing, sediment dams).
- Mine water dams and sediment dams will be desilted if containing carbonaceous material prior to being reshaped and rehabilitated (except for permanent water management structures and storages agreed to be retained in the final landform).
- Permanent water management structures will be designed and constructed, in accordance with best practice guidelines, including Landcom (2004) *Managing Urban Stormwater: Soils and Construction Volume 1, 4th Edition* (or latest version) and Department of Environment and Climate Change (2008) *Managing Urban Stormwater: Soils and Construction Volume 2* (or latest version).

Detailed management measures to ensure runoff is suitable for receiving waters and fit for aquatic ecology and riparian vegetation will be developed as part of mine closure planning and described in the MPO RMP.

Hazardous and Contaminated Materials

Hazardous materials will be stored on site in accordance with the NSW *Work Health and Safety Act 2011* and supporting *Work Health and Safety Regulation 2017* and the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and the supporting *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014*.

Procedures and controls will be used to minimise the potential for land and water contamination from the handling, storage and disposal of hazardous substances. These controls will include storage within properly sealed containers and controlled areas, and bunding areas used for medium to long-term storage requirements. Storage and waste receival areas will be isolated from clean water catchments to minimise the risk of land or water pollution should an unplanned spill occur.

The response to any accidental spills or ground contamination will be assessed on a case-by-case basis and remediated using biodegradable spill absorbent and in accordance with any requirements of the SDS for the material. Hydrocarbon or chemical spills will be reported in the MPO incident reporting and management system with corrective and preventative measures taken as appropriate, in accordance with the MPO Pollution Incident Response Management Plan.

Hydrocarbon spills will be managed using bioremediation of the contaminated soils within the MPO bioremediation facility located adjacent to the open cut pit or taken offsite for bioremediation at an appropriate facility.

These procedures, in addition to the water quality management measures described above, aim to ensure the site is non-polluting.

MACH Energy will undertake a Land Contamination Assessment following the cessation of mining operations to determine whether potential contamination issues exist on-site and if remediation is required. Any identified contaminated soils will be excavated and disposed of at a licenced facility and the area remediated in accordance with NSW *Contaminated Land Management Act 1997* requirements. The area will then be rehabilitated consistent with the MPO RMP, including revegetation with relevant plant species according to the areas Secondary Domain/post-mining land use.

4.7 PUBLIC SAFETY AND SOCIAL TRANSITION

4.7.1 Mine Closure Planning

As discussed in the Project EIS (MACH Energy, 2021), a Mine Closure Plan will be developed for the Project in consultation with relevant regulatory authorities and community stakeholders. The Mine Closure Plan will be developed over the Project life, with more detailed measures developed closer to Project completion, generally within 5 years of cessation of mining. MACH Energy will undertake consultation with relevant stakeholders (i.e. MSC) as part of the Mine Closure Plan over the life of the mine to the satisfaction of DPHI and/or NSW Resources Regulator.

Upon cessation of mining operations, it would be expected that tenure of the MLs would be maintained by MACH Energy until such time as ML and other statutory approval relinquishment criteria were satisfied. These criteria will be formulated and prescribed in consultation with relevant regulatory authorities and stakeholders. MACH Energy will transfer any documents to the relevant regulators required to preserve the history of the site, once closed, to facilitate future land use planning.

It is anticipated that mine relinquishment criteria will include, but not necessarily be limited to, the following:

- decommissioning and removal of infrastructure, where appropriate and required;
- landform stability and public safety;
- establishment of self-sustaining vegetation in previously cleared areas;
- quality of surface water runoff is comparable to the surrounding environment; and
- fulfilment of ML and other statutory approval conditions.

Lease relinquishment criteria will be detailed in the Mine Closure Plan.

The *Strategic Framework for Mine Closure* published by the ANZMEC & MCA (2000) (or its contemporary version) will be used as a guide for mine closure.

4.7.2 Ongoing Stakeholder Consultation

Key processes to enable all stakeholders to have their interests considered during mine closure process will include, but not necessary be limited to, the following:

- ongoing review and update of the MPO RMP and Rehabilitation Strategy;
- submission of MPO Annual Reviews;
- CCC;
- Media contact point;

- Potential future landowners and person with business interests in post closure land use;
- Community newsletters, MACH Energy website and an email address; and
- One-on-one meetings with stakeholders.

Through ongoing consultation, MACH Energy will present detailed mine closure strategies and provide updates on the performance of rehabilitation with respect to the approved rehabilitation completion criteria.

Towards the end of the mine life, MACH Energy will develop a detailed Mine Closure Plan in consultation with a range of stakeholders, including:

- MSC;
- DPHI; and
- NSW Resources Regulator.

Stakeholder Engagement Plan

Separately, a Stakeholder Engagement Plan to guide rehabilitation and mine closure planning processes and outcomes will be developed in a separate document, in accordance with Part B, Condition B89(l) of Development Consent SSD 10418.

Stakeholder consultation has been undertaken to date to inform potential post-mining land uses, mine landform design and rehabilitation objectives. These will periodically be reviewed in consultation with relevant stakeholders throughout the life of the Project.

A high-level initial stakeholder engagement plan for the remainder of the Project life is provided in Table 9. Consultation will be undertaken commensurate with the stage of the Project.

Table 9
Initial Stakeholder Engagement Plan – Rehabilitation and Mine Closure

Development Phase	Consultation Mechanism	Stakeholders	Description	Responsible
Pre-mining	This Rehabilitation Strategy	• DPHI • NSW Resources Regulator • BCS • MSC	• Preparation of this Rehabilitation Strategy for the Project, consistent with the rehabilitation objectives in Development Consent DA 92/97 (prior to its surrender) and Development Consent SSD 10418. • This Rehabilitation Strategy addresses all aspects of rehabilitation including mine closure, final landform (including final void), post-mining land use/s and water management.	• Environment and Community Manager
	MPO RMP and Annual Rehabilitation Report and Forward Program	• NSW Resource Regulator	• Preparation of an MPO RMP and associated Annual Rehabilitation Report and Forward Program for the Project consistent with the rehabilitation objectives in the Development Consent DA 92/97 (prior to its surrender) and Development Consent SSD 10418.	• Environment and Community Manager
	CCC Meetings	• CCC (including MSC representative)	• MACH Energy will present the key components of the RMP and Annual Rehabilitation Report and Forward Program to the CCC and incorporate feedback to the satisfaction of the NSW Resources Regulator.	• Environment and Community Manager

Table 9 (Continued)
Initial Stakeholder Engagement Plan – Rehabilitation and Mine Closure

Development Phase	Consultation Mechanism	Stakeholders	Description	Responsible
During-mining	MPO RMP and Annual Rehabilitation Report and Forward Program	• NSW Resources Regulator	• Update the MPO RMP and associated Annual Rehabilitation Report and Forward Program (if required) for the Project in consultation with the relevant regulators and to the satisfaction of the NSW Resources Regulator.	• Environment and Community Manager
	CCC Meetings	• CCC (including MSC representatives)	• MACH Energy will continue to hold CCC meetings, including updates on rehabilitation progress, outcomes of any rehabilitation trials and any proposed changes to the MPO RMP and associated Annual Rehabilitation Report and Forward Program.	• Environment and Community Manager
Pre-closure	Mine Closure Plan	• DPHI • NSW Resources Regulator • MSC	• Towards the end of the mine life, MACH will prepare a detailed Mine Closure Plan (expanding on the plan in the MPO RMP) in consultation with relevant stakeholders and to the satisfaction of the DPHI and/or NSW Resources Regulator.	• Environment and Community Manager
	CCC Meeting	• CCC (including MSC representatives)	• MACH Energy will present detailed mine closure strategies and provide updates on the performance of rehabilitation with respect to the approved rehabilitation completion criteria.	• Environment and Community Manager
Post-closure	Closure Committee Meetings	• CCC (including MSC representatives)	• Regular CCC meetings will continue during the post-closure phase for a period of at least five years, with the CCC acting as a Closure Committee. • Relevant regulators will also be invited to attend Closure Committee meetings as required. • Closure Committee meetings will include updates on the progress of rehabilitation in achieving rehabilitation completion criteria and any relinquishment activities.	• Environment and Community Manager

MACH Energy will continue to develop the Stakeholder Engagement Plan which will identify stakeholders for consultation and will outline planned engagement activities, timing, resources and responsibilities. One of the key focus areas for ongoing dialogue with stakeholders will be the progress with the mine closure and rehabilitation planning and implementation process. Prior to the mine closure of the MPO, this Rehabilitation Strategy will be reviewed to achieve an optimal post closure land use to ensure adverse socio-economic effects associated with rehabilitation and mine closure is effectively minimised.

During rehabilitation phase, the MPO will continue to restrict access to the public similar to that mining operations phase. Prior to site relinquishment, a risk assessment will be undertaken to determine if there are any further controls that need to be put in place to ensure public safety. Measures may include large rock placement, landform shaping, fencing, or signage to alert the public to a potential hazard.

A socio-economic study will be commissioned five years prior to expected mine closure, which will evaluate and address the following:

- developing a contemporary baseline of the MPO workforce and community profile;
- identifying potential socio-effects (positive and negative) of the mine closure on the MPO workforce, associated workforce (subcontractors, suppliers) and the broader community;
- in consultation with stakeholders, proposing measures to minimise potential negative effects and maximise potential positive effects of mine closure; and
- developing a draft implementation programme for the measures identified to address social effects.

MACH Energy will also consult with the Australian Communications and Media Authority, MSC, DPHI and relevant public broadcasters from approximately five years before the relinquishment of mining tenements associated with the MPO to resolve suitable post-operation arrangements for the ongoing operation of the Digital Television (DTV) re-transmission facility (if DTV remains a relevant free-to-air technology).

The findings of the socio-economic study may inform the subsequent versions of this Rehabilitation Strategy. For example, consultation undertaken to date with MSC has identified a preference for intensive agricultural/industrial post-mining land uses that provide employment for the local community. This has been taken into consideration in the final landform design and rehabilitation domains with proposed areas nominated for such land uses. If this preference changes over time, this Rehabilitation Strategy will be updated, considering the progress of final landform established and economic factors.

4.7.3 Premature Mine Closure

In the case of premature mine closure, the NSW Resources Regulator ensures the appropriate rehabilitation cost estimate (RCE) for mining authorisations is held, along with the appropriately valued security deposit. MACH Energy are required to submit a RCE whenever a potential change in rehabilitation liability occurs and at other key points throughout the tenure of an authorisation. This ensures that the NSW Resources Regulator have the appropriate security deposit to cover the costs in undertaking rehabilitation in the event of default and to minimise potential liabilities to the state. A list of the relevant mining authorisations is listed in Section 2.

4.8 VISUAL IMPACTS

In accordance with the rehabilitation objectives (Section 3), MACH Energy will minimise visual impacts (where practicable) in relation to the final landform.

Rehabilitation of the site will align with the commitments made in the MPO Visual Impact Management Plan. These include:

- Visual impacts, associated with views from the surrounding landscape will be reduced over time with progressive rehabilitation as the new waste rock emplacement landform design improves medium to long-term outcomes.
- Planting/seeding of tree screens will continue to be implemented to the east of the MPO area along sections of Wybong Road and Kayuga Road.
- Progressive development of the Fines Emplacement Area, which will be located well to the west of the integrated waste rock emplacement landform. This will shield potential views of the area from the north and east.
- Create on-site stockpiles for mulched vegetation and appropriate topsoil storage to maintain viability of soil for rehabilitation works.

The final landform and the rehabilitation are designed to achieve the rehabilitation objectives (Table 2) and produce a stable landform and sustainable vegetation communities that are ecologically and visually consistent with the surrounding area.

4.8.1 Visual Inspection Monitoring

Visual Inspection Monitoring of existing and recently completed rehabilitation areas will continue to be undertaken monthly, as discussed in the MPO RMP.

The Visual Inspection Monitoring form requires notation of:

- erosion presence, including type (e.g. rill, gully, tunnel), dimension and active state of the erosion;
- weed presence, including species, infestation area (square metres), and cover (%) or count;
- groundcover description; and
- comments and photo numbers to provide additional information on the status of the area, and if the area requires remediation measures.

The Visual Inspection Monitoring process allows comparison between different rehabilitation sites and over time, it also allows the identification of areas requiring remediation.

4.9 BIODIVERSITY IMPACTS

MACH Energy currently manages impacts to biodiversity by implementing the following management plans, programs and strategies:

- the MPO Biodiversity Management Plan, which includes the Vegetation Clearance Protocol and a Ground Disturbance Permit system;
- weed and pest control programs;
- an MPO RMP, including rehabilitation monitoring program; and
- the approved EPBC Act Offset Management Plan (required by Commonwealth Approval EPBC 2011/5795).
- the approved EPBC Act Threatened Ecological Community Mine Site Rehabilitation Plan (required under Commonwealth Approval EPBC 2011/5795).

MACH Energy will undertake rehabilitation monitoring in accordance with the MPO RMP. The MPO Biodiversity Management Plan outlines the proposed rehabilitation inspections and monitoring.

Open Woodland Rehabilitation

Where relevant, management practices described in the *National Recovery Plan – White Box – Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Department of Environment, Climate Change and Water, 2011) will continue to be used as the basis for the re-establishment of grassy woodland areas on-site.

Commonwealth Approval EPBC 2011/5795 requires development of a Threatened Ecological Community Mine Site Rehabilitation Plan to guide the re-establishment of Box-Gum Woodland CEEC across the Project area, including rehabilitated mine landforms. The Threatened Ecological Community Mine Site Rehabilitation Plan was approved by the Commonwealth Department of Agriculture, Water and the Environment on 22 October 2020. This plan will be reviewed and updated to incorporate the Project in 2025.

In accordance with the rehabilitation objectives (Section 3), rehabilitation of woodland at the MPO will continue to focus on flora species endemic to the local area, while acknowledging that seed supply may be a limiting factor. In this case, other appropriate native species that have performed well in the region will also be considered. Subject to seed and seedling supply availability and suitability, flora species to be used in rehabilitation will aim to include those typical of the *Box-Gum Woodland CEEC*. The Biodiversity Management Plan discusses the collection and use of locally sourced native seeds and additional biodiversity management measures relating to woodland rehabilitation.

5 REHABILITATION SCHEDULE AND PROGRESSIVE REHABILITATION

Condition 55, Schedule 3 of Development Consent DA 92/97 requires MACH Energy to undertake progressive rehabilitation and to minimise the area of land exposed at any time. Condition 55A, Schedule 3 of Development Consent DA 92/97 requires that MACH Energy implement all reasonable and feasible measures to provide for the interim stabilisation and temporary revegetation of the existing rail loop and infrastructure corridor, as soon as reasonably practicable following its removal. Condition 54 (e), Schedule 3 of Development Consent DA 92/97 requires an indicative schedule for the staged rehabilitation of the MPO.

Section 5.1 describes progressive rehabilitation strategies proposed to be implemented across the site, and Section 7.2 describes the measures that will be implemented to provide interim stabilisation and temporary revegetation of the existing rail loop and infrastructure corridor. Section 5.3 provides an indicative schedule for rehabilitation of the MPO.

5.1 PROGRESSIVE REHABILITATION

MACH Energy will prioritise construction of the lower batters of the waste emplacement to the final landform profile, and the rapid spreading of topsoil and sowing of sterile cover crops to target early revegetation of these batters to progressively minimise visual impacts on Muswellbrook and other locations to the east.

The preferential use of 10 m lifts of the emplacement landform will result in more rapid establishment of the final surface levels. Using this approach, waste rock placement progresses more rapidly than the alternative of construction in 20 m emplacement lifts. Lifts greater than 10 m may however be used on occasion, if the 10 m lifts result in material economic constraints.

The final landform surface designed in accordance with geomorphic design principles is discussed in the Project EIS (MACH Energy, 2021) and was used to develop bench designs for the waste emplacement that minimise the amount of cut and fill by dozers. The bench designs are loaded into dozer GPS software that then guides dozer operators on how much cut and fill is required to achieve the design surface.

Inspection and Test Plan procedures have been established by MACH Energy and are conducted both during the landform design phase and after landform construction to verify the landform has been developed consistent with the design (MACH Energy, 2021). A summary of the landform shaping activities and acceptance criteria included in the Inspection and Test Plan is provided in Table 10.

Table 10
Waste Rock Emplacement Final Surface Shaping Process

Item	Activity	Acceptance Criteria
1	Design Approval	• A Landform Design Inspection and Test Plan has been completed and approved by MACH Energy and the geomorphological design representative, prior to commencing profiling works.
2	Pre-Start	• Operators and supervisors have received all relevant information and training relevant to the Inspection and Test Plan, including landform design surfaces and dozer GPS files.
3	Survey	• Surveyors peg out landform crest, toe boundaries and any other requirements to achieve the approved rehabilitation design.
4	Profiling	• The following records are maintained during profiling: - progressive survey pickups/scans; - progressive photographs; and - progress tracking and reporting (e.g. volume moved, area completed, etc.) • Profiling works have been completed to within required tolerances in accordance with the supplied rehabilitation design. • Final survey confirms compliance to design, or rectification required.
5	Approval	• MACH Energy approves the landform profiling conforms to the geomorphic design and agrees to proceed to the next rehabilitation phase.

To confirm compliance of the as-built emplacement with the geomorphic design surface, Light Detection and Ranging (LiDAR) data of the as-built landform is compared to the design surface to confirm construction variations are within:

- 100 millimetres (mm) on drainage lines; and
- 300 mm elsewhere on the emplacement.

These landform establishment tolerances apply at the time of construction. Over time, the landform may develop outside of these tolerances due to natural processes and differential settlement would also be expected post-construction.

MACH Energy anticipates initial rehabilitation within six months of each subsequent dump panel lift being completed (subject to potential delays associated with localised design constraints or climatic extremes when soil placement and revegetation works may need to be delayed) (MACH Energy, 2021). Initial rehabilitation will include targeting reshaping to final surface level and sowing of sterile cover crops of all outer emplacement batter lifts of the Eastern Out of Pit Emplacement.

Initial rehabilitation may also include hydromulching and seeding (with sterile cover crops) of temporary landforms (e.g. mine access roads and construction areas etc.). Initial rehabilitation will be undertaken across the site to minimise the total area exposed at any time, in accordance with Condition 55, Schedule 3 of Development Consent DA 92/97 (prior to its surrender). Initial rehabilitation will be undertaken within six months of areas being available, where areas prone to dust generation, soil erosion and weed incursion cannot be permanently rehabilitated.

Where necessary, some rehabilitation would be temporary because the seeded or planted vegetation would be re-disturbed by subsequent stages of work (e.g. erosion remediation works, construction of rock armoured drains on the waste rock emplacement, or the removal of infrastructure post-mining). Re-disturbance of rehabilitation for drainage, removal of infrastructure, remediation or adaptive works is likely to occur across Secondary Domains A and B (Figures 14 and 15).

5.2 REHABILITATION OF THE RAIL LOOP AND INFRASTRUCTURE CORRIDOR

Condition 37, Schedule 3 of Development Consent DA 92/97 required MACH Energy to:

> *37. The Applicant must, by no later than 31 October 2022:*
>
> *(a) remove all infrastructure associated with the development within Mining Lease No. 1645 (ML 1645) south of Wybong Road (other than infrastructure which the operator of the Bengalla mine agrees with the Applicant, in writing, can remain in situ);*
>
> *(b) do all things available to transfer or cause the grant of a mining lease over that part of ML 1645 south of Wybong Road to the operator of Bengalla mine or its nominee;*
>
> *(c) transfer the freehold land owned by the Applicant within ML 1645 south of Wybong Road to the operator of Bengalla mine (or its nominee) at rural market value;*
>
> *(d) release any easements for pipeline and rail spur within or in the vicinity of ML 1645 south of Wybong Road which benefit land owned by the Applicant; and*
>
> *(e) demolish the Bengalla Link Road bridge required under condition 38 (a) below and, unless otherwise agreed by the Secretary, reinstate the road reserve to the satisfaction of Council.*
>
> *Note: The rail loop and infrastructure corridor is shown in Figure 3 of Appendix 2.*

Following removal of the existing rail loop and associated infrastructure within the footprint of the Bengalla Mine, initial rehabilitation was undertaken so the area did not pose an ongoing material source of dust emissions.

