ENERGYAUSTRALIA NSW
Pine Dale Mine

Rehabilitation Management Plan 2022

July 2022

Version 001

This report may be cited as:

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Acknowledgements

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Document History and Status

Revision	Date Issued	Reviewed By	Approved By	Date Approved	Revision Type
Draft for Consultation	13.05.2022	Ben Eastwood (EnergyAustralia)			Version 1.0
Final	July 2022	Energy Australia			Version 1.1

Summary Table

NAME OF MINE	PINE DALE MINE	
REHABILITATION MANAGEMENT PLAN COMMENCEMENT DATE	1 JULY 2022	
REHABILITATION MANAGEMENT PLAN REVISION DATES AND VERSION NUMBERS	VERSION 1.1	
MINING LEASES	**NO**	**Expiry**
	ML 1664	9/01/2033
	ML 1569	11/12/2024
	ML 1578	14/03/2027
	ML 1637	11/12/2024
NAME OF LEASE HOLDER(S)	ENHANCE PLACE PTY LTD	
DATE OF SUBMISSION	JULY 2022	

1. Introduction

Please note relevant sections of the *Form and Way: Rehabilitation management plan for large mines* (2 July 2021) from the NSW Resources Regulator have been included in this Rehabilitation Management Plan (RMP) in blue text for clear reference to requirements.

This section must provide a brief history of significant surface disturbance activities, including mining operations, ancillary mining activities and exploration, carried out on the mining area to give adequate context to the rehabilitation management plan. This must:

a. identify the mine operator and proprietors (if different to the details of the lease holders identified in the summary table)

b. briefly summarise significant surface disturbing activities, including mining operations, ancillary mining activities and exploration, carried out on the mining area

c. briefly summarise rehabilitation undertaken since commencement of mining operations including decommissioning or demolition of built infrastructure

d. state the approved life of the mine date as per the relevant development consent.

Pine Dale Mine (Pine Dale) is operated by Enhance Place Pty Ltd (Enhance Place), which is owned by EnergyAustralia. On 1 March 2011, EnergyAustralia acquired the Gentrader rights to the Mt. Piper and Wallerawang Power Stations and took ownership and responsibility of Pine Dale on 1 June 2012. Pine Dale is located 16 kilometres (km) north of Lithgow in the Western Coalfields in New South Wales (NSW). The site is approximately 3km from the Mt. Piper Power Station (MPPS) and immediately across the highway from the Springvale Joint Venture Coal Preparation and Handling Facility.

Pine Dale is currently in care and maintenance, having exhausted all accessible coal within the approved mining area. Enhance Place has applied to NSW for a suspension of its mining operations at Pine Dale under Section 70(1)(a) of the Mining Act 1992 NSW (Mining Act).

1.1. History of Operations

The southern and western parts of Pine Dale are associated with historical coal mining activities from the former Wallerawang and Commonwealth Collieries. Wallerawang Collieries commenced underground mining operations in 1910 and closed in 1987 due to depletion of underground coal reserves.

1.1.1. Wallerawang Colliery

Wallerawang Colliery also operated two small open cut operations. The first open cut was operated for approximately 2 years up until 1954 and a second smaller operation was undertaken for approximately the same period up until 1969. Both open cut operations are located in an area referred to as the Wallerawang Colliery Pit Top which is partially locate in the western part of the Pine Dale and Yarraboldy Extension area.

Rehabilitation and demolition started between 1987 and 1991. During this time, surface infrastructure including the washery and conveyors were removed. Shafts and adits were reportedly sealed. Approximately 20 hectares was rehabilitated in 1991, although it was largely unsuccessful as coarse reject from washing operations were left on the surface and capped with only 0.1m of clay prior to seeding. The surface acidified causing vegetation dieback, which resulted in bare areas susceptible to erosion.

In 1994 the bathhouse and office blocks were removed. A program to remove approximately 150,000t of coal fines, mostly located in the Wallerawang Open Cut, also commenced. Discharge, water quality controls, fertilisation and noxious weed control programs were maintained during this time. In 1999 the coal fines recovery program expanded with the commencement of a briquette operation which was subcontracted to Yarraboldy Briquette Company Pty Ltd. This operation continued until 2006.