Initial rehabilitation included levelling/reforming the infrastructure area, followed by application of a dust suppressant and sowing of a sterile cover crop vegetation and/or native grasses. The MPO rail spur erosion and sediment control water management structures (e.g. sediment fences) within the footprint of Bengalla Mine was left in place, subject to the agreement of Bengalla Mine.

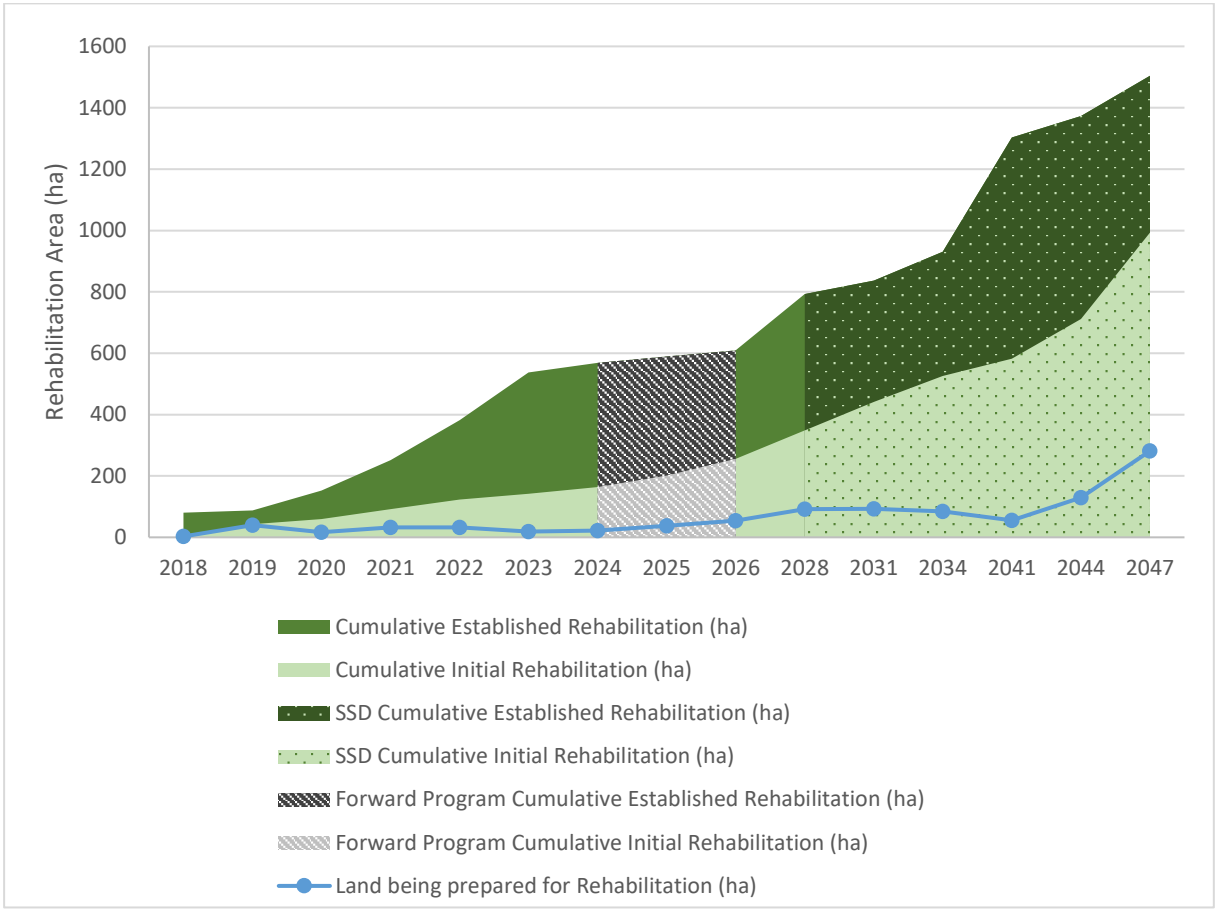
As required by Condition 37, Schedule 3 of Development Consent DA 92/97, the above decommissioning and interim rehabilitation works was completed by 31 October 2022. ML 1645 south of Wybong Road was partially transferred to Bengalla Mine on 23 December 2020.

5.3 REHABILITATION PROGRESS

Chart 1 provides the progress of both initial, established and planned rehabilitation at the MPO, as reported in the MPO Annual Review and detailed in the Annual Rehabilitation Report and Forward Program.

Chart 1 indicates that the progress of initial and established rehabilitation is highly subject to the planned progress of mining activities and the relative waste rock volumes generated. The area of rehabilitation achieved will initially be lower, followed by a period of rapid establishment of larger areas of rehabilitation once significant portions of the out of pit emplacement external batters are available at final surface level. As the MPO progresses, the rate of rehabilitation establishment will stabilise as a more steady state is achieved and mining advances at full scale behind the established South Pit Eastern Out of Pit Emplacement.

Chart 1
Preliminary Estimate of Rehabilitation Progress



Note: Timing subject to confirmation of mining rate and emplacement geometry as detailed in the MPO's Annual Rehabilitation Report and Forward Program and may vary due to factors outside of MACH Energy's control (e.g. climatic extremes).

The MPO RMP and associated Annual Rehabilitation Report and Forward Program (and future versions of the MPO RMP) details the rehabilitation concepts and activities that will be implemented over the MPO mine life to achieve the MPO's rehabilitation goals and completion criteria.

Consistent with the *Form and Way – Rehabilitation Management Plan for Large Mines* (February 2024), to track rehabilitation progress, MACH Energy will prepare an Annual Rehabilitation Report and Forward Program associated with the MPO RMP. This will provide quantitative values of the total disturbance area and total rehabilitation area at the start and at the end of each preceding calendar year and values forecast over the next three years. The Annual Rehabilitation Report and Forward Program also includes supporting plans showing the progression of rehabilitation over the calendar year.

6 POST-MINING LAND USE STRATEGY

MACH Energy has considered potential post-mining land uses (e.g. nature conservation and agriculture) taking into account relevant strategic land use objectives of the area in the vicinity of the Project and the potential benefits of the post-mining land use of the environment, future landholders and the community. This has included consultation with MSC which indicated a preference for the inclusion of some intensive agricultural/industrial post-mining land uses that provide employment for the local community.

The development of conceptual post-mining land uses for the Project EIS considered the *Hunter Regional Plan 2036* (NSW Government, 2016), the *Community Strategic Plan 2017-2027* (MSC, 2017) and the draft *Muswellbrook Local Strategic Planning Statement 2020-2040* (MSC, 2020). The land uses selected align with regional and local strategic land use planning objectives and outcomes in these documents, support a sustainable future for the local community, utilise existing mining infrastructure, and avoid disturbing self-sustaining native ecosystems, where practicable.

MACH Energy has identified parts of the Project final landform that would potentially be conducive to high-intensity agricultural use (e.g. existing mine infrastructure areas) (Figure 15). These areas will be rehabilitated to pasture using appropriate grass species. These areas are characterised by:

- Low gradient slopes and flat areas.
- Proximity to existing land used for agricultural purposes.
- Access to MPO supporting infrastructure that could potentially remain in place to support intensive agricultural use (e.g. rail loop, water storages, high capacity water pumps and pipelines, electrical infrastructure, sheds and offices and other services).

The conceptual post-mining land uses of the Project will continue to comprise a combination of nature conservation (woodland), agricultural (pasture) and grassland land uses. Disturbance is approached in a progressive nature, and disturbance of self-sustaining native ecosystems is avoided, where practicable, in rehabilitation activities (noting that re-disturbance by subsequent stages of work is occasionally required as described in Section 5.1).

MACH Energy will decommission and remove all Project infrastructure unless a suitable post-mining use is identified for the infrastructure in consultation with the NSW Resources Regulator and MSC.

Disturbance of self-sustaining ecosystems by post-mining land uses will be limited by restricting intense agricultural activities to the areas established for this purpose.

In addition to beneficial biodiversity conservation outcomes, the proposed native woodland and grassland areas associated with the mine landforms could provide regional tourism opportunities associated with proximity to native wildlife (e.g. bird watching) and/or active uses of the Project final landform, including activities that could make use of the rehabilitated Eastern Out-of-Pit Emplacement (e.g. walking or mountain biking trails). The design and assessment process for any future land uses will consider the requirement to avoid disturbing self-sustaining native ecosystems, where practicable.

Over the life of the Project, and in particular during the mine closure planning phase (Section 4.7.1), MACH will continue to consider potential alternative and feasible beneficial uses of the final void, including:

- Opportunities for renewable energy projects (e.g. floating solar facility and/or pumped hydro), including consideration of advancements in renewable energy technology that may occur over the life of the Project.
- The potential application of evaporative controls to maintain water quality suitable for productive use and/or to provide a significant off-river storage of supplementary water flows in the Hunter River.

- Waste disposal, taking advantage of the final void sink to avoid the migration of any related contaminants off-site.

These potential final void beneficial uses, if proposed, will be subject to separate assessments and approval, and do not form part of the Project (MACH Energy, 2021). It is noted that the application of evaporative controls in combination with fresh water inputs from runoff or Hunter River extraction may facilitate long-term beneficial use outcomes and minimise evapo-concentration of salts.

Over the life of the Project, MACH Energy will also consult with the *Practical Guide – Post-Mining Land Use* (the Practical Guide) released by the Department of Regional NSW, which sets out the commitment to seek opportunities for post mining land use as representing a significant opportunity for NSW to harness the existing infrastructure, skilled workforce and transport links from mines approaching closure, to continue economic activity on mined land (Department of Regional NSW, 2023).

7 REVIEW AND IMPROVEMENT OF ENVIRONMENTAL PERFORMANCE

7.1 MPO ANNUAL REVIEW

In accordance with Condition 3, Schedule 5 of Development Consent DA 92/97 (prior to its surrender) and Part D, Condition D11 of Development Consent SSD 10418, MACH Energy will prepare an Annual Review report by the end of March each year which reviews and evaluates the environmental performance of the MPO for the preceding calendar year, or other such timing as agreed by the Secretary of the DPIE (now DPHI).

In relation to rehabilitation, the MPO Annual Review will:

- describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;
- include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:
  - relevant statutory requirements, limits or performance measures/criteria;
  - requirements of any plan or program under this consent;
  - monitoring results of previous years; and
  - relevant predictions in the document/s listed in Part A, Condition A2(c) of Development Consent SSD 10418;
- a summary of rehabilitation monitoring undertaken in accordance with the MPO RMP in the past year;
- identify any rehabilitation activities undertaken over the past year;
- identify any rehabilitation related non-compliance over the past year, and describe what actions were (or are being) taken to ensure compliance; and
- describe what rehabilitation activities will be implemented over the next year to improve the environmental performance of the MPO.

The MPO Annual Review will be made publicly available on the MACH Energy website in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97 (prior to its surrender) and Part D, Condition D17 of Development Consent SSD 10418.

Copies of the MPO Annual Review will be submitted to MSC and made available to the Community Consultative Committee and any interested person upon request, in accordance with Part D, Condition D12 of Development Consent SSD 10418 and Condition 11, Schedule 5 of Development Consent DA 92/97 (prior to its surrender). The MPO Annual Review will also be made publicly available on the MACH Energy website (https://machenergyaustralia.com.au/).

7.2 REHABILITATION STRATEGY REVISION

Development Consent DA 92/97

In accordance with Condition 4, Schedule 5 of Development Consent DA 92/97 (prior to its surrender), this Rehabilitation Strategy will be reviewed, and if necessary revised (to the satisfaction of the Secretary of the DPIE [now DPHI]), within three months of the submission of:

- an MPO Annual Review (Condition 3, Schedule 5 of Development Consent DA 92/97);
- an Incident Report (Condition 7, Schedule 5 of Development Consent DA 92/97);
- an Independent Environmental Audit (IEA) (Condition 9, Schedule 5 of Development Consent DA 92/97); and
- any modification to the conditions of Development Consent DA 92/97.

Within four weeks of conducting any such revision, MACH Energy will advise the Secretary of the DPIE (now DPHI) of the outcomes of the review, and submit any revised documents to the Secretary of the DPIE (now DPHI) for approval.

In accordance with Condition 4A, Schedule 5 of Development Consent DA 92/97, MACH Energy may submit a revised Rehabilitation Strategy for the approval of the Secretary at any time, and may also submit any revision to this Rehabilitation Strategy required under Development Consent DA 92/97 on a staged basis.

If agreed with the Secretary of the DPIE (now DPHI), a revision to this Rehabilitation Strategy required under Development Consent DA 92/97 may be prepared without undertaking consultation with all parties nominated under the relevant Condition of Development Consent DA 92/97.

This Rehabilitation Strategy will be made publicly available on the MACH Energy website, in accordance with Condition 11, Schedule 5 of Development Consent DA 92/97.

Development Consent SSD 10418

In accordance with Part D, Condition D7 of Development Consent SSD 10418, this Rehabilitation Strategy will be reviewed, and if necessary revised (to the satisfaction of the Planning Secretary), within three months of the submission of:

- an incident report (Part D, Condition D9 or D10 of Development Consent SSD 10418);
- an MPO Annual Review (Part D, Condition D11 of Development Consent SSD 10418);
- an IEA (Part D, Condition D13 of Development Consent SSD 10418);
- any modification to the conditions of Development Consent SSD 10418; and
- a notification of a change in development phase under Part A, Condition A12 of Development Consent SSD 10418.

In accordance with Part D, Condition D8 of Development Consent SSD 10418, within six weeks of conducting any review, MACH Energy will advise the Planning Secretary of the DPE (now DPHI) of the outcomes of the review and submit any revised documents submitted to the Planning Secretary for approval.

In accordance Part A, Condition A24 of Development Consent SSD 10418, MACH Energy may submit a revised Rehabilitation Strategy for the approval of the Planning Secretary at any time and may also submit any revision to this Rehabilitation Strategy on a staged basis.

In accordance with Part A, Condition A25 of Development Consent SSD 10418, if agreed with the Planning Secretary, a revision to this Rehabilitation Strategy required under Development Consent SSD 10418 may be prepared without undertaking consultation with all parties nominated under the relevant conditions of Development Consent SSD 10418.

Additionally, in accordance with Part B, Condition B89(n) of Development Consent SSD 10418, MACH Energy will periodically review and update the Rehabilitation Strategy at least every three years.

7.3 INDEPENDENT ENVIRONMENTAL AUDIT

Within one year of commencement of development under Development Consent SSD 10418, and every three years after, an IEA will be undertaken and submitted as required, in accordance with Part D, Condition D13 of Development Consent SSD 10418.

In accordance with Part D, Condition D14 of Development Consent SSD 10418, within three months of commencing the IEA, MACH Energy will submit a copy of the audit report to the Planning Secretary, and other NSW agency that requests it, together with its response to any recommendations contained in the audit report, and a timetable for the implementation of the recommendations. MACH Energy will ensure that the recommendations will be implemented and the findings and compliance with the IEA will be reported in the MPO Annual Reviews.

Once Development Consent DA 92/97 is surrendered, all subsequent IEAs commissioned by MACH Energy will be in accordance with Part D, Condition D13 and D14 of Development Consent SSD 10418.

Subsequent versions of the IEA will be provided to the Planning Secretary of the DPE (now DPHI) and made available on the MACH Energy website. The IEA will be conducted by a suitably qualified, experienced and independent team of experts whose appointment has been endorsed by the Planning Secretary of the DPE (now DPHI).

8 REPORTING PROCEDURES

In accordance with Part D, Condition D5(h) of Development Consent SSD 10418 and Schedule 5, Condition 2 of Development Consent DA 92/97 (prior to its surrender), MACH Energy has developed protocols for managing and reporting the following:

- incidents;
- complaints;
- non-compliances with statutory requirements; and
- exceedances of the impact assessment criteria and/or performance criteria.

These protocols are described in detail in the MPO EMS.

In accordance with Part D, Condition D17(vi) of Development Consent SSD 10418 and Schedule 5, Condition 8 of Development Consent DA 92/97 (prior to its surrender), MACH Energy will provide regular reporting on the environmental performance of the MPO on the MACH Energy website (https://machenergyaustralia.com.au/).

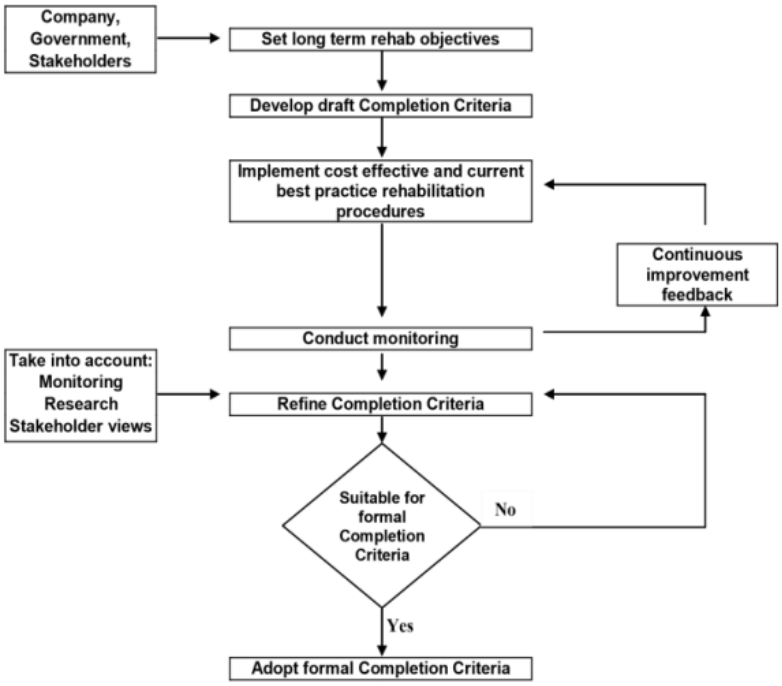
In accordance with Part D, Conditions D15 and D16 of Development Consent SSD 10418, any conditions of Development Consent SSD 10418 that require the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the NSW EP&A Act. These conditions include incident notification (Part D, Condition D9 of Development Consent SSD 10418); non-compliance notification (Part D, Condition D10 of Development Consent SSD 10418); reporting and response; compliance reporting; and IEA (Part D, Condition D13 of Development Consent SSD 10418).

9 REHABILITATION MONITORING AND RESEARCH

9.1 REVIEW AND REFINEMENT

Rehabilitation is an iterative process which incorporates refinement/improvement of methods throughout the lifetime of the mine. Monitoring of rehabilitation allows for application of adaptive management to be applied in subsequent and later years. It will also assist with continuous improvement in the site's performance in terms of landscape and land use. An example of an iterative, continual improvement approach to mine site rehabilitation which may be implemented is shown in Figure 21 (based on Nichols, 2005).

Figure 21
Continuous Improvement including Monitoring and Review Processes



Detail on the mining plan and progress, as well as topsoil management and target vegetation species and communities is provided in the MPO RMP for the mine as it is developed and associated reporting on an annual basis. The ongoing refinement and improvement of the final landform and final void will be subject to rehabilitation monitoring reports which are prepared annually and include:

- Ecosystem monitoring (Section 9.2.2);
- Rehabilitation Verification Inspections (Section 9.2.3);
- Surface monitoring using LiDAR and photo points;
- Visual Inspection Monitoring (Section 4.8.1); and
- Low intensity agriculture monitoring programme (Section 9.2.5).

Information obtained from the above monitoring and reporting will be considered in future revisions of this Rehabilitation Strategy.

Rehabilitation monitoring sites will be established progressively as mining and waste emplacement areas are rehabilitated. Monitoring sites will be documented progressively in the MPO RMP and associated Annual Rehabilitation Report and Forward Program, which has replaced the MOP.

The monitoring methodology used for the annual ecological rehabilitation monitoring is documented in the Rehabilitation Monitoring Manual (RMM). The RMM has been prepared to guide rehabilitation monitoring at the MPO so that the monitoring program can be consistently replicated year to year and produces statistically robust and consistent data. Details of rehabilitation performance will be reported in the MPO Annual Review**.**

Monitoring of rehabilitation areas at the MPO is described in detail in the MPO RMP and associated Annual Rehabilitation Report and Forward Program (and will continue to be described in future versions of the MPO RMP). Rehabilitation monitoring will utilise the principles of a systems-based approach (e.g. Landscape Function Analysis [Tongway and Ludwig, 2011] or similar) to determine progress towards a self-sustaining ecosystem and compare the conditions of the rehabilitated areas with representative control sites. In the areas designated for native revegetation (Figures 15 and 16), Landscape Function Analysis will be supplemented with floristic monitoring and compared to vegetation benchmark completion criteria for the targeted PCTs.

Detailed performance indicators and completion criteria have been developed to assess rehabilitation success at the MPO and are provided in the MPO RMP (and will continue to be provided in future versions of the MPO RMP). The performance indicators and completion criteria set in the MPO RMP[8] are developed in consideration of the MPO's overarching rehabilitation objectives (Section 3); the six principles of the *National standards for the practice of ecological restoration in Australia* (Society for Ecological Restoration Australasia [SERA], 2018) and include quantitative benchmark values for the relevant PCTs to be established in MPO rehabilitation areas. The benchmark values have been included in the absence of data from analogue/reference sites which are representative of the MPO rehabilitation areas. Once a data set, collected over a number of monitoring campaigns, from the relevant reference sites has been obtained, the benchmark values will be revised to reflect the local reference site data. The rehabilitation performance indicators and completion criteria included in the MPO RMP prepared in accordance with the NSW *Mining Amendment (Standard Conditions of Mining Leases) – Rehabilitation Regulation 2021*, will be prepared in consideration of the NSW Resources Regulator's relevant guidelines.

Monitoring will inform the need for corrective actions/contingency measures, as described in the MPO RMP and associated Annual Rehabilitation Report and Forward Program (and in future versions of the MPO RMP). The MPO RMP includes a Trigger Action Response Plan which includes a description of the contingency measures that would be undertaken should rehabilitation monitoring indicate that a rehabilitation area is not trending towards its relevant completion criteria, and measures that would be undertaken in response to the occurrence of risk event. The status of rehabilitation may be evaluated using recognised frameworks such as the 'Progress Evaluation Recovery Wheel' (SERA, 2018). A Trigger Action Response Plan will continue to be included in future versions of the MPO RMP.

The rehabilitation program at the MPO aims to incorporate management practices that have resulted from industry research into the establishment of woodland and grassland communities across mined landscapes, and in particular in the Hunter Valley region. The outcomes of the rehabilitation trials will be used to refine the rehabilitation program at the MPO.

[8] MACH Energy is in the process of updating the MPO RMP to align with both Development Consent DA 92/97 (prior to its surrender) and Development Consent SSD 10418.

As part of the rehabilitation program, MACH Energy will undertake research trials at the MPO as described in the MPO RMP and associated Annual Rehabilitation Report and Forward Program (and in future versions of the MPO RMP). These research trials will focus on research and management practices which are designed to enhance the woodland communities established across the rehabilitated landscape. MACH Energy proposes to build on industry research results to re-establish woodland in rehabilitated areas. MACH Energy will also conduct investigations (including soil testwork) to assess the characteristics of replaced soil and assess its suitability for rehabilitation of Class 3, 4, 5 and 6 Land Capability agricultural lands, as determined by a Certified Professional Soil Scientist. The outcomes of the rehabilitation trials will be used to refine the rehabilitation program at the MPO. Refinements to the MPO rehabilitation program will be described in revised versions of the MPO RMP which will be provided for relevant regulatory agencies and other key stakeholders for comment and subject to approval by the DPIE (now DPHI).

9.2 REHABILITATION MONITORING PROGRAM

As discussed in the MPO RMP and associated Annual Rehabilitation Report and Forward Program, MACH Energy has collaborated with Umwelt Environmental Consultants to develop a RMM for the MPO. The RMM has been prepared to guide rehabilitation monitoring at the MPO so that the monitoring program can be consistently replicated year to year and produce statistically robust and consistent data. The RMM describes MPO rehabilitation objectives, performance indicators and completion criteria for the progressive rehabilitation phases, and the rehabilitation monitoring methodologies and monitoring parameters.

A rehabilitation monitoring program has been implemented at MPO based on the performance indicators and completion criteria. The monitoring program described in the MPO RMP is the responsibility of the Environmental Superintendent. Details of rehabilitation performance will be reported in the Annual Review and updated in this report.

Where necessary, rehabilitation procedures will be amended based on the monitoring results, to continually improve rehabilitation standards.

9.2.1 Rehabilitation Quality Assurance Process

The overarching rehabilitation objectives including final land use for the MPO are formalised in Table 11, Condition 53, Schedule 3 of the Development Consent DA 92/97 (prior to its surrender) and Part B, Condition B87 of Development Consent SSD 10418. The final land use is comprised of the following:

- Agricultural - Grazing comprising of both low and high intensity agricultural areas.
- Native Ecosystem, generally comprising:
  - PCT 3395[9] – White Box – Spotted Gum Grassy Woodland and DNG;
  - PCT 3315[10] – Spotted Gum – Narrow-leaved Ironbark Woodland; and
  - PCT 3431[11] – Narrow-leaved Ironbark Shrubby Forest Woodland and DNG.
- Water Storage (Excluding Final Void)[12].
- Final Void.

Section 7 of the MPO RMP details the Rehabilitation Quality Assurance Process which outlines the rehabilitation, key actions and/or processes nominated for each phase throughout the life of the operations to ensure that:

- Rehabilitation is implemented in accordance with the nominated methodologies.
- Identified risks to rehabilitation are adequately addressed before proceeding to the next phase of rehabilitation.

The Rehabilitation Quality Assurance Process will be integrated into day-to-day operations at the MPO and implemented throughout the life of the operation, including into closure in order to meet the final land use objectives for the MPO. The Rehabilitation Quality Assurance Process is outlined in Table 11. Rehabilitation validation monitoring is undertaken as described in the MPO RMP.

[9] Previously referred to as PCT 483.

[10] Previously referred to as PCT 1604.

[11] Previously referred to as PCT 1605.

[12] The Final Land Use Domain of 'Water Storage (Excluding Final Void)' is not present in the final land use domains in Development Consent SSD 10418.

Table 11
Rehabilitation Quality Assurance Process

Rehabilitation Phase	Quality Assurance Process	Responsibilities for Implementation	Documentation / Recording Process	Review Process and Timeframes
Active Mining	ITPs for each stage of rehabilitation Mine planning, both 5 year plan and LOM plan Weed and pest management programs Erosion and sediment control programs and inspections Monthly inspections Survey control	Technical Services Manager Environment Manager	ITPs Monthly inspections Annual Rehabilitation Report and Forward Program Topsoil inventory Quarterly weed management reports	Annually and/or following an incident
Decommissioning	Inspections and demolition reporting processes Contaminated land assessments	Technical Services Manager Environment Manager	Monthly waste reports Decommissioning reports As-constructed final landform plan	Annually and/or following an incident
Landform Establishment	ITPs for each stage of rehabilitation Mine planning, both 5 year plan and LOM plan Erosion and sediment control programs and inspections Monthly inspections Survey control	Technical Services Manager Environment Manager	ITPs Annual rehabilitation monitoring Monthly inspections	Annually and/or following an incident
Growth Media Development	ITPs for each stage of rehabilitation Topsoil inventory and management plan processes Weed and pest management programs Erosion and sediment control programs and inspections Monthly inspections Survey control	Environment Manager	ITPs Annual rehabilitation monitoring Monthly inspections Topsoil inventory Quarterly weed management reports	Annually and/or following an incident

Table 11 (Continued)
Rehabilitation Quality Assurance Process

Rehabilitation Phase	Quality Assurance Process	Responsibilities for Implementation	Documentation / Recording Process	Review Process and Timeframes
Ecosystem and Land Use Establishment	ITPs for each stage of rehabilitation Topsoil inventory and management plan processes Weed and pest management programs Erosion and sediment control programs and inspections Monthly inspections	Environment Manager	ITPs Annual rehabilitation monitoring Monthly inspections Quarterly weed management reports	Annually and/or following an incident
Ecosystem and Land Use Development	ITPs for each stage of rehabilitation Topsoil inventory and management plan processes Weed and pest management programs Erosion and sediment control programs and inspections Monthly inspections	Environment Manager	ITPs Annual rehabilitation monitoring Monthly inspections Quarterly weed management reports	Annually and/or following an incident

Note:
ITP = Inspection Test Plan.
LOM = Life of Mine.

ITP checks are quality assurance checks which are undertaken to ensure the rehabilitation specifications have been met. MACH Energy implements ITPs for Landform Design, Landform Construction Profiling, Topsoil Placement, Drainage Construction and Ripping and Seeding. Each ITP is required to be signed off by relevant MACH Energy personnel.

9.2.2 Rehabilitation Research, Modelling and Trials

As discussed in the MPO RMP, over the MPO life of mine, MACH Energy proposes to build on industry research results and conduct various research studies and trials to inform the most suitable practices that will enable the re-establishment of woodland and grassland areas on final mine landforms and disturbed areas of the MPO. Details of the research may include:

- Potential variables impacting on rehabilitation programs and causes of localised rehabilitation failure.
- Assessing rehabilitation strategies that have successfully reinstated woodland communities (or rehabilitation with species typical of various communities) on other mine sites, including:
    - establishing appropriate soil substrate: direct application of topsoil; stockpiled native topsoil; raw overburden and interburden material plus addition of biosolids/organic growth medium; addition of other organic material; rehabilitation trials on fines material;
    - establishment of the grassy understorey: grass species suitable for mine rehabilitation; low and high photosynthetic pathway species; establishing native herbs and forbs;

  - establishing the shrubby understorey and overstorey;
  - seed distribution methods: hand-broadcasting; brush-matting; hydro-mulching; spreading seed-bearing hay; direct seeding; air seeding; and
  - progressive rehabilitation strategy: pre-stripping requirements; sequence of rehabilitation strategies.
- Rehabilitation irrigation trials, subject to weather conditions and water availability for the trial.
- Tiger Orchid (*Cymbidium canaliculatum*) propagation trial. MACH Energy currently conducts a Tiger Orchid translocation program, in collaboration with an ecologist, for the translocation of Tiger Orchids identified during MPO Vegetation Clearance Protocol works. The trial will involve excising parts of existing Tiger Orchids for propagation in a nursery. If successful, MACH Energy proposes to replace the propagated Tiger Orchids within MPO rehabilitation areas.

The review of the target vegetation communities proposed in rehabilitated woodland areas, grassland areas and fauna habitat and if they are being achieved at the MPO will be assessed using the Rehabilitation Quality Assurance Process (Table 11) and reviewed in 2025.

ACARP Tailings to Topsoil Research Project

MACH Energy has also entered into a collaboration agreement with the University of Newcastle on the ACARP Project “Tailings to topsoil” (#C29042) which commenced in January 2020 and is still ongoing. The outcomes of this study may also lead to some variation to final land use objectives, or rehabilitation techniques for the Fines Emplacement Area. The progress and outcomes of this study have been and will continue to be reported in the MPO Annual Review.

Rehabilitated Landform Erosion Monitoring

MACH has entered into an agreement with University of Newcastle to establish a field data collection program to support landform design and rehabilitation practices at the MPO over the life of the Project.

Rehabilitation monitoring sites will be established in representative rehabilitation and analogue locations. Each monitoring site will consist of a flume to measure surface water runoff and soil erosion rate and a weather station that records rainfall (pluviograph), air temperature, incoming and outgoing radiation as well as soil moisture. This allows both surface and subsurface hydrology to be quantified. Deeper soil moisture and temperature probes may be added depending on the depth of the soil material. Data from each monitoring site will be used to quantify and understand:

- Plot hydrology, water quality and sediment transport both for individual rainfall events as well as performance over the life of the Project.
- Vegetation response.
- Calibrate and validate the SIBERIA landscape evolution model.
- Potential completion criteria for long-term erosional stability.

Data from the rehabilitation monitoring sites will be reviewed on an annual basis and used to inform future rehabilitation monitoring and adaptive management of the geomorphic landform design. Information will also be made available to the community via presentations to the CCC, conference presentations and/or periodic research papers jointly published by MACH Energy and the University of Newcastle.

Topsoil Stockpile Investigation

Between 2020 and 2022, MACH Energy engaged the University of Newcastle to design and undertake a topsoil stockpile research trial to assess the effectiveness of the MPO’s ‘Soil Stockpile Management’ practices and the ‘Soil Replacement on Rehabilitation Areas’ practices as outlined in the MPO RMP.

The trial involved comparison of microbes and soil at one 5 m high trial topsoil stockpile and at six other 3 m high control topsoil stockpiles. The study is now complete, and the preliminary results indicate no quantifiable difference between the five-metre trial site and the three-metre stockpiles (University of Newcastle, 2021). The majority of soil properties (both chemical and physical) have no correlation with stockpile depth across all sample sites. Exchangeable nutrient and micronutrients were found to vary greatly across the site. Total carbon was significantly lower at the 5 m trial stockpile at Pit E. No correlations between total carbon and depth were observed across the site however, this may be more a function of a pre-stripped soil heath than a result of greater stockpile depths. Soil microbial biomass was shown to have a significant linear decrease with increasing stockpile depth at four of the six stockpiles. As vegetation is re-established and the soil ecosystem continues to develop it is expected that soil quality will improve across both control and trial sites.

The outcomes of the rehabilitation trials will be used to refine the rehabilitation program for the Project.

9.2.3 Rehabilitation Verification Inspection

In addition to ecological monitoring (Section 4.9), MACH Energy will continue to implement an annual Rehabilitation Verification and Inspection to evaluate how successful rehabilitation works have been. The scope of the inspection is to include all existing and recently completed areas on-site. Post-closure, monitoring may be undertaken at an alternative frequency if a suitably qualified and experienced person considers that annual monitoring is not warranted due to the advanced/mature condition of rehabilitation.

As part of the monitoring program for rehabilitation, Rehabilitation Verification and Inspection Checklists have been developed relevant to whether a rehabilitation area is in the Growth Media Development phase (i.e. Phase 3), or in either the Ecosystem and Land Use Development or Sustainability phase (i.e. Phases 4 or 5). The checklist forms include the Phase 3, 4 and 5 rehabilitation criteria (Section 4.2.2), and determination of whether the area is Not Compliant, Not Yet Compliant, Near Compliant or Compliant with the criteria.

The Rehabilitation Verification and Inspection Checklist form also requires evidence of, or a description of justification for, the level of compliance rating and notation of the level of corrective actions required to improve the compliance level (e.g. if the area requires rework, or rectifying measures, or to continue existing maintenance and monitoring measures).

The Rehabilitation Verification and Inspection information is then combined with the annual ecological monitoring results, to provide a comprehensive description of the progress of rehabilitation against the relevant completion criteria within the annual rehabilitation monitoring report.

9.2.4 Ecosystem Monitoring

The objective of this component of the ecosystem monitoring program is to evaluate the progress of rehabilitation towards fulfilling long-term land use objectives and completion criteria. An Ecosystem Function Analysis data collection form is included in the ecosystem monitoring program to ensure accurate data collection. Monitoring of rehabilitation areas will be undertaken annually[13], in accordance with the MPO RMP, to:

- compare monitoring results against rehabilitation objectives, performance indicators and completion criteria;
- identify possible trends and areas for improvement;
- link to records of rehabilitation to determine causes and explain results;
- assess effectiveness of environmental controls implemented;

[13] Post-closure, monitoring may be undertaken at an alternative frequency if a suitably qualified and experienced person considers that annual monitoring is not warranted due to the advanced/mature condition of the rehabilitation.

- where necessary, identify modifications required for the monitoring program, rehabilitation practices or areas requiring research;
- compare flora species present against original seed mix and/or reference sites;
- assess vegetation health;
- assess vegetation structure (density of upper, mid and lower storey); and
- where applicable, assess native fauna species diversity and the effectiveness of habitat creation for target fauna species.

Where necessary, rehabilitation procedures will be amended based on rehabilitation monitoring results to continually improve rehabilitation standards, or as more data becomes available regarding reference sites or the targeted vegetation community, completion criteria can be updated to ensure rehabilitation is improving on the right trajectory.

The methodology used to undertake the ecosystem monitoring is captured in detail in the MPO RMP and the RMM.

9.2.5 Low Intensity Agricultural Land Monitoring

Monitoring of areas proposed for agricultural end land uses (i.e. grazing) will include a range of parameters including soil, water supply and pasture parameters and may include livestock parameters (when adequately advanced).

Parameters that will be monitored in Project agricultural rehabilitation areas (Figure 15) include:

- **Soil:** pH, phosphorus, nitrogen, sulphur, potassium, calcium, electrical conductivity/salinity, Sodicity, Cation Exchange Capacity, Organic Carbon, and some trace elements (e.g. copper) on advice from Agronomist.
- **Water Supply:** pH, EC/Salinity, and potentially toxic elements on advice from Agronomist (e.g. iron, magnesium and nitrates).
- **Pasture:** Dry matter yield, pasture quality (e.g. Protein, Digestibility, Metabolisable Energy), ground cover, species composition and Landscape Function Analysis indices.
- **Livestock** (when adequately advanced): Weight, health (i.e. blood testing).

The methodology used to undertake low intensity agricultural land monitoring is captured in detail in the MPO RMP.