1.1.2. Commonwealth Colliery

The Commonwealth Colliery operations included two open cut mines which were the Commonwealth Open Cut and the Commonwealth Extended Open Cut. Following the cessation of mining operations at Commonwealth Open Cut, the void filled with water to form a lake now known as Blue Lake. Blue Lake is located at the confluence of Coxs River and Neubecks Creek.

Commonwealth Extended Open Cut operated in the late 1940s – 1950s in an area approximately 16 hectares west of Blue Lake. In 1975 the void from the Commonwealth Extended Open Cut became the main site for the disposal of washery reject (chitter) from the Wallerawang Colliery washery. An estimated 1 million tonnes (Mt) of reject were placed in the Commonwealth Extended Open Cut void. In the 1990s, the surface of the void was re-profiled and covered with clay and vegetated with pasture grasses.

1.1.3. Original Pine Dale Mine

Pine Dale commenced operations in early 2006 and exhausted its approved coal resources in December 2010. Some of the mining area has been rehabilitated with a few rehabilitation activities still to be undertaken including the highway and open pit area.

1.1.4. Pine Dale Mine – Yarraboldy Extension

The Yarraboldy Open Cut Mine is part of the former Wallerawang Colliery. Operations are within the approved project area under Project Approval 10_0041 as part of the Pine Dale Mine – Yarraboldy Extension. The Project Approval granted permission to carry out mining operations until 31 December 2014. There is no limit on when other activities e.g. Rehabilitation or care and maintenance within the Project Approval must be completed.

1.1.5. Summary of Rehabilitation to Date

A Rehabilitation Monitoring Report is completed annually and attached to the AEMR.

Areas of privately owned land within PDM (Area B, C & 8) have been returned to pasture for agricultural purposes, including grazing, as per the approved rehabilitation strategy and landholder preferences. To date there has been 25.4 hectares of completed rehabilitation and 7 hectares of active rehabilitation.

The rehabilitation report includes a survey of six (6) previously established monitoring transects: four (4) transects are located within rehabilitated pastures and two (2) transects are within treed rehabilitation areas. An additional two (2) transects exist as analogue sites in grazed pasture and undisturbed naturally vegetative areas to provide benchmarks against the pasture and treed rehabilitation areas.

1.2. Current Development Consents, Leases and Licences

This section must show (in a table) the date of grant and duration of the following, with respect to the mining area:

a. development consents granted under the *Environmental Planning and Assessment Act 1979*

b. authorisations covering the mining area (including exploration licences, assessment leases and mining leases) granted under the *Mining Act 1992*

c. any other approvals, licences, or authorities issued by Government agencies that are relevant to the progress of mining operation and rehabilitation activities.

Under Part 4 of the *Environmental Planning and Assessment Act 1979 (EP&A Act*), Pine Dale Mine is an approved State Significant Development (SSD). As the site is currently in care and maintenance, there are no further additional consents, leases or licenses required to manage the site. However, a new planning approval, EPL and other relevant licenses will be required if mining recommences in the future. The following table details the current consents, authorisations and licences applicable to Pine Dale.

Table 1 – Consents, Authorisations and Licences

Approval	Description	Consent Authority	Date Granted	Expiry Date
Project Approval 10_0041	Pine Dale Mine – Yarraboldy Extension A modification to PA 10_0041 was made in March 2012.	Minister for Planning	20 Feb 2011	Mining to 31 Dec 2014 No end date to approval.
Referral Decision (2011/6016)	Expand existing Pine Dale Coal mine through open cut mining (Yarraboldy extension), 16 kilometres northwest of Lithgow, NSW.	Department of Sustainability, Environment, Water, Population and Communities	20 Oct 2011	Not Applicable
Environment Protection Licence 4911	Environment Protection Licence	NSW Environment Protection Authority	Anniversary Date 24 Nov	Not Applicable
Mining Lease 1578	Mining Lease	The Minister for Mineral Resources	15 Mar 2006	14 Mar 2027
Mining Lease 1569	Mining Lease	The Minister for Mineral Resources	4 Jul 2007	11 Dec 2024
Mining Lease 1664	Mining Lease	Minister for Resources and Energy	10 Jan 2012	9 Jan 2033
Mining Lease 1637	Mining Lease	Minister for Resources and Energy	18 Jun 2012	11 Dec 2024