10 REFERENCES

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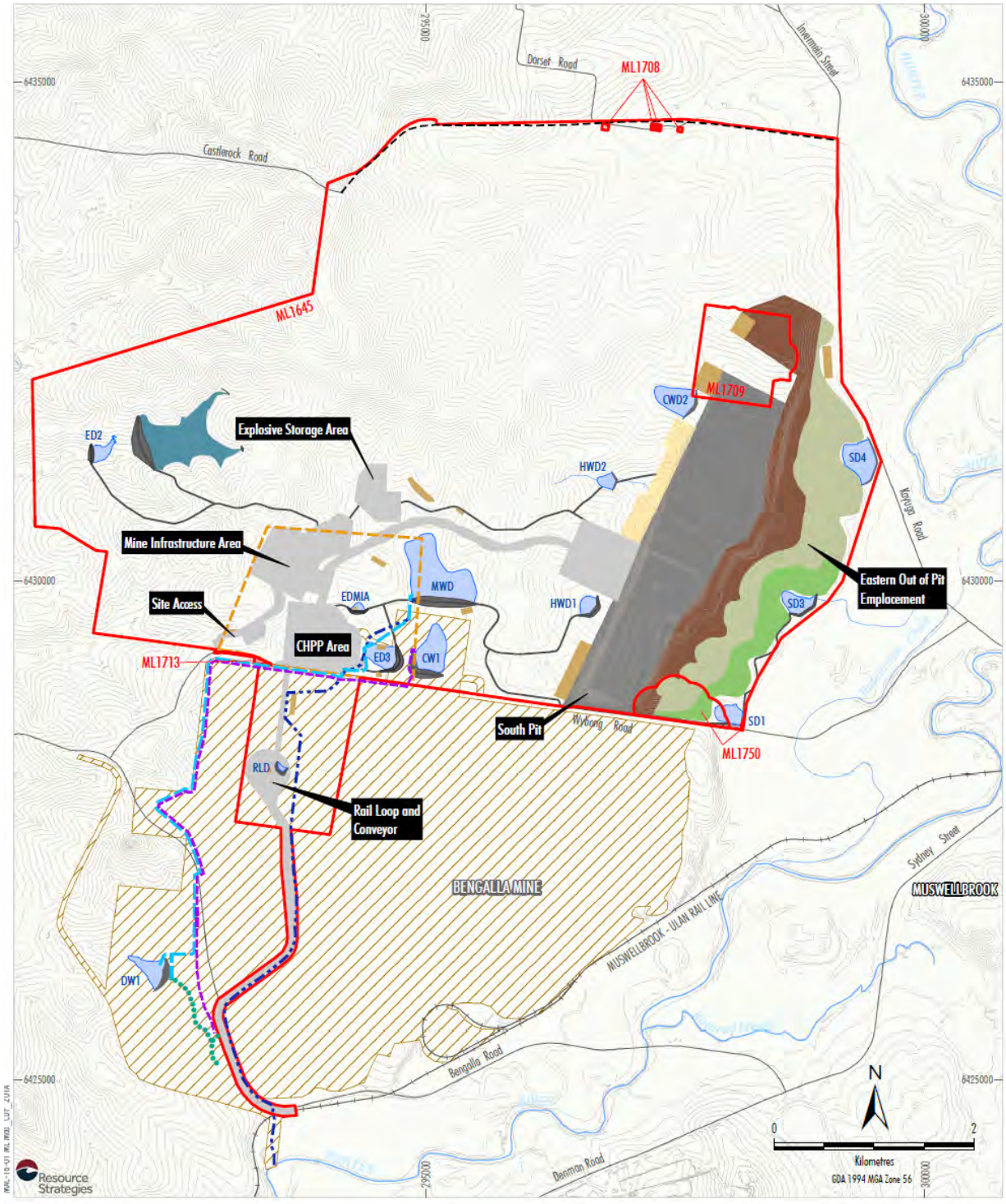
ATTACHMENT 1

APPENDIX 2 OF DEVELOPMENT CONSENT DA 92/97

APPENDIX 2
FIGURE 1 - CONCEPTUAL PROJECT LAYOUT PLAN AT 2021



LEGEND

- Mining Lease Boundary
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)
- Infrastructure Area Envelope
- Active Stripping Area
- Active Mining Area
- Active Overburden Emplacement Area
- Topsoil Stockpile
- Initial Rehabilitation
- Established Rehabilitation
- Infrastructure and Borrow/Stockpile Area
- Access Road
- Northern Link Road

Indicative Water Pipeline Alignment

- MPO Hunter River Supply Pipeline
- MPO DW1 Pipeline (Bi-directional)
- Bengalla Mine CW1 Pipeline
- Approximate Extent of Scour Protection
- Water Dam
- Fines Emplacement Area

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); MACH Energy (2017)

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MOUNT PLEASANT OPERATION

FIGURE 2 - CONCEPTUAL PROJECT LAYOUT PLAN AT 2025

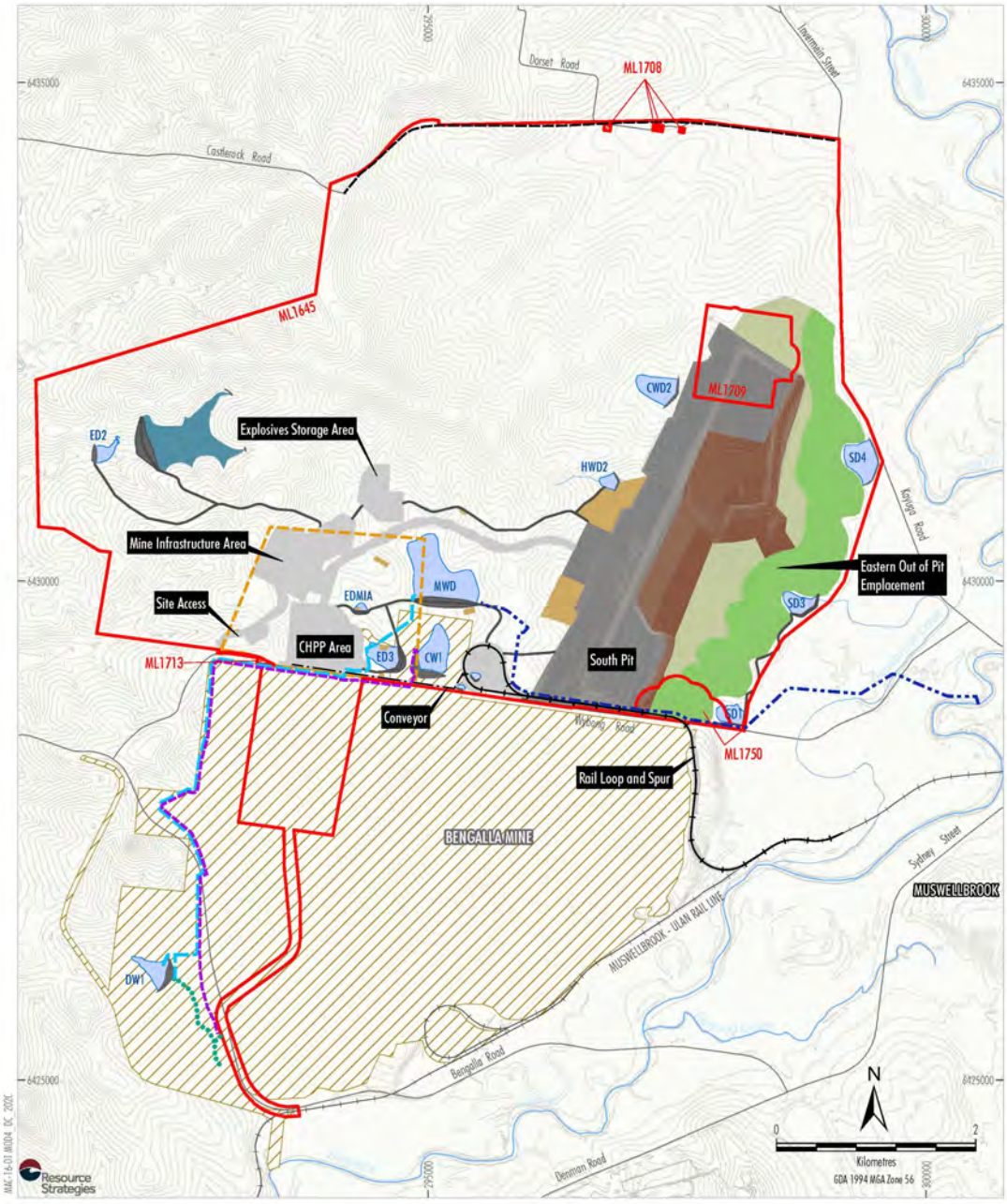


FIGURE 3 - APPROVED SURFACE DISTURBANCE PLAN

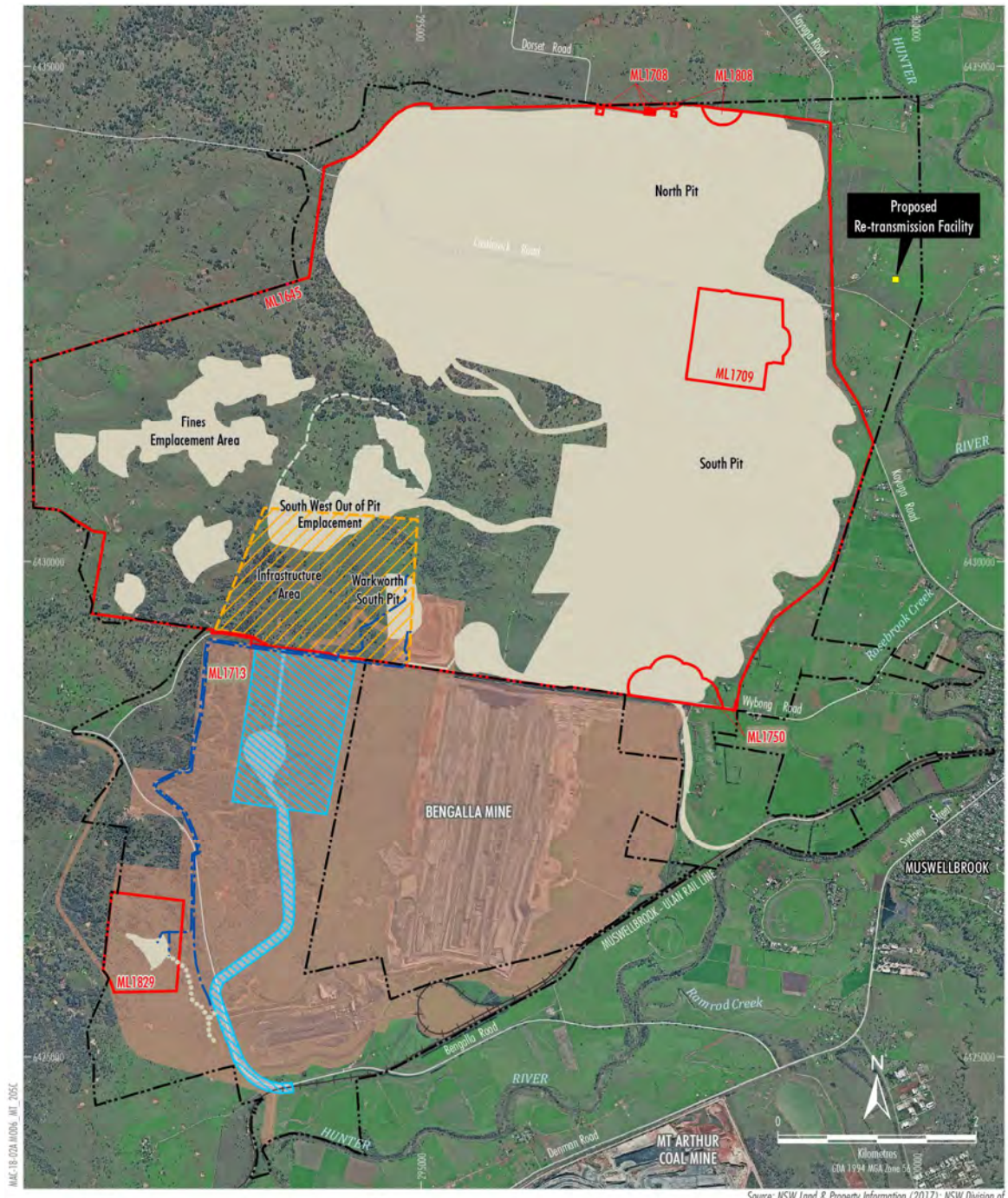
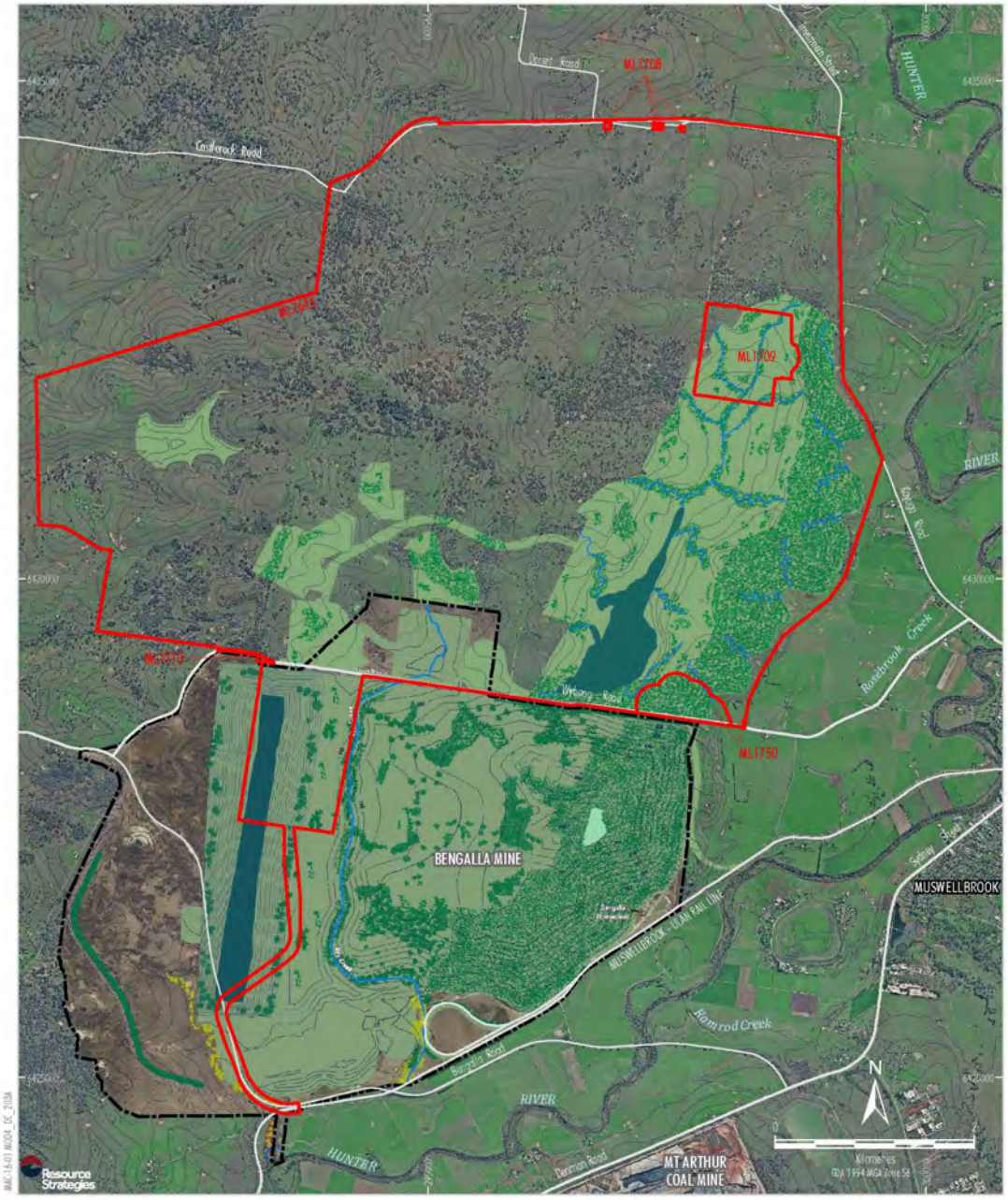


FIGURE 4 - CONCEPTUAL FINAL LANDFORM



LEGEND

- Mt Pleasant Mining Lease Boundary
- Final Void
- Final Rehabilitation
- Bengalla Mine Conceptual Final Landform *
- Project Boundary (Appendix 2 of Development Consent SSD-5170) (Dated 23 December 2016)
- Dry Creek
- Final Void Lake
- Rehabilitation
- Rehabilitation Class III
- Indicative Tree Screens (or equivalent)
- Treed Rehabilitation
- Indicative Restorative Area

* Digitised from Appendix 9 of Development Consent (SSD-5170) and amended in the Mount Pleasant Operation ChPP area.

Source: NSW Land & Property Information (2017); NSW Division of Resources & Energy (2017); Department of Planning and Environment (2016); MACH Energy (2017)
Orthophoto: MACH Energy (Aug 2016)

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MOUNT PLEASANT OPERATION
Conceptual Final Landform (2026)

ATTACHMENT 2

TIME EXTENSION APPROVAL TO SURRENDER DEVELOPMENT CONSENT DA 92/97

Department of Planning and Environment

Our ref: SSD-10418-PA-41

Christian Lauritzen
General Manager Resource Development
Mach Energy Australia Pty Ltd
PO Box 407
Newcastle, NSW, 2300

06/01/2025

Subject: Time Extension Request to Surrender the Development Consent Mount Plesant Open Cut Coal Mine (DA 92/97)

Dear Mr. Lauritzen

I refer to your request seeking an extension of time to surrender the development consent for the Mount Pleasant Open Cut Mine (DA92/97) in accordance with Condition A14 and Condition A15 Schedule 2 of the consent.

The Department notes in your letter dated 29 November 2024 that The Denman, Aberdeen, Muswellbrook, and Scone Healthy Environment Group Inc. has subsequently lodged a notice of appeal with the NSW Court of Appeal on 18 November 2024. As hearing dates have not yet been set, this will delay the outcome of the appeal.

I understand that MACH Energy is required to comply with Condition A14 and Condition A15, Schedule 2 until such time as DA 92/97 is surrendered. Accordingly, the Secretary has granted an extension of time, from 12 February 2025 to 12 February 2026.

If you wish to discuss the matter further, please contact Charissa Pillay on 02 99955944.

Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Secretary

ATTACHMENT 3

APPENDIX 2 OF DEVELOPMENT CONSENT SSD 10418

APPENDIX 2 DEVELOPMENT LAYOUT PLANS

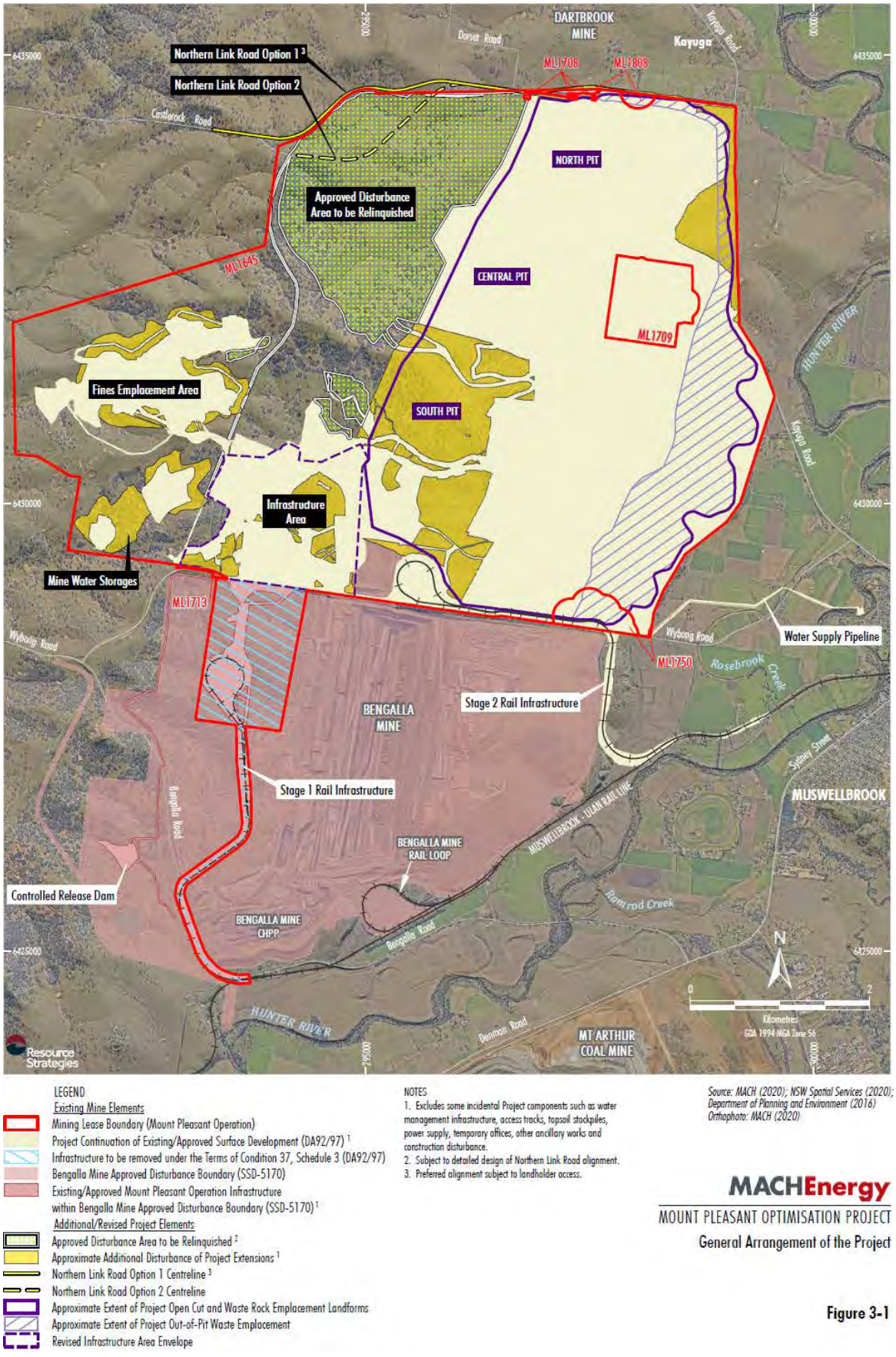


Figure 1: General Project Arrangement

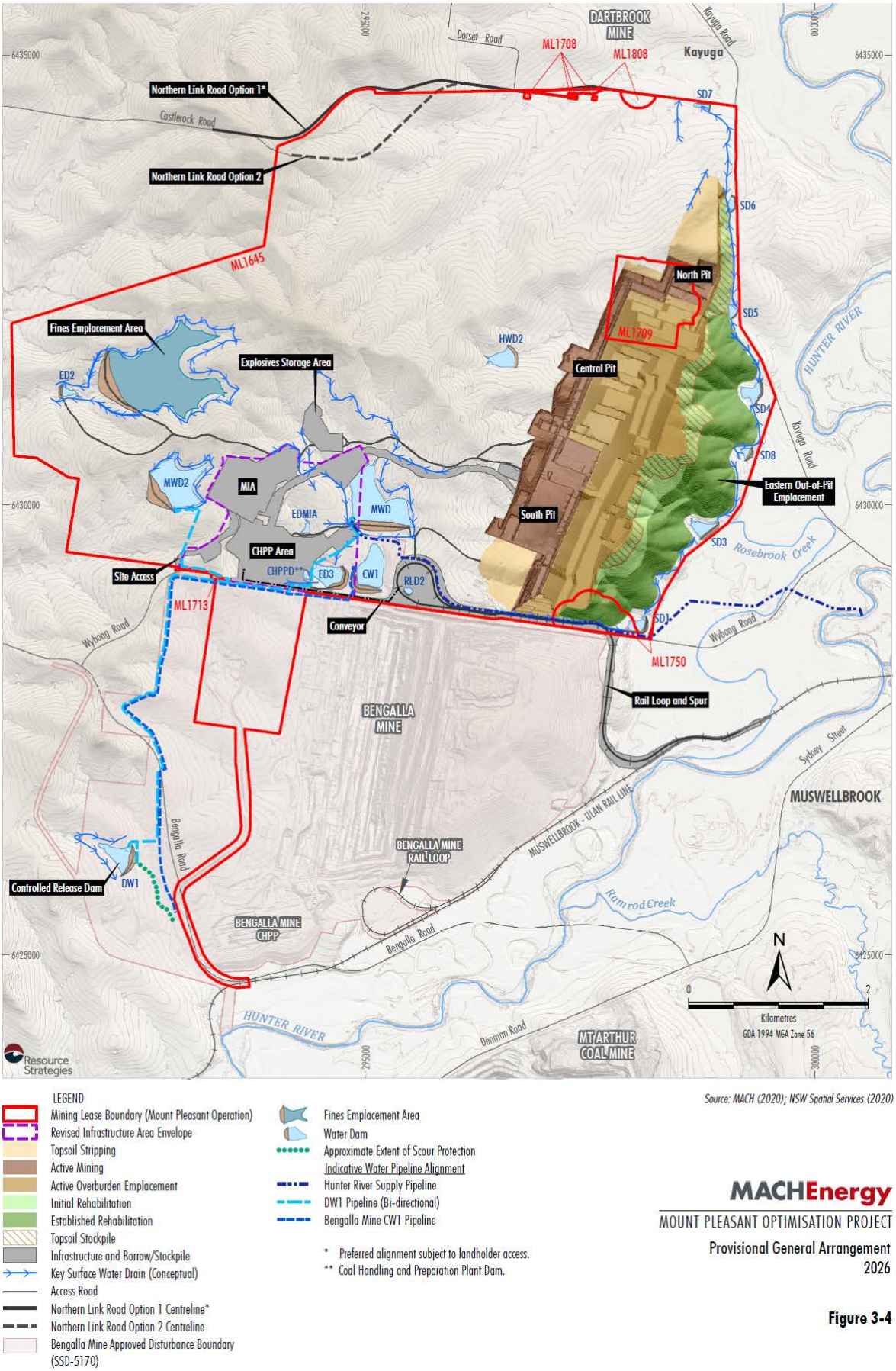
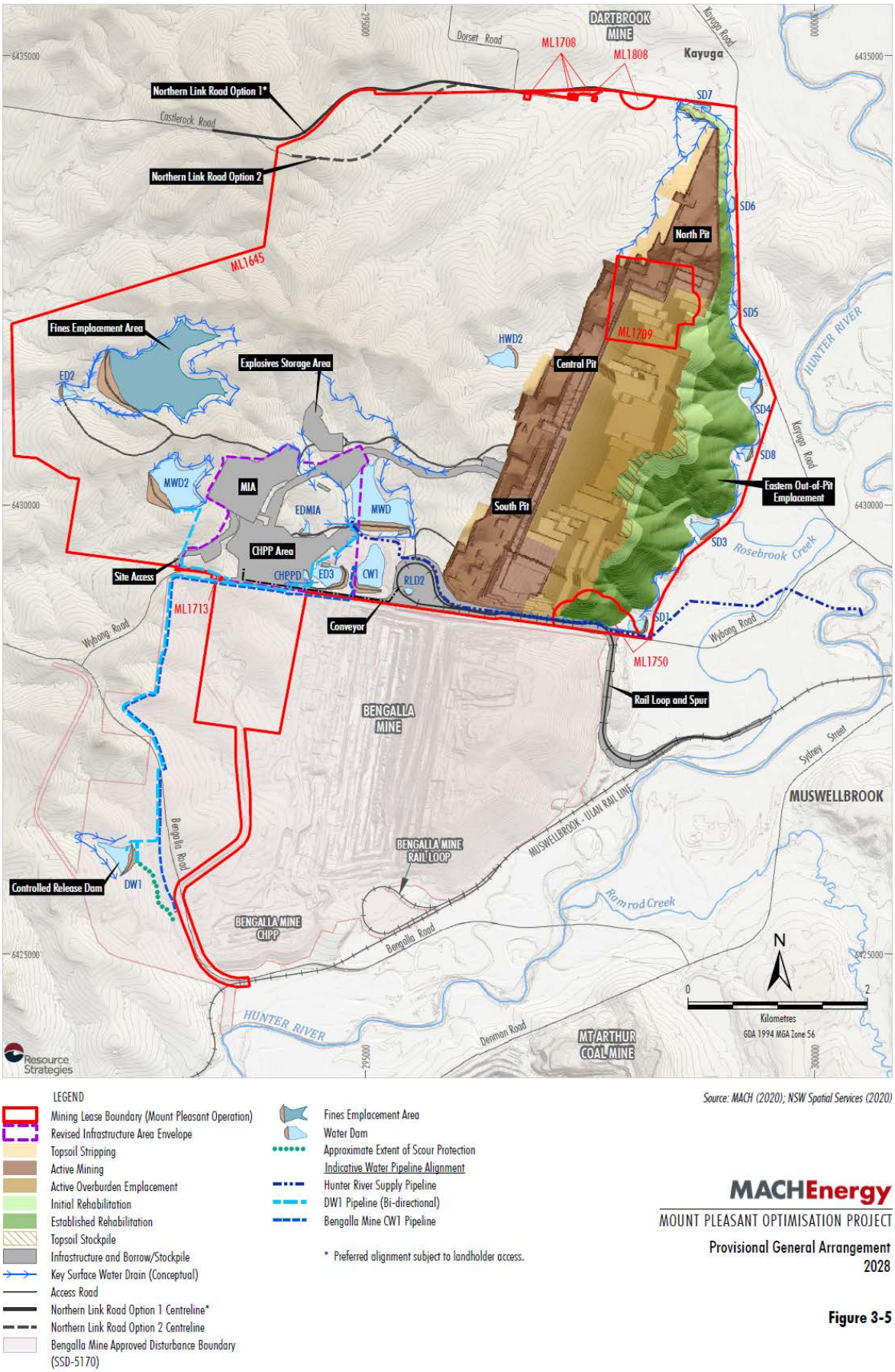


Figure 2: General Project Arrangement – 2026



LEGEND

- Mining Lease Boundary (Mount Pleasant Operation)
- Revised Infrastructure Area Envelope
- Topsoil Stripping
- Active Mining
- Active Overburden Emplacement
- Initial Rehabilitation
- Established Rehabilitation
- Topsoil Stockpile
- Infrastructure and Borrow/Stockpile
- Key Surface Water Drain (Conceptual)
- Access Road
- Northern Link Road Option 1 Centreline*
- Northern Link Road Option 2 Centreline
- Bengalla Mine Approved Disturbance Boundary (SSD-5170)
- Fines Emplacement Area
- Water Dam
- Approximate Extent of Scour Protection
- Indicative Water Pipeline Alignment
- Hunter River Supply Pipeline
- DW1 Pipeline (Bi-directional)
- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.

Source: MACH (2020); NSW Spatial Services (2020)

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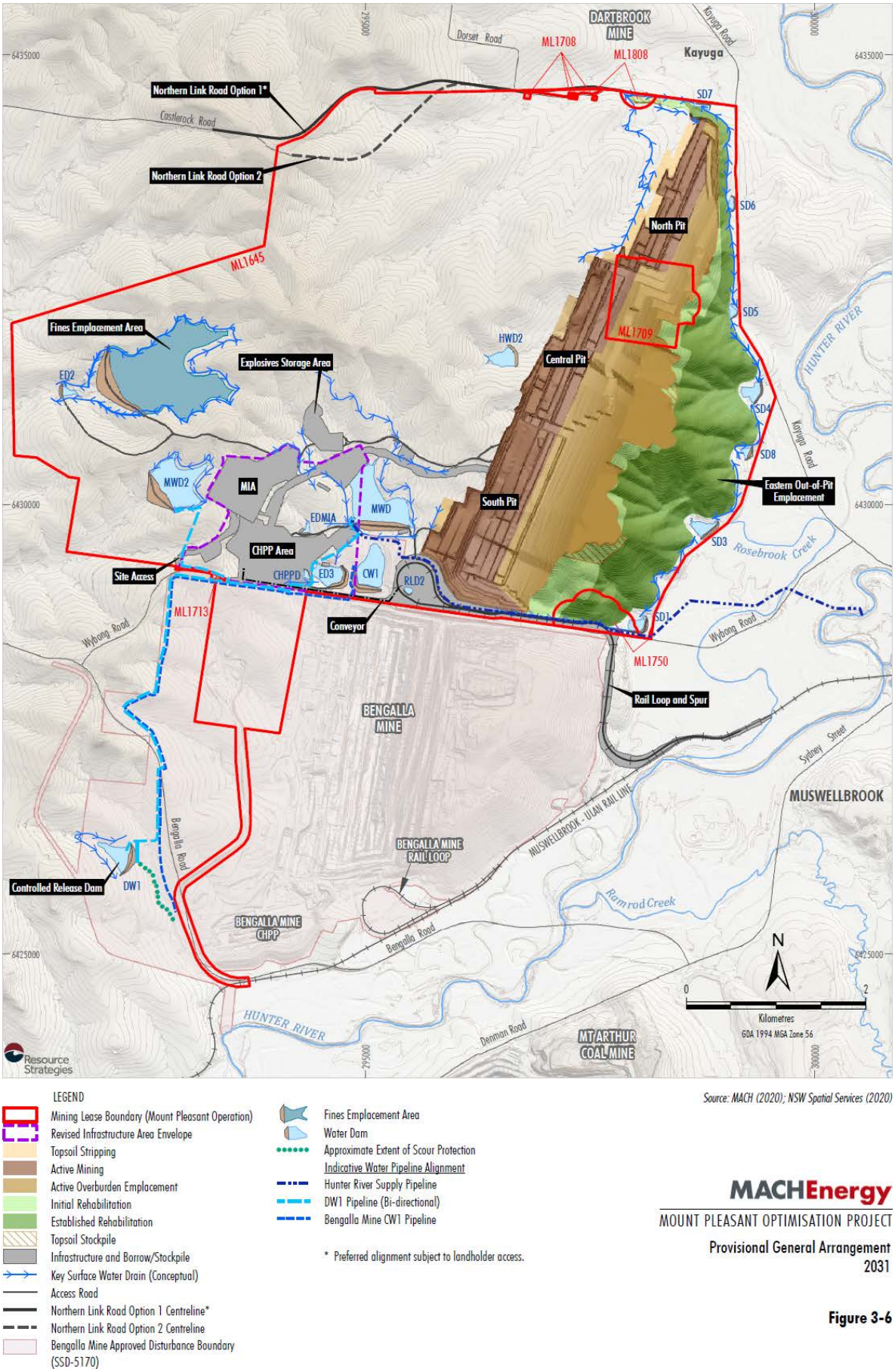
MOUNT PLEASANT OPTIMISATION PROJECT

Provisional General Arrangement 2028

Figure 3-5

Figure 3: General Project Arrangement – 2028



LEGEND

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- DW1 Pipeline (Bi-directional)
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* Preferred alignment subject to landholder access.

Source: MACH (2020); NSW Spatial Services (2020)

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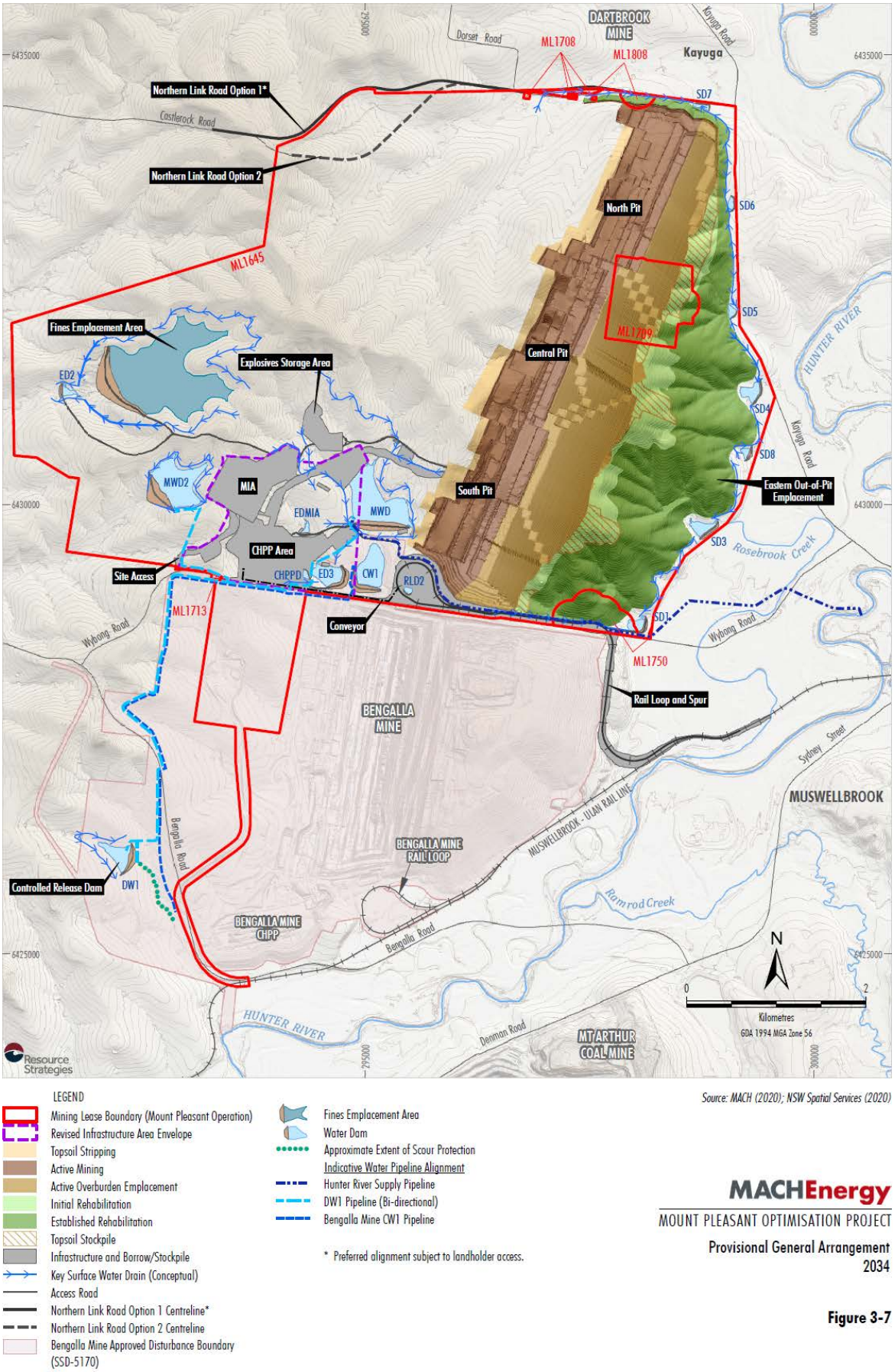
MOUNT PLEASANT OPTIMISATION PROJECT

Provisional General Arrangement 2031

Figure 3-6

Figure 4: General Project Arrangement - 2031



LEGEND

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- Indicative Water Pipeline Alignment
- Hunter River Supply Pipeline
- DW1 Pipeline (Bi-directional)
- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.

Source: MACH (2020); NSW Spatial Services (2020)

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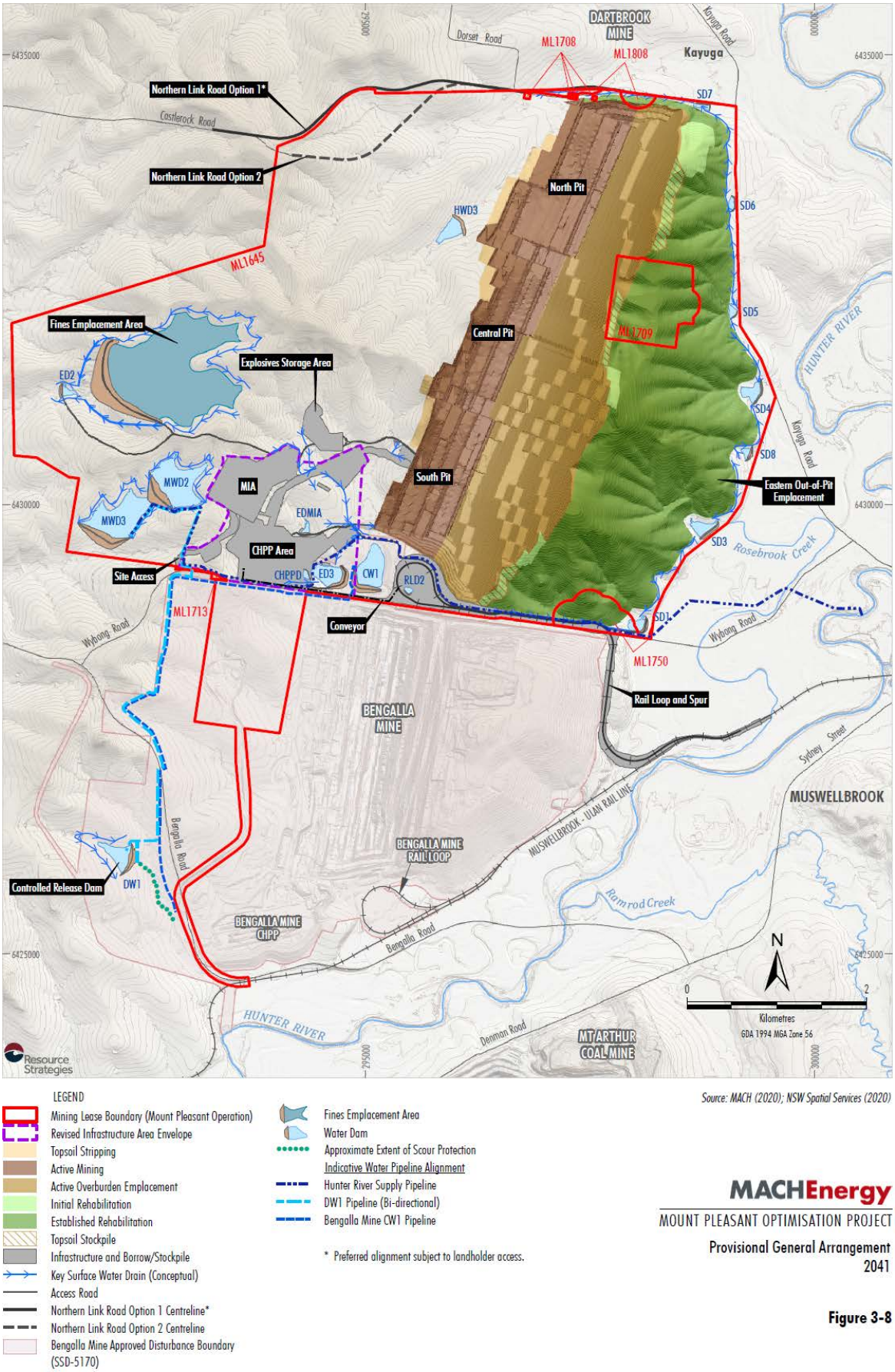
MOUNT PLEASANT OPTIMISATION PROJECT

Provisional General Arrangement 2034

Figure 3-7

Figure 5: General Project Arrangement - 2034



LEGEND

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- Bengalla Mine CW1 Pipeline

* Preferred alignment subject to landholder access.