Approval	Description	Consent Authority	Date Granted	Expiry Date
Exploration Licence 7621	Exploration Licence	Department of Resources and Geoscience	1 Oct 2010	1 Oct 2024
10BL165933	Bore Licence	Water NSW	22 Dec 2005	Not Applicable
10BL604181	Bore Licence	Water NSW	23 Nov 2010	Not Applicable
WAL36480 (approval no 10WA118780)	Water Access Licence	Water NSW	1 July 2003	30 June 2026
10CW801601	Flood Control Works Licence	Department of Planning, Industry and Environment	23 Dec 2005	Not Applicable

1.3. Land ownership and land use

This section must provide an overview (in a table) of the land tenure of the general area (i.e. land tenure of lots within and adjacent to mining leases) as well as a schedule of land ownership, occupancy, and leases over the mining lease area consistent with the land ownership and land use figure (refer to section 1.3.1).

All land tenures must be correctly identified (e.g. freehold, vacant crown land, western lands lease, travelling stock reserves). All private freehold land must be labelled without identifying the individual landowners.

This section must also provide a summary of the known historic land uses, current land uses and proposed final land uses. This section must include information about any stewardship agreement, conservation agreement or other similar agreements specific to mining lease areas.

Land in the project area is mostly either owned by Enhance Place, is Crowned Land within the Bullen State Forest, or is privately owned. The Bullen State Forest is managed by Forestry Corporation NSW. Land ownership and land use is shown on **Figure 1A** and **Figure 1B** which are presented in **Appendix 2**.

2. FINAL LAND USE

2.1. Regulatory Requirements for Rehabilitation

This section must list, in a table, all the regulatory requirements for rehabilitation that apply to the mining area. This must include, but is not limited to:

a. conditions of development consent(s), including the commitments in the associated environmental assessments (such as the Environmental Impact Statement and accompanying appendices approved as part of the development consent)3

b. mining lease conditions

c. other relevant legislation (for example *Biodiversity Conservation Act 2016*, *Heritage Act 1977*)

d. any other relevant government approvals, permits, policies and guidelines.

The table must specify whether each requirement applies to the entire site or to a specific domain (refer to section 2.5) or a defined parcel of land, as well as the timing to meet each requirement and the relevant section of the rehabilitation management plan that addresses each requirement.

Regulatory requirements for rehabilitation at Pine Dale include all relevant commitments defined in the conditions of the Project Approval (PA 10_0041), Statement of Commitments, Mining Leases, relevant state and Commonwealth legislation and any relevant government approvals, permits and guidelines.

Table 2 details the commitments defined in site specific approvals that are relevant to the rehabilitation and closure of the Pine Dale mine site. For understanding of commitments in the table below, it should be noted that Wangcol Creek was previously known as Neubeck's Creek.

Table 2 – Regulatory Requirements Relating to Rehabilitation

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
PA 10_0041	Schedule 3 Condition 53	The proponent shall rehabilitate the site to the satisfaction of the Executive Director, Mineral Resources in DPE-RG. This rehabilitation must be generally consistent with the proposed rehabilitation strategy described in the EA, however the area to be returned to native woodland and forests vegetation (i.e. Class VII land which is consistent with surrounding State Forest lands) must be increased to cover the area marked with cross-hatching on the figure in Appendix 3, to the satisfaction of the Executive Director, Mineral Resources in DPE-RG.	Whole Site	Prior to final closure.	Noted. See **Section 6** for rehabilitation details. See figures in the RMP.
PA 10_0041	Schedule 3 Condition 54	The Proponent shall carry out the rehabilitation of the site progressively, that is, as soon as reasonably practicable following disturbance.	Whole Site	Progressive when possible	Noted. Progressive rehabilitation was previously completed. Active areas now required to be maintained if operations recommence.
PA 10_0041	Schedule 3 Condition 54	The Proponent shall prepare and implement a Rehabilitation Management Plan for the Project to the satisfaction of the Executive Director, Mineral Resources in DPE-RG. This plan must: a) be prepared in consultation with the Department, OEH, NOW and the CCC; b) Be prepared in accordance with any relevant DPE-RG guideline; and c) Build, to the maximum extent possible, on the other management plans required under this approval d) be submitted to the Executive Director, Mineral Resources in DRE for approval by the end of July 2011.	Whole Site	Already completed. However requirements included in this document	a) Draft copy of the RMP provided to these agencies. Discussed at the CCC at the next meeting. See **Section 4.2** b) Completed to the RMP Form and Way Document requirements. c) Outlines risks during operations. However other management plans are still in place. d) Timing now not applicable. However 2022 RMP has been submitted to the Resources Regulator.
Statement of Commitments: Surface Water	2.5	Establish and maintain groundcover at 70% or better over areas disturbed and no longer required by the Project and as site conditions provide for practicability.	Whole Site	Prior to final closure.	Noted. See **Section 6** for rehabilitation details. See figures in the RMP.