Source: MACH (2020); NSW Spatial Services (2020)

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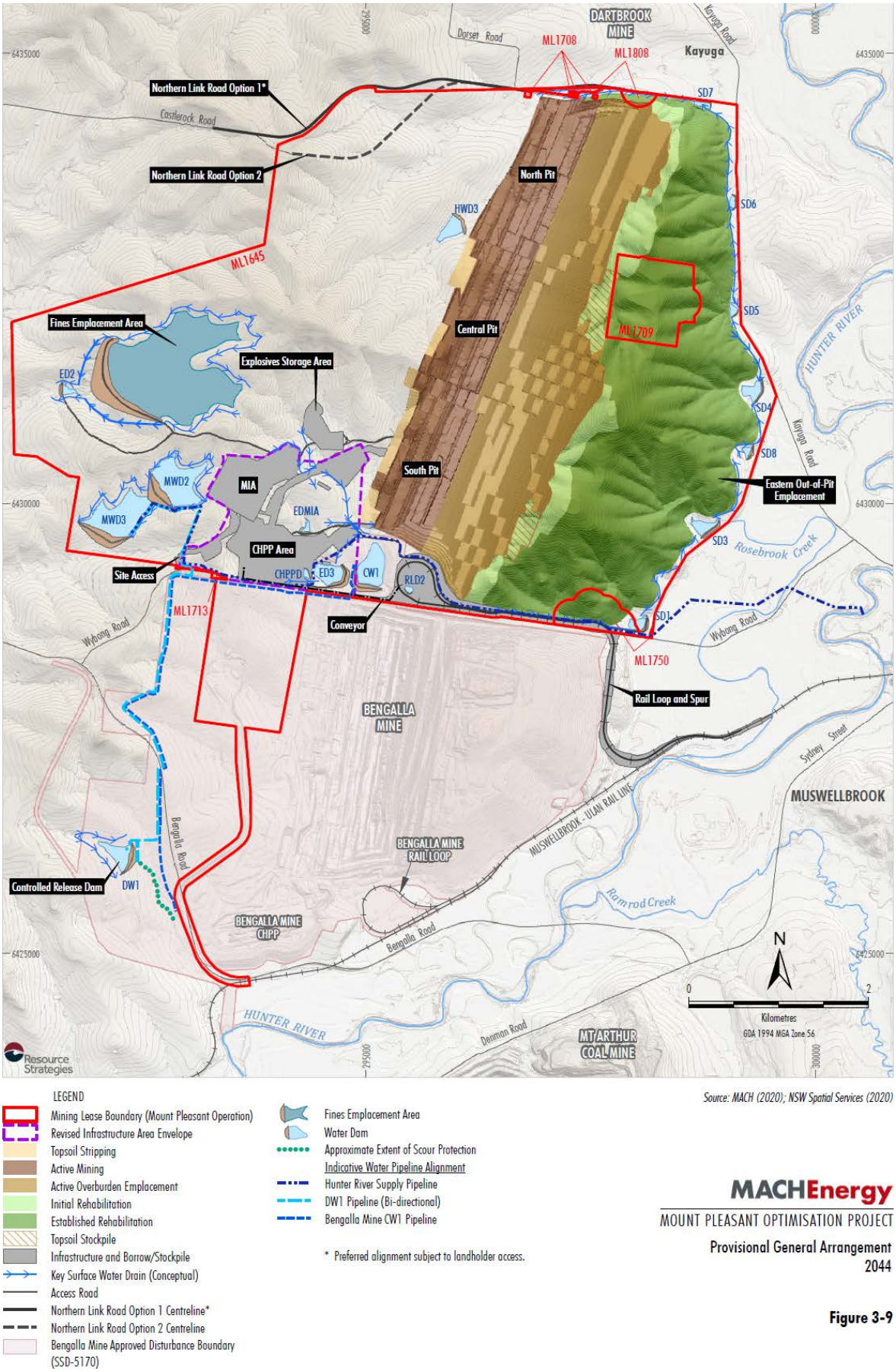
MOUNT PLEASANT OPTIMISATION PROJECT

Provisional General Arrangement 2041

Figure 3-8

Figure 6: General Project Arrangement - 2041



LEGEND

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* Preferred alignment subject to landholder access.

Source: MACH (2020); NSW Spatial Services (2020)

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MOUNT PLEASANT OPTIMISATION PROJECT

Provisional General Arrangement 2044

Figure 3-9

Figure 7: General Project Arrangement - 2044

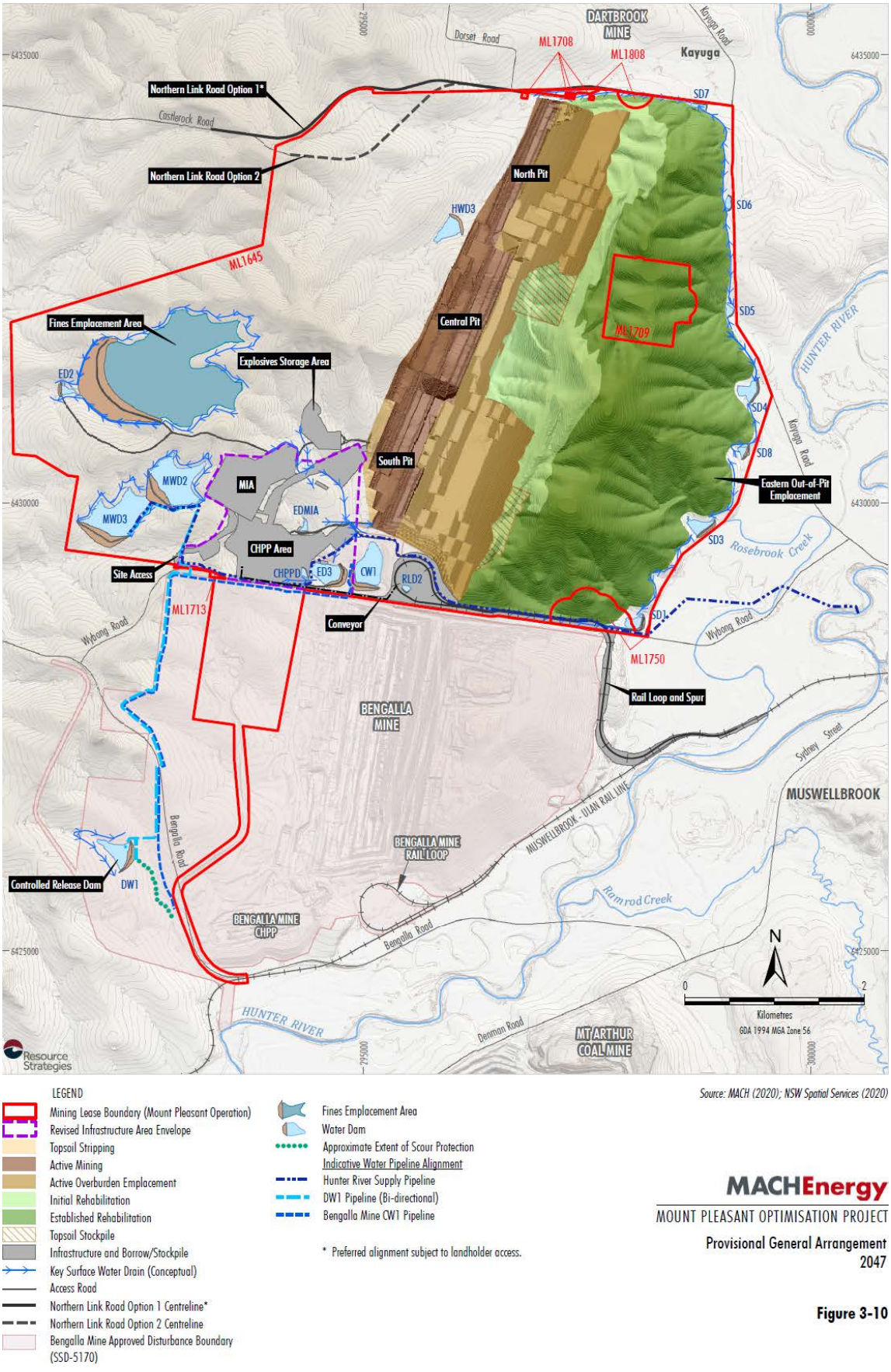


Figure 8: General Project Arrangement – 2047

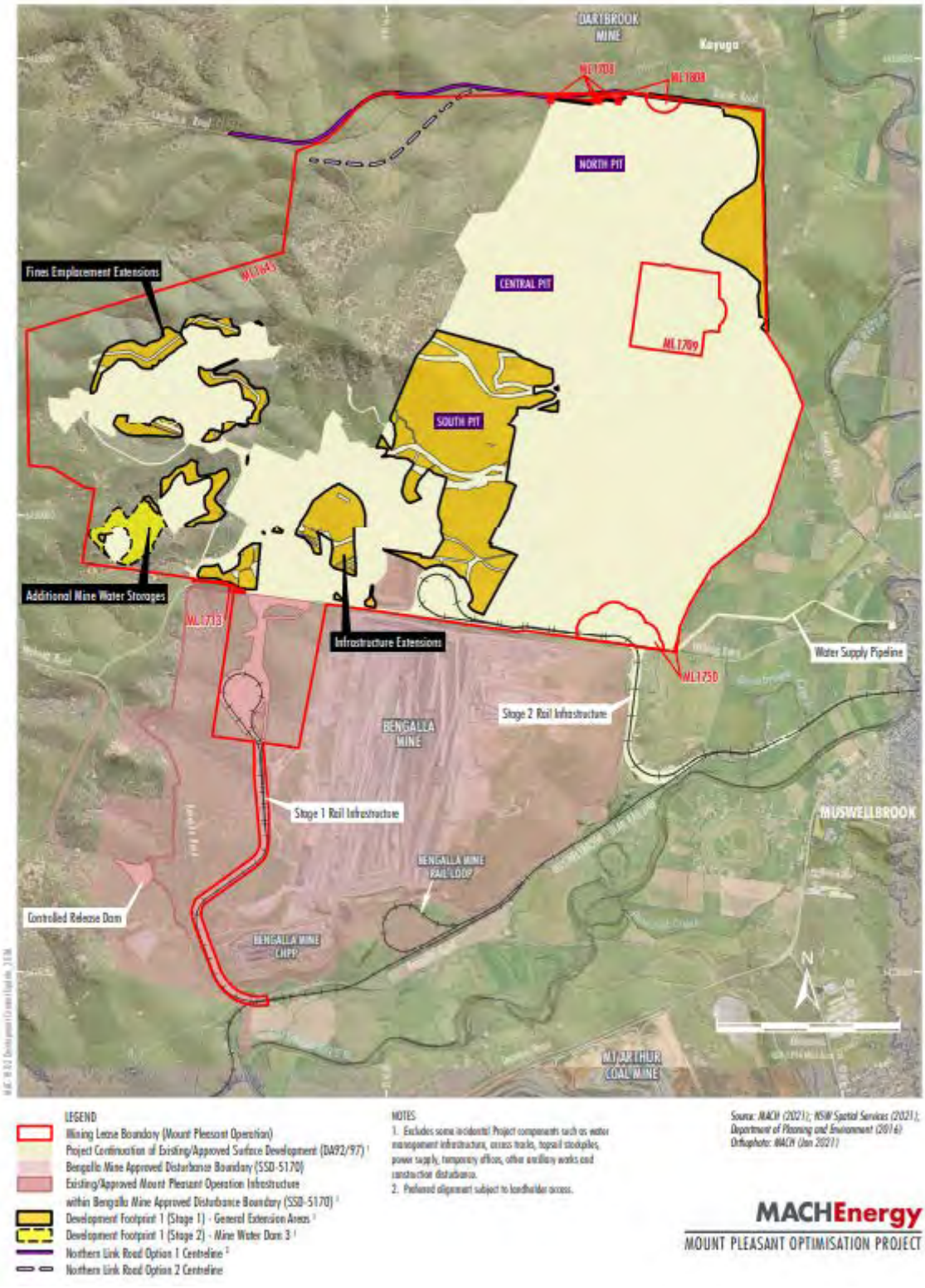


Figure 9: Staging of Project Disturbance Areas

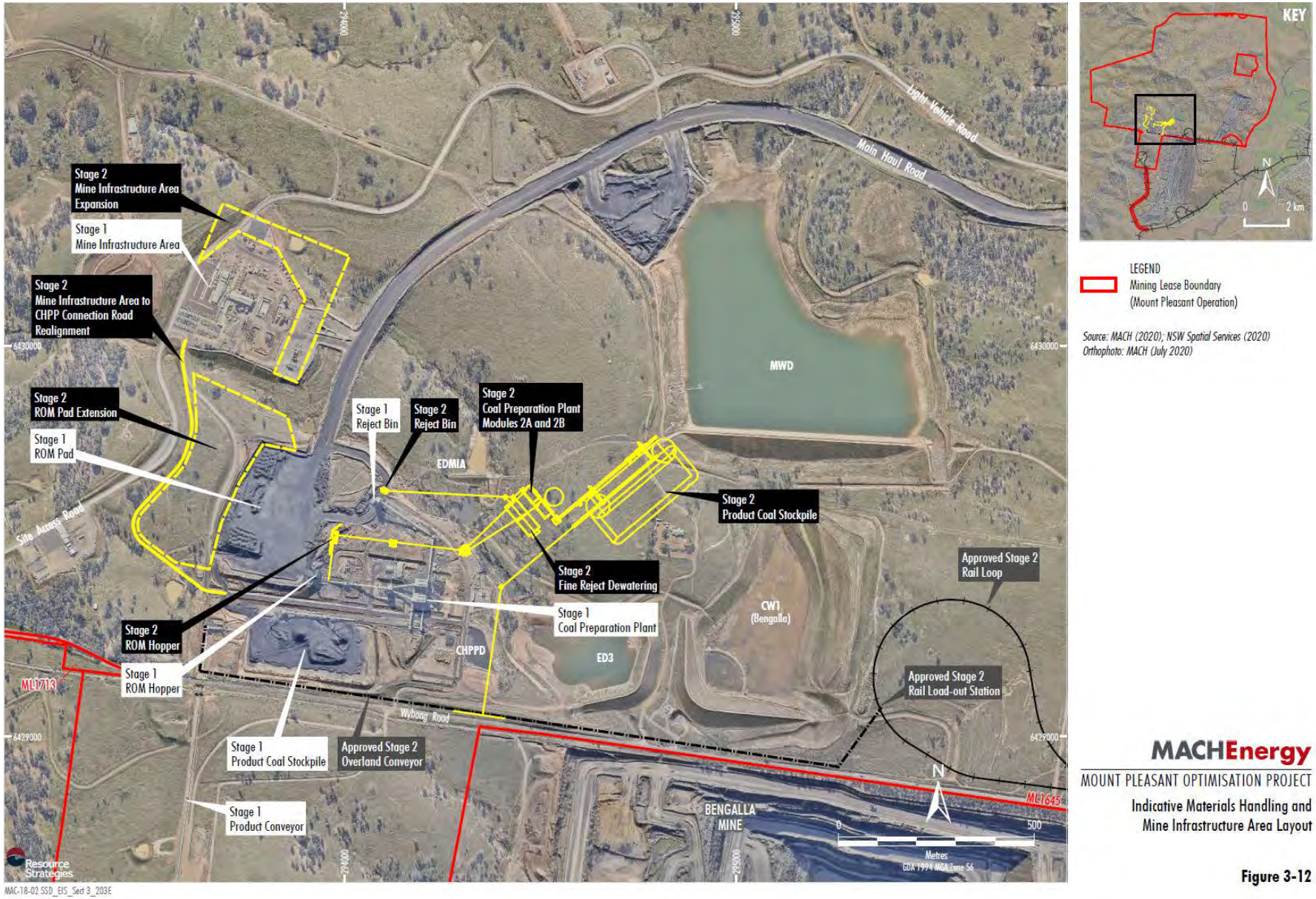


Figure 10: Indicative Mine Infrastructure Area Layout

ATTACHMENT 4

ENDORSEMENT OF CHLOE ANNANDALE

Department of Planning and Environment

Our ref: SSD-10418-PA-1

Mariah Lane
Environmental Advisor
Mach Energy Australia Pty Ltd
PO Box 407
Newcastle, NSW,2300

17/05/2023

Subject: Endorsement of Suitably Qualified and Experience Specialists for Mount Pleasant Optimisation Project

Dear Ms. Lane

I refer to your request for the Planning Secretary's endorsement of suitably qualified and experienced specialists to prepare management plans for the Mount Pleasant Optimisation Project (SSD-10418) and Mount Pleasant Coal Mine DA (92/97 until its surrender).

The Department has reviewed the nominations and information you have provided and is satisfied that the following specialists are suitably qualified and experienced. Accordingly, I can advise that the Planning Secretary approves/endorses the appointment of the following specialists:

- Dr Colin Driscoll of Hunter Eco for preparation of the Biodiversity Management Plan
- Chloe Annandale of Landroc for preparation of the Rehabilitation Strategy
- John Wassermann of RWDI for the preparation of the Blast Management Plan and Noise Management Plan
- Jamie Reeves of Niche Environment and Heritage for the preparation of the Aboriginal Cultural Heritage Management Plan
- Aleks Todoroski of Aleks Air Sciences for the preparation of the Air Quality and Greenhouse Gas Management Plan
- Dr Andrew Sneddon of Extent for the preparation of the Historic Heritage Management Plan
- Penny Dalton of TTPP for the preparation of the Traffic Management Plan
- Camilla West of ATC Williams and Bryce McKay of AGEC for the preparation of the Water Management Plan

If you wish to discuss the matter further, please contact Wayne Jones on (02) 6575 3406.

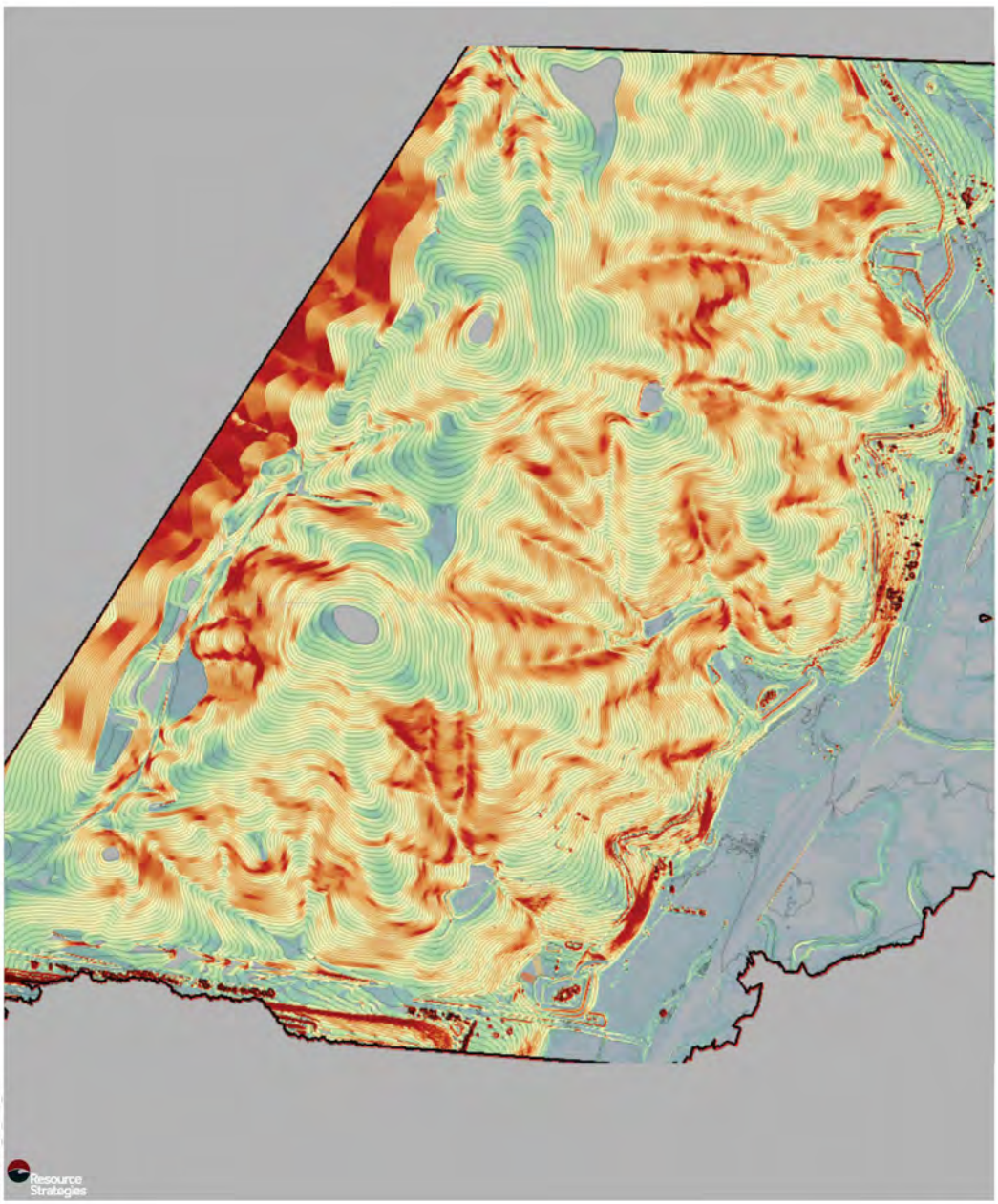
Yours sincerely

Stephen O'Donoghue
Director
Resource Assessments
As nominee of the Planning Secretary

ATTACHMENT 5

EXAMPLE CONCEPTUAL FINAL LANDFORM SLOPE ANALYSIS

TOC



Source: Golder (2020)

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MOUNT PLEASANT OPTIMISATION PROJECT

Example Conceptual Final Landform
Slope Analysis

Figure 6

APPENDIX A

CONSULTEE FEEDBACK – KEY CORRESPONDENCE

Department of Climate Change, Energy, the Environment and Water

Your ref: your email dated 13 May 2025
Our ref: DOC25/385961-4

Lisa Richards
Environment and Community Manager
MACH Energy Australia Pty Ltd
1100 Wybong Road, PO Box 351
Muswellbrook NSW 2333

By email: lisa.richards@machenergy.com.au

Dear Lisa,

Mount Pleasant Operation - Rehabilitation Strategy (SSD 10418)

Thank you for your email request dated 13 May 2025 seeking advice from the Conservation Programs, Heritage & Regulation Group (CPHR) of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) on the Mount Pleasant Operation - Rehabilitation Strategy (SSD 10418).

The Rehabilitation Strategy refers to several ancillary plans and documents including: the Rehabilitation Management Plan (RMP), the Biodiversity Management Plan (BMP), the Visual Impact Management Plan and the Rehabilitation Monitoring Manual. CPHR understands that detailed management actions, performance indicators, monitoring methodologies and completion criteria will be presented in the RMP and BMP. CPHR has not reviewed these plans and is unable to comment on documents not provided.

CPHR comments on the Rehabilitation Strategy and recommendations to be addressed in the RMP are provided in Attachment 1.

If you have any further questions about this issue, please contact the Hunter Central Coast Planning Team at huntercentralcoast@environment.nsw.gov.au.

Yours sincerely

Joe Thompson
Director Hunter Central Coast
Conservation Programs, Heritage & Regulation Group (CPHR)

17 June 2025

Enclosure – Attachment 1

Attachment 1 - CPHR Comments

Mount Pleasant Operation - Rehabilitation Strategy (SSD 10418)

In preparing this advice CPHR has reviewed the following documents:

- Mount Pleasant Operation Rehabilitation Strategy V4, MACH Energy

Key Assessment Issues

1.	Final void design	The Rehabilitation Strategy has not assessed how the final void layout mitigates the risk of interaction with floodwaters from the Hunter River. Development Consent DA 92/97 requires that final voids be designed to minimise, to the greatest extent practicable, the risk of flood interaction. The strategy does not demonstrate whether this requirement has been met. **Recommended action:** The proponent should provide further information demonstrating that the final voids will have minimal interaction with Hunter River flooding. The assessment should confirm that the voids are located outside the flood extents for all flood events up to the Probable Maximum Flood.
	Extent and Timing	Post Approval

2.	Rehabilitation management	The Rehabilitation Strategy provides high-level objectives but is lacking detail on how on-ground works will be managed and monitored. **Recommended action:** The proponent should provide a Rehabilitation Management Plan (RMP) in accordance with Part B, Condition B92 of Development Consent SSD 10418. The RMP should align with the Rehabilitation Strategy, the Biodiversity Management Plan, and all other relevant management plans, to ensure consistency. This will support outcomes being achieved in accordance with the conditions of consent. The RMP should include: • Establishment of Vegetation Management Zones to reflect the proposed management activities and objectives across management areas, supported by a map showing the location and extent of the zones. • A monitoring program including specific and measurable criteria to ensure that rehabilitation objectives are being met. • Objectives, completion criteria and performance indicators for threatened species to ensure positive outcomes for all threatened species know to occur onsite. • Maps that depict management and rehabilitation actions, represent outcomes, and align with all other plans.
	Extent and Timing	Post Approval

3.	Habitat connectivity	Habitat connectivity within the rehabilitated landscape (particularly east-west across the site and to the Hunter River) is unclear. **Recommended action:** The proponent should provide more detail on land use and potential future corridor connectivity in an approved RMP. The RMP should include: • Clear delineation between land to be rehabilitated to native ecosystems (Domain A) and land earmarked for high and low intensity agriculture (Domain B), and the exclusion of all agricultural activity from Domain A. • A map of the "connectivity corridor" referred to in Section 4.3.3 of the RS. • Incorporation of an east-west corridor across the site, to allow for wildlife connectivity between grassy woodlands on hillslopes in the west of the site through to the Hunter River in the east. This may involve planting of native trees and shrubs in agricultural Domain B, or the reclassification of a section of Domain B and to Domain A - Native Ecosystem. • Confirmation that the establishment of Grazing Land Use Domain will not involve any clearing of existing native vegetation.
	Extent and Timing	Post Approval

4.	Rehabilitation species lists and maps	The Rehabilitation Strategy provides provisional species lists developed in consultation with specialist ecologists. The variety of species and strata presented in the provisional species lists are appropriate, as is the use of seed harvested on site. Additional detail is required including a map of proposed PCT plantings, to be provided in the RMP. **Recommended action:** Any changes to the provisional species list should be reviewed by specialist ecologists for their appropriateness to the target Plant Community Types for rehabilitation. The proponent should provide the following information in the RMP: • Figures indicating where the proposed PCTs will be established on site and the area (hectares) of revegetation. • The results of trial plantings of PCT 1543 Rusty Fig – Native Quince – Native Olive dry rainforest of the Central Hunter Valley and the incorporation of this PCT into the rehabilitation plantings if trials are successful.
	Extent and Timing	Post Approval

From: info@sys.resources.nsw.gov.au <info@sys.resources.nsw.gov.au>
Sent: Wednesday, 16 July 2025 11:31 AM
To: Lisa Richards <lisa.richards@machenergy.com.au>
Cc: catherine.lewis@regional.nsw.gov.au
Subject: AREQ0064355 | MPO - Rehabilitation Strategy (SSD 104148) - NSW RR Consultation

Dear Lisa,

I refer to your email dated 30 May 2025 requesting the Resources Regulator's comments on the Rehabilitation Strategy for Mount Pleasant Coal Mine. My apologies for the delayed response.

The Regulator has no specific comments on the document, however, you are reminded that you will need to ensure that key documents required under Schedule 8A are updated where required. Specifically, the following:

- Rehabilitation Management Plan under cluse 10 - specifically the Life of Mine rehabilitation schedule in Part 6.1
- Final Landform and Rehabilitation Plan and Rehabilitation Objective Statement under clause 12

If you have any questions, please don't hesitate to call.

Regards,

Matthew Newton
Principal Inspector Environment & Rehab
MAI - Strategy Advise and Programs | Resources Regulator
T 0249316745 M 0418739611

Ref:MSG1675230_uTYDELRvWG3eudwGhXer

Enquiries
Please ask for Tracy Ward
Direct 02 6549 3700
Our reference CM 25/12171

17 April 2025

Lisa Richards
Environment and Community Manager
MACH Energy

Dear Ms Richards

MACH Energy Mount Pleasant Operations – Muswellbrook Shire Council (Staff) comments on Rehabilitation Strategy

Reference is made to the "*MACH Energy Mount Pleasant Operation Rehabilitation Strategy v4*" (Rehabilitation Strategy). The Rehabilitation Strategy has been prepared by MACH Energy to satisfy the requirements of Schedule 3, Condition 54 of Development Consent DA 92/97 (prior to its surrender) and Part B, Condition B89 of Development Consent SSD 10418.

Staff have reviewed the Rehabilitation Strategy and provide the following commentary.

General

1. Staff are pleased to note that previous suggestions made by Staff in 2019 have been incorporated into this revision of the Rehabilitation Strategy particularly the progressive rehabilitation proposed and the inclusion of micro and macro relief in the works resulting in a final landform that is more natural in appearance.

2. Staff are pleased to note that there will be no highly competitive exotic grasses or non-local Australian tree species to be used in the works. It is appropriate that restoration ecologists and experts in mine site restoration have been involved in developing species lists for these works.

3. It is understood that the revegetation works on the void walls and batters will be used for stabilisation and aesthetic purposes rather than forming riparian habitat.

Habitat for Threatened Species

4. In 2005, flying-foxes established a camp at Muscle Creek and on a section of the Hunter River on land owned by Council and Australian Rail Track Corporation (ARTC). The camp is located close to residential areas and in proximity to a caravan park and public facilities including walk ways, recreational areas, sporting fields, clubs, hotels and the local hospital.

   Historically, the camps have been occupied by the threatened Grey-Headed Flying fox and in recent years, Little Red Flying-foxes. Disturbance to threatened flying foxes and their habitat is limited by legislative requirements.

   Flying-foxes predominantly roost in trees within the riparian zone surrounding Muscle Creek and the Hunter River. It would be ideal to establish suitable habitat in areas outside the current camp locations, as research suggest camps can be encouraged to move out of urban areas if there is suitable habitat nearby.

   Staff request that MACH Energy consider roosting and foraging habitat for the Grey Headed Flying Fox (*Pteropus poliocephalus)* included in the Native Ecosystem Re-establishment and encourage the use of species from the reclassified PCT 3314, PCT 3315, PCT 3395, and PCT 3396 to facilitate this.

Agricultural productivity and production of non-operational project-related land

5. Cond B87 of SSD 10418 requires the following:

   Maintain the agricultural productivity and production of non-operational project-related land.

   There appears to be no discussion to address this objective, for example, whether there is co-existence of agriculture and mining on the non-operational project-related land. It would be beneficial to include a discussion on this, including how (if relevant) agricultural use is currently being maintained, whether grazing performance is being monitored, and whether any improvements or land management practices have been implemented to support ongoing agricultural productivity.

Post mining land use

6. Staff note several commitments throughout the Rehabilitation Strategy that post mining land uses may be refined through further consultation with Council. Staff look forward to consultation in relation to the Mine Closure Plan once this is available.

7. Staff note Section 4.2.1 which states 'MACH Energy would decommission and remove all Project infrastructure unless a suitable post-mining use is identified for the infrastructure in consultation with the NSW Resources Regulator and MSC'.

   Council has raised concerns with the State Government that, from an environmental and social perspective, the requirement to remove all on-site infrastructure may lead to several negative outcomes, including the unnecessary loss of valuable resources and assets. It is hoped that this issue will be reviewed and addressed through future State policy or guideline updates.

8. In relation to the post-mining land use strategy, as required under Condition B89(k) of SSD-10418, Staff are not satisfied with the level of detail provided in Section 6 of the Rehabilitation Strategy. In 2023, the Department of Regional NSW released its *Practical Guide – Post-Mining Land Use* (the Practical Guide). Section 4 of the Practical Guide specifically outlines the recommended process for identifying and planning alternative land uses for former mine sites.

   Whilst Staff acknowledge that mining under SSD-10418 has only recently commenced and that planning for alternate post-mining land uses may seem premature, Staff would, at a minimum, expect a clear commitment from MACH Energy that such planning will be undertaken in accordance with the Practical Guide (or its most current version).

Final void

9. In relation to the final void, Cond B87 of SSD 10418 requires the following:

   Minimise to the greatest extent practicable having regard to post-mining beneficial land uses for the size and depth.

   Section 4.5 of the Rehabilitation Strategy discusses the final void; however, it does not include any commitment to consider further refinement of its size or depth. Rather, it states that design alternatives were considered during the preparation of the Environmental Impact Statement (EIS), and it appears that no additional refinement will be investigated.

   Staff are of the view that, to meet the rehabilitation objective outlined above, MACH Energy should continue to review and assess opportunities to reduce the size and depth of the final void as the project progresses.

The same applies for the objective related to high wall instability risk.

10. Staff encourage further exploration into alternative uses of the final void and any water contained within the voids as this is still an area of concern. It is assumed that some of this work will be captured in the Mine Closure Plan, and Staff look forward to being consulted during its development.

11. In relation to potential uses of the final void outlined in Section 4.5:

    a. Staff are concerned that using evaporative controls for water quality could result in water quality degradation and a loss of water resources, which could impact downstream users and ecosystems.
    b. Staff are concerned that using a final void as a waste disposal site could lead to leachate contamination of groundwater and nearby water courses. Staff are also concerned that due to the nature of waste, this may impact the void long-term.

12. With an increasing number of final voids being proposed across the Upper Hunter Valley, Staff are of the opinion that further work needs to occur to prevent long-term issues being passed on to future generations in the region.

Final landform

13. Section 4.2.4 of the Rehabilitation Strategy states 'MACH Energy has incorporated significant areas of the outer emplacement batters at slopes of less than 10 degrees (lower slopes), and more limited areas of slopes up to approximately 14 degrees (upper slopes).... MACH Energy will continue to refine the design of the proposed final landform, and where relevant, will justify areas to be constructed at steep grades (including slopes greater than 14 degrees)'.

    Section 5.2.1 of 'EIS Attachment 8 – Rehabilitation and Mine Closure Addendum' (the Addendum) notes that 'there are some areas where the slopes are up to 33% (18 degrees) but this only represents a small proportion of the total surface area of the final landform'. Figure 6 of the Addendum provides an example of the final landform slope analysis to support this statement.

    Staff consider that there may be merit in including the slope analysis within the Rehabilitation Strategy to provide greater clarity and support for the proposed final landform design.

Council staff appreciate the opportunity to comment and would be pleased to provide additional information if requested. Should you need to discuss the above, please contact Tracy Ward, Sustainability Officer on 02 6549 3700 or email council@muswellbrook.nsw.gov.au.

Yours faithfully

Sharon Pope
Director Environment and Planning

Rehabilitation Strategy (SSD 10418) – Response to Consultation Comments (CPHR) – June 2025

Relevant Section in the Rehabilitation Strategy	CPHR Comment	MACH Energy Response
Section 4.5	1. Final Void The Rehabilitation Strategy has not assessed how the final void layout mitigates the risk of interaction with floodwaters from the Hunter River. Development Consent DA 92/97 requires that final voids be designed to minimise, to the greatest extent practicable, the risk of flood interaction. The strategy does not demonstrate whether this requirement has been met. **Recommended action:** The proponent should provide further information demonstrating that the final voids will have minimal interaction with Hunter River flooding. The assessment should confirm that the voids are located outside the flood extents for all flood events up to the Probable Maximum Flood.	The easternmost extent of the Mount Pleasant Operation mine landform is located outside of the 1% AEP flood extent for the Hunter River. The potential for the mine landform to result in changes to flood depth, extent or velocity in the vicinity of the Mount Pleasant Operation is considered to be negligible (Appendix D of the Mount Pleasant Optimisation Project EIS). Additionally, the final void will act as a groundwater sink, reducing the potential for groundwater quality impacts. It will be located closer to the Fines Emplacement Area, drawing seepage towards the final void, as opposed to the Sandy Creek alluvium. The greater depth of the final void will also increase the hydraulic gradient from the Eastern Out-of-Pit Emplacement towards the final void, reducing the potential for seepage towards the Hunter River alluvium. Seepage from the MPO is also predicted to report to the Bengalla voids. The revised final void water balance (AGE Consultants, 2021) demonstrates that the water level will remain significantly below the crest of the final void. The final void water level is predicted to be approximately 75 meters Australian Height Datum (m AHD), 125 m below the spill level (i.e. the final void is contained). Once mining operations cease, groundwater inflows to the final void would no longer be collected and pumped out. As a result, the final void will gradually fill with water. Inflows into the final void will comprise incident rainfall, runoff within the final void catchment area and groundwater. Section 4.5 of the Rehabilitation Strategy has been updated to include the additional information discussed above.
-	2. Rehabilitation Management The Rehabilitation Strategy provides high-level objectives but is lacking detail on how on-ground works will be managed and monitored. **Recommended action:**	The Rehabilitation Management Plan (RMP) has been updated by MACH Energy to incorporate Development Consent SSD 10418, and is available on the website: https://machenergyaustralia.com.au/mount-pleasant/documentation/.