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
				Disturbance is still required.	
Statement of Commitments: Surface Water	2.6	Progressively rehabilitate disturbed areas no longer required by the Project soon after the cessation of mining activities.	Whole Site	Ongoing. Disturbance is still required. No proposed progressive rehabilitation over next three years.	Noted. See **Section 6** for rehabilitation details. See figures in the RMP
Statement of Commitments: Flora	3.3	Utilise local native plant species and shrubs for rehabilitation and landscaping.	Whole Site	During rehabilitation	Section 6.2.5
Statement of Commitments: Flora	3.4	Undertake replacement planting of some of the same tree species and shrubs within the Project Site upon cessation of mining activities.	Whole Site	During rehabilitation	Section 6.2.5/6.2.6
Statement of Commitments: Flora	3.5	Retain suitable bush rock with the topsoil and respread during the rehabilitation phase to return groundcover to near-original state.	Whole Site	During rehabilitation	Section 6.2.5/6.2.6
Statement of Commitments: Fauna	4.4	Provide habitat for important target species such as the Purple copper butterfly through planting of appropriate flora species (e.g. *Bursaria spinosa spp lasiophylla*).	Whole Site	During rehabilitation	Section 6.2.5/6.2.6
Statement of Commitments: Fauna	4.5	Progressively increase forest and woodland communities within the already disturbed areas, the coaly residue areas and the rehabilitated land, to provide foraging and sheltering habitat.	Whole Site	During rehabilitation	Section 6.2.5/6.2.6
Statement of Commitments: Fauna	4.6	Use nesting boxes if required and salvage hollows to assist in maintaining the short and long term habitat value for hollow dependent species.	Rehabilitation areas	Required as part of final woodland closure areas.	Section 6.2.5/6.2.6
ML 1569	Schedule 2 Condition 1	Mining operations, including mining purposes, must be conducted in accordance with a Mining Operations Plan (the Plan) satisfactory to the Director-General. The plan together with environmental conditions of development consent and other approvals will form the basis for : - *a)* Ongoing mining operations and environmental management;	-	-	Now replaced by RMP

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
		b) Ongoing Monitoring of the project.			
ML 1569	Schedule 2 Condition 2	The plan must be prepared in accordance with the Director General's guidelines current at the time of lodgment.	-	-	
ML 1569	Schedule 2 Condition 3	A Plan must be lodged with the Director General: - *a)* (i) Prior to the commencement of rehabilitation or other works, with the exception of the continuing Yarraboldy Briquette Company Pty Ltd operations, or (ii) Within sixty (60) days from the 'effective date' of the renewal of this authority. Whichever date is the sooner. *b)* Subsequently as appropriate prior to the expiry of any current Plan; and In accordance with any direction issued by the Director-General.	-	-	
ML 1569	Schedule 2 Condition 4	The Plan must present a schedule of proposed mine development for a period of up to seven (7) years and contain diagrams and documentation which identify: - *a)* Area(s) proposed to be disturbed under the Plan; *b)* Mining and rehabilitation method(s) to be used and their sequence; *c)* Areas to be used for disposal of tailings/waste; *d)* Existing and proposed surface infrastructure; *e)* Progressive rehabilitation schedules; *f)* Areas of particular environmental sensitivity; *g)* Water management systems (including erosion and sediment controls); *h)* Proposed resource recovery; and *i)* Where the mine cease extraction during the term of the Plan, a closure plan including final rehabilitation objectives/methods and post mining land use/vegetation.	-	-	
ML 1569	Schedule 2 Condition 5	The plan when lodged will be reviewed by the Department of Mineral Resources.	-	-	Now replaced by RMP
ML 1569	Schedule 2 Condition 6	The Director General may within two (2) months of the lodgment of a Plan, require modification and re-lodgment.	-	-	
ML 1569	Schedule 2 Condition 7	If a requirement in accordance with clause (6) is not issued within two months of the lodgment of a Plan, lease holder may proceed with implementation of the Plan submitted subject to the lodgment	-	-	

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
		of the required security deposit within the specified time.			
ML 1569	Schedule 2 Condition 8	During the life of the Mining Operations Plan, proposed modifications to the Plan must be lodged with the Director-General and will be subject to the review process outlined in clauses (5) – (7) above.	-	-	
ML 1569	Schedule 2 Condition 9	In addition to the content required by clauses (1) to (8) above, the Mining Operation Plan must also include the following information: i) Details and timeframes for any impacts on the amenity of residents in the vicinity of the site.	-	-	Now replaced by RMP
		ii) A Rehabilitation Plan for this authority must be included as part of the Mining Operation Plan. This Rehabilitation Plan must detail rehabilitation measures for all areas of this authority which have been degraded by mining activities.	-	-	
		iii) The Rehabilitation Plan must fully address the issue of acid rock drainage (ARD) and provide means to ameliorate its impact on this authority and Neubecks Creek. This includes a detailed assessment of the site materials and the efficacy of any proposed encapsulation strategies. Appropriate monitoring and control mechanisms should be implemented to ensure surficial caps are installed to a thickness of not less than 250 mm and compacted to maximise runoff and limit erosion.	-	-	
		iv) The Rehabilitation Plan shall include a detailed surface and groundwater management plan incorporating erosion and sediment control measures for the entire site. This Rehabilitation Plan shall contain details on all surface drainage controls and structures, their design, installation and maintenance to effectively manage and 15tilizin erosion. The Rehabilitation Plan shall also include details on water monitoring for key locations on the site.	-	-	
		v) The rehabilitation Plan shall include a specific plan identifying detailed rehabilitation measures for the entire length of Neubecks Creek where it passes through this authority, excluding areas intended to be disturbed as part of the Pine	-	-	Section 6.2.6.3

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
		Dale operation. This Plan must include a detailed description of the methods and materials to be used to enable the rehabilitation and maintenance of the Creek (based on the site- specific consideration of soil types, landform, vegetation etc..) The Planning and design of the watercourse should be, in both concept and design detail, consistent with the River and Estuaries Policy; NSW Wetlands Management Policy; Australian Stream Management Manual [LWRRDC]; and NSW Biodiversity Strategy.			
		vi) The Rehabilitation Plan should clearly identify the intended final land use(s) for the rehabilitated areas of this authority.	-	-	
		vii) The Rehabilitation Plan shall include a detailed revegetation plan consistent with the final land use. The Rehabilitation Plan should identify the type and location of grasses, ground covers, shrubs and trees to be planted. Where possible, preference should be given to local endemic species grown from seed. The Rehabilitation Plan should provide for progressive revegetation and for revegetation to occur promptly after completion of earthworks. This Rehabilitation Plan shall also include proposed measures to control weeds and grazing.	-	-	Now replaced by RMP
		viii) The Rehabilitation Plan shall include a detailed costing and timetable for all works.	-	-	Covered by Rehabilitation Bond.
ML 1569	Schedule 2 Condition 10	Development of the site Post Rehabilitation Management and Maintenance Plan is required that details management strategies which ensure the site is managed and maintained in an appropriate condition consistent with rehabilitation aims. This plan shall provide information on actions proposed to control weeds, ensure survival of vegetation, maintain drainage and sediment control structures and minimising grazing impacts. This Plan must be provided to the Department within twelve (12) months from the 'effective date' of the renewal of this authority and will be considered to form an addendum to the Mining Operation Plan.	-	-	Now replaced by RMP