Relevant Section in the Rehabilitation Strategy	CPHR Comment	MACH Energy Response
	The proponent should provide a Rehabilitation Management Plan (RMP) in accordance with Part B, Condition B92 of Development Consent SSD 10418. The RMP should align with the Rehabilitation Strategy, the Biodiversity Management Plan, and all other relevant management plans, to ensure consistency. This will support outcomes being achieved in accordance with the conditions of consent. The RMP should include: • Establishment of Vegetation Management Zones to reflect the proposed management activities and objectives across management areas, supported by a map showing the location and extent of the zones. • A monitoring program including specific and measurable criteria to ensure that rehabilitation objectives are being met. • Objectives, completion criteria and performance indicators for threatened species to ensure positive outcomes for all threatened species know to occur onsite. • Maps that depict management and rehabilitation actions, represent outcomes, and align with all other plans.	The RMP has been updated to align with the Rehabilitation Strategy, the Biodiversity Management Plan, and all other relevant management plans, to maintain consistency with Development Consent SSD 10418. The RMP includes the following (and in accordance with the *Form and Way - Rehabilitation management plan for large mines* guideline): • Establishment of Vegetation Management Zones to reflect the proposed management activities and objectives across management areas, supported by a map showing the location and extent of the zones. • A monitoring program including specific and measurable criteria to ensure that rehabilitation objectives are being met. • Objectives, completion criteria and performance indicators for threatened species to ensure positive outcomes for all threatened species know to occur onsite. • Maps that depict management and rehabilitation actions, represent outcomes, and align with all other plans.
-	3. Habitat Connectivity Habitat connectivity within the rehabilitated landscape (particularly east-west across the site and to the Hunter River) is unclear. **Recommended action:** The proponent should provide more detail on land use and potential future corridor connectivity in an approved RMP. The RMP should include: • Clear delineation between land to be rehabilitated to native ecosystems (Domain A) and land earmarked for high and low intensity agriculture (Domain B), and the exclusion of all agricultural activity from Domain A. • A map of the “connectivity corridor” referred to in Section 4.3.3 of the RS.	The RMP has been updated by MACH Energy to incorporate Development Consent SSD 10418. The rehabilitation objectives statement describes the rehabilitation outcomes required to attain the final land use for the mining area. The rehabilitation objectives statement for the Mount Pleasant Operation (under SSD 10418) was recently approved and has been incorporated into the RMP. The final landform and rehabilitation plan (SSD 10418) has also been submitted for approval by the NSW Resources Regulator. These rehabilitation outcome documents form part of the RMP and address the comments provided by CPHR in relation to:

Relevant Section in the Rehabilitation Strategy	CPHR Comment	MACH Energy Response
	• Incorporation of an east-west corridor across the site, to allow for wildlife connectivity between grassy woodlands on hillslopes in the west of the site through to the Hunter River in the east. This may involve planting of native trees and shrubs in agricultural Domain B, or the reclassification of a section of Domain B and to Domain A - Native Ecosystem. • Confirmation that the establishment of Grazing Land Use Domain will not involve any clearing of existing native vegetation.	• The clear delineation between land to be rehabilitated to native ecosystems (Domain A) and land earmarked for high and low intensity agriculture (Domain B), and the exclusion of all agricultural activity from Domain A. In accordance with the rehabilitation objectives in Part B, Condition B87 (Table 10) of Development Consent SSD 10418 and Schedule 2. Condition 53 (Table 11) of Development Consent DA 92/97 (prior to its surrender), MACH Energy will establish vegetation connectivity and wildlife corridors, as far as reasonable and feasible. The previous wildlife corridor under Development Consent DA 92/97 is shown conceptually in Figure 14 of the Rehabilitation Strategy. As part of RMP, the rehabilitation objectives statement (approved) and the final landform and rehabilitation plan (submitted for approval) includes the rehabilitation outcome and spatial plan depicting the establishment of the vegetation and wildlife corridor connectivity. The Grazing Land Use Domain will be established within areas already approved for disturbance under Development Consent SSD 10418.

Relevant Section in the Rehabilitation Strategy	CPHR Comment	MACH Energy Response
-	4. Rehabilitation species lists and maps The Rehabilitation Strategy provides provisional species lists developed in consultation with specialist ecologists. The variety of species and strata presented in the provisional species lists are appropriate, as is the use of seed harvested on site. Additional detail is required including a map of proposed PCT plantings, to be provided in the RMP. **Recommended action:** Any changes to the provisional species list should be reviewed by specialist ecologists for their appropriateness to the target Plant Community Types for rehabilitation. The proponent should provide the following information in the RMP: • Figures indicating where the proposed PCTs will be established on site and the area (hectares) of revegetation. • The results of trial plantings of PCT 1543 Rusty Fig – Native Quince – Native Olive dry rainforest of the Central Hunter Valley and the incorporation of this PCT into the rehabilitation plantings if trials are successful.	Any changes to the provisional species list will be reviewed by specialist ecologists for their appropriateness to the target Plant Community Types for rehabilitation and addressed in future updates to the Rehabilitation Strategy and all other relevant management plans (i.e. RMP, Biodiversity Management Plan and the EPBC Threatened Ecological Community Mine Site Rehabilitation Plan). MACH Energy will consider the incorporation of PCT 1543 into the rehabilitation planning if trials are successful, and will continue to provide updates on the outcomes of rehabilitation trials in its Annual Review. MACH Energy is currently undertaking a detailed review of the most suitable locations for proposed PCTs and will incorporate these updates into future revisions of the RMP.

Comment Received from Muswellbrook Shire Council	Relevant Section in the Rehabilitation Strategy	MACH Energy Response
General		
1. Staff are pleased to note that previous suggestions made by Staff in 2019 have been incorporated into this revision of the Rehabilitation Strategy particularly the progressive rehabilitation proposed and the inclusion of micro and macro relief in the works resulting in a final landform that is more natural in appearance.	-	Noted.
2. Staff are pleased to note that there will be no highly competitive exotic grasses or non-local Australian tree species to be used in the works. It is appropriate that restoration ecologists and experts in mine site restoration have been involved in developing species lists for these works.	-	Noted.
3. It is understood that the revegetation works on the void walls and batters will be used for stabilisation and aesthetic purposes rather than forming riparian habitat.	-	Noted.
Habitat for Threatened Species		
4. In 2005, flying-foxes established a camp at Muscle Creek and on a section of the Hunter River on land owned by Council and Australian Rail Track Corporation (ARTC). The camp is located close to residential areas and in proximity to a caravan park and public facilities including walk ways, recreational areas, sporting fields, clubs, hotels and the local hospital. Historically, the camps have been occupied by the threatened Grey-Headed Flying fox and in recent years, Little Red Flying-foxes. Disturbance to threatened flying foxes and their habitat is limited by legislative requirements. Flying-foxes predominantly roost in trees within the riparian zone surrounding Muscle Creek and the Hunter River. It would be ideal to establish suitable habitat in areas outside the current camp locations, as research suggest camps can be encouraged to move out of urban areas if there is suitable habitat nearby. Staff request that MACH Energy consider roosting and foraging habitat for the Grey Headed Flying Fox (*Pteropus poliocephalus)* included in the Native Ecosystem Re-establishment and encourage the use of species from the reclassified PCT 3314, PCT 3315, PCT 3395, and PCT 3396 to facilitate this.	Section 4.3.1	As reported in the Biodiversity Development Assessment Report for the Mount Pleasant Optimisation Project (Hunter Eco, 2021), potential foraging habitat for the Grey-headed Flying-fox within the Subject land occurs within woodland forms of PCTs 1605 (PCT 3431), 1606 (PCT 3396) and 1691 (PCT 3314) (Department of Planning, Industry and Environment, 2020), as well as PCT 483 (PCT 3395) in which it was recorded (Future Ecology, 2020). As noted in Section 4.3.1 of the draft Rehabilitation Strategy (SSD 10418) provided to MSC: *The eastern face of the final landform will be targeted for revegetation using the species characteristic of these PCTs as conceptually shown on Figures 14 and 15 (i.e. Domain A – Native Woodland/Grassland) and Figure 20. These PCTs are proposed to provide potential habitat (in the long-term) for threatened flora and fauna that have been previously recorded in the area, including:* *…* • *Mammals:* *…* - *Grey-headed Flying-fox (Pteropus poliocephalus).* Provisional species lists for the PCT communities targeted for revegetation at the MPO (as well as a targeted native grass and sterile cover crop species list) are provided in Table 7 of the draft Rehabilitation Strategy (SSD 10418), which includes the reclassified PCT 3395, PCT 3431 and PCT 3315.

Comment Received from Muswellbrook Shire Council	Relevant Section in the Rehabilitation Strategy	MACH Energy Response
		Section 4.3.1 also identifies that the habitat requirements of the fauna species outlined in the section (including the Grey-headed Flying Fox) will be considered when selecting and placing features across the landscape. Habitat features including habitat/stag trees will be installed to provide fauna habitat across MPO rehabilitation areas. Where practicable, a minimum of two habitat/stag trees will be installed per hectare across Secondary Domain A – Native Woodland/Grassland areas (excluding inappropriate areas e.g. drainage features and water managements structures within Secondary Domain A). Where this is not possible, further augmentation of habitat will consider the use of supplementary features such as nest and bat boxes.
Agricultural productivity and production of non-operational project-related land		
5. Cond B87 of SSD 10418 requires the following: *Maintain the agricultural productivity and production of non-operational project-related land.* There appears to be no discussion to address this objective, for example, whether there is coexistence of agriculture and mining on the non-operational project-related land. It would be beneficial to include a discussion on this, including how (if relevant) agricultural use is currently being maintained, whether grazing performance is being monitored, and whether any improvements or land management practices have been implemented to support ongoing agricultural productivity.	Section 9.2.5	MACH Energy currently leases non-mining MACH-owned agricultural land to original landowners or other local farmers for ongoing productive use, and this practice would continue for the Project. MACH also undertakes its own agricultural activities on some land. A range of agricultural enterprises are also located on private land in the vicinity of the Mount Pleasant Operation. Proximal private agricultural land is largely subject to cattle grazing in the north and west, and a variety of more intensive land uses on the Hunter River floodplain to the east (including dairy farming and irrigated cropping).The MPO Biodiversity Management Plan includes the management of grazing and agriculture: *Grazing, cultivation and routine agricultural management activities may be undertaken on MACH Energy owned land by MACH Energy or other parties with prior approval (e.g. under licence). Grazing and agricultural practices will be undertaken so as to not overstock the property and to avoid overgrazing, having regard to seasonal conditions. Any grazing or agricultural activities will be undertaken on existing suitably cleared farming land, and will not involve the additional clearing of remnant native vegetation.* The text above has been added into Section 9.2.5 of the Rehabilitation Strategy.
Post Mining Land Use		
6. Staff note several commitments throughout the Rehabilitation Strategy that post mining land uses may be refined through further consultation with Council. Staff look	Various	Noted – MACH Energy will undertake consultation with MSC as part of the Mine Closure Plan over the life of the mine (i.e. generally within 5 years of cessation of mining).

Comment Received from Muswellbrook Shire Council	Relevant Section in the Rehabilitation Strategy	MACH Energy Response
forward to consultation in relation to the Mine Closure Plan once this is available.		
7. Staff note Section 4.2.1 which states 'MACH Energy would decommission and remove all Project infrastructure unless a suitable post-mining use is identified for the infrastructure in consultation with the NSW Resources Regulator and MSC'. Council has raised concerns with the State Government that, from an environmental and social perspective, the requirement to remove all on-site infrastructure may lead to several negative outcomes, including the unnecessary loss of valuable resources and assets. It is hoped that this issue will be reviewed and addressed through future State policy or guideline updates.	Section 4.2.1	Noted – MACH Energy will consider this concern. In accordance with Part B, Condition B89(n) of Development Consent SSD 10418, MACH Energy will periodically review and update the Rehabilitation Strategy at least every three years. Any changes to how this issue will be addressed through future State policy or guideline updates will be addressed in consultation with MSC and the NSW Resources Regulator in future review/update to the Rehabilitation Strategy. The Mine Closure Plan will include detail on the process that will be implemented for any retained infrastructure including risk management.
8. In relation to the post-mining land use strategy, as required under Condition B89(k) of SSD-10418, Staff are not satisfied with the level of detail provided in Section 6 of the Rehabilitation Strategy. In 2023, the Department of Regional NSW released its *Practical Guide – Post-Mining Land Use* (the Practical Guide). Section 4 of the Practical Guide specifically outlines the recommended process for identifying and planning alternative land uses for former mine sites. Whilst Staff acknowledge that mining under SSD-10418 has only recently commenced and that planning for alternate post-mining land uses may seem premature, Staff would, at a minimum, expect a clear commitment from MACH Energy that such planning will be undertaken in accordance with the Practical Guide (or its most current version).	Section 6	To address comments raised by DPHI, Section 6 has been updated to provide more information regarding how the conceptual post-mining land uses were developed during the preparation of the Mount Pleasant Optimisation Project EIS (MACH Energy, 2021) to align with regional and local strategic land use planning documents. Additionally, Section 6 has also been updated to include a commitment that the *Practical Guide – Post-Mining Land Use* (the Practical Guide) released by the Department of Regional NSW will be used as a guide and will be supported by appropriate specialist advice on a site/project-specific basis (Department of Regional NSW, 2023). Additionally, a detailed Mine Closure Plan for the MPO will be completed prior to the closure of the MPO (i.e. generally within 5 years of cessation of mining), which will provide further detail on decommissioning at MPO.
Final Void		
9. In relation to the final void, Cond B87 of SSD 10418 requires the following: *Minimise to the greatest extent practicable having regard to post-mining beneficial land uses for the size and depth.* Section 4.5 of the Rehabilitation Strategy discusses the final void; however, it does not include any commitment to consider further refinement of its size or depth. Rather, it states that design alternatives were considered during the preparation of the Environmental Impact Statement (EIS),	Section 4.5	Section 4.5 has been updated to include more detail surrounding the final void and the final void highwall stability, which was included in the Mount Pleasant Optimisation Project – Attachment 8 (Rehabilitation and Mine Closure Addendum). Section 4.5 has also been updated to note that MACH will review and assess opportunities to reduce the size and depth of the final void during the reviews of the Rehabilitation Strategy that will occur at least every three years.

Comment Received from Muswellbrook Shire Council	Relevant Section in the Rehabilitation Strategy	MACH Energy Response
and it appears that no additional refinement will be investigated. Staff are of the view that, to meet the rehabilitation objective outlined above, MACH Energy should continue to review and assess opportunities to reduce the size and depth of the final void as the project progresses. The same applies for the objective related to high wall instability risk.		
10. Staff encourage further exploration into alternative uses of the final void and any water contained within the voids as this is still an area of concern. It is assumed that some of this work will be captured in the Mine Closure Plan, and Staff look forward to being consulted during its development.	Various	Noted – MACH Energy will undertake consultation with MSC as part of the Mine Closure Plan over the life of the mine (i.e. generally within 5 years of cessation of mining).
11. In relation to potential uses of the final void outlined in Section 4.5: a) Staff are concerned that using evaporative controls for water quality could result in water quality degradation and a loss of water resources, which could impact downstream users and ecosystems. b) Staff are concerned that using a final void as a waste disposal site could lead to leachate contamination of groundwater and nearby water courses. Staff are also concerned that due to the nature of waste, this may impact the void long-term.	Section 4.5	These two points raised by MSC have only been considered by MACH Energy as potential alternative and feasible beneficial uses of the final void. The potential final void beneficial uses proposed in Section 4.5, will be subject to separate assessments and approval, and do not form part of the Project. As discussed in the Mount Pleasant Optimisation Project – Submissions Report, MACH Energy recognises that government and community stakeholders may identify final land uses that provide greater net benefits to the locality. MACH Energy would encourage and be supportive of other community and government proposals or initiatives for the use of MACH Energy land or infrastructure that can co-exist with the Project. These alternative final land uses would be subject to separate assessments and approval, and do not form part of the Project. A Mine Closure Plan would be developed for the Project in consultation with relevant regulatory authorities and community stakeholders. It is anticipated that this would include further consideration of planned post-mining uses of the final void, and would utilise additional data collected over the life of the operation to review and update final void water quality modelling to reflect post-mining uses that are proposed at that time.
12. With an increasing number of final voids being proposed across the Upper Hunter Valley, Staff are of the opinion that further work needs to occur to prevent long-term issues being passed on to future generations in the region.	Section 4.5	Noted – MACH Energy will consider this concern. In accordance with Part B, Condition B89(n) of Development Consent SSD 10418, MACH Energy will periodically review and update the Rehabilitation Strategy at least every three years (Section 7.2). Further detail on the final voids will also be included in the detailed Mine Closure Plan (i.e. generally within 5 years of cessation of mining).

Comment Received from Muswellbrook Shire Council	Relevant Section in the Rehabilitation Strategy	MACH Energy Response
		Any changes to how this issue will be addressed will be undertaken in consultation with MSC and the NSW Resources Regulator.
Final Landform		
13. Section 4.2.4 of the Rehabilitation Strategy states 'MACH Energy has incorporated significant areas of the outer emplacement batters at slopes of less than 10 degrees (lower slopes), and more limited areas of slopes up to approximately 14 degrees (upper slopes)…. MACH Energy will continue to refine the design of the proposed final landform, and where relevant, will justify areas to be constructed at steep grades (including slopes greater than 14 degrees)'. Section 5.2.1 of 'EIS Attachment 8 – Rehabilitation and Mine Closure Addendum' (the Addendum) notes that 'there are some areas where the slopes are up to 33% (18 degrees) but this only represents a small proportion of the total surface area of the final landform'. Figure 6 of the Addendum provides an example of the final landform slope analysis to support this statement. Staff consider that there may be merit in including the slope analysis within the Rehabilitation Strategy to provide greater clarity and support for the proposed final landform design.	Section 4.2.4	In response to MSC comments, MACH Energy has included *Figure 6 - Example Conceptual Final Landform C Slope Analysis* from the Mount Pleasant Optimisation Project Attachment 8 – Rehabilitation and Mine Closure Addendum as an attachment to the revised Rehabilitation Strategy (SSD 10418).

From: Giselle Carney <giselle.carney@regional.nsw.gov.au>
Sent: Thursday, 26 June 2025 9:42 AM
To: Lisa Richards <lisa.richards@machenergy.com.au>
Cc: Chris Lauritzen <Chris.Lauritzen@machenergy.com.au>; Natalia Gallo <natalia.gallo@regional.nsw.gov.au>
Subject: Major Project Portal consultation

Morning Lisa,

We received the attached email sent to the resources regulator.

We did receive a portal request directly from MACH in February 2025, the request was withdrawn, see attached requests.

Major Projects Technical Support are incorrect, we do not receive these consultations through direct emails, they need to come through the portal. Could you please resubmit and we can process.

Please reach out with any questions, let me know if you'd like me to call, thank you

Giselle Carney
A/Manager
Industry Advisory and Mining Concierge | NSW Resources
Department of Primary Industries and Regional Development

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dpird.nsw.gov.au

Parramatta

Department of Primary Industries and Regional Development

From:	info@sys.resources.nsw.gov.au on behalf of NSW Resources
To:	Lisa Richards
Cc:	catherine.lewis@regional.nsw.gov.au
Subject:	AREQ0064355 | MPO - Rehabilitation Strategy (SSD 104148) - NSW RR Consultation
Date:	Wednesday, 16 July 2025 11:31:00 AM
Attachments:	image image image image

Dear Lisa,

I refer to your email dated 30 May 2025 requesting the Resources Regulator's comments on the Rehabilitation Strategy for Mount Pleasant Coal Mine. My apologies for the delayed response.

The Regulator has no specific comments on the document, however, you are reminded that you will need to ensure that key documents required under Schedule 8A are updated where required. Specifically, the following:

- Rehabilitation Management Plan under cluse 10 - specifically the Life of Mine rehabilitation schedule in Part 6.1
- Final Landform and Rehabilitation Plan and Rehabilitation Objective Statement under clause 12

If you have any questions, please don't hesitate to call.

Regards,

Matthew Newton
Principal Inspector Environment & Rehab
MAI - Strategy Advise and Programs | Resources Regulator
T 0249316745 M 0418739611

The Department of Primary Industries and Regional Development acknowledges that it stands on Country which always was and always will be Aboriginal land. We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally and economically through thoughtful and collaborative approaches to our work.

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