Document	Condition	Requirement in Approvals	Area	Timing	Section Addressed
ML 1569	Schedule 2 Condition 11	Approval must be sought from the Director-General and other relevant government agencies prior to the importation of significant quantities of rehabilitation materials (such as 'green product', 'wood based soil conditioner', 'compost' or 'power station ash'). Materials sourced from within the site should be used wherever possible.	-	-	Now replaced by RMP
ML 1569	Schedule 2 Condition 12	Community consultation in respect of the proposed rehabilitation works should be undertaken with landowners in the Blackmans Flat area prior to the commencement of rehabilitation works.	-	-	Now replaced by RMP. This will be required prior to recommencing activities.

2.2. Final Land Use Options Assessment

This lease holder must conduct a final land use options assessment and detail the findings in this section. The final land use options assessment must:

a. consider and be consistent with any applicable conditions of the mining lease

b. consider and be consistent with any applicable conditions of a development consent

c. consider and be consistent with the permissible land uses and land zonings set out in any applicable local, regional or state environmental planning instruments

d. be informed by consultation with relevant stakeholders, including the NSW Resources Regulator, the local council, other government agencies, land holders and local Aboriginal Land Councils

e. include a detailed summary table of the consultation undertaken for the final land use options assessment which must identify:

- each relevant stakeholder
- the consultation activities and method of consultation
- the matters subject to consultation
- the outcomes of consultation in relation to the final land use.

f. consider the proposed final land use options

g. identify and justify the proposed final land use.

The outcomes of the options assessment must support the suitability of the proposed final land use.

This section is not applicable due to final land use already being determined through existing project approval process and the previous MOP.

See **Section 2.4** of the RMP for details on final land use domains.

2.3. Final Land Use Statement

This section must state the final land use(s) for the mining area. The final land use statement must:

- be consistent with any approved final land use described in the relevant development consent(s)
- reflect the outcomes of a final land use options assessment (section 2.2) (if applicable).

The final land use is outlined in **Section 2.4** Final Landform Figure and are outlined in **Section 2.4.1.**

2.4. Final Land Use and Mining Domains

2.4.1. Final land use Domains

This section must define and list the final land use domain(s) for all areas within the lease as illustrated in the final landform and rehabilitation plan in accordance with Section 5.

Domains are used to divide a mine site into small, more manageable areas. They are usually determined based on the consideration of specific requirements of the mining location and local environment.

The NSW Resources Regulator has provided a list of Final Land Use and Mining domain names and codes that must be adhered to when preparing the new RMPs. **Table 3** details the specific domain titles and the relevant codes.

Table 3 – NSW Resource Regulator Domain Codes (2021)

Final Land Use Domain	Code	Mining Domain	Code
Native Ecosystem	**A**	**Infrastructure Area**	**1**
Agriculture – Grazing	**B**	Tailings Storage Facility	2
Agriculture – Cropping	C	**Water Management Area**	**3**
Rehabilitation Biodiversity Offset Area	D	**Overburden Emplacement Area**	**4**
Industrial	E	**Active Mining Area (Open cut Void)**	**5**
Water Management Areas	**F**	Underground Mining Area (SMP)	6
Water Storage (Excluding Final Void)	**G**	Beneficiation Facility	7
Heritage Area	H	Other	8
Infrastructure	**I**		
Final Void	J		
Other (Existing Pine Plantation) ***#added to be consistent with former Domain E from last MOP.***	**K**		

The domains in bold are the ones relevant to Pine Dale, while the ones in grey are not applicable to the site. The 'Other' under Final Land Use refers to the Pine Plantation. **Table 4** describes the Final Land Use Domains applicable to Pine Dale. A brief description of each Final Land use and Mining domain at Pine Dale is provided in **Sections 2.4.1** and **2.4.2** respectively.

Table 4 – Final Land Use Domains

RR Code	Final Land Use Domain	Description
A	Native Ecosystem (Forest)	Areas disturbed by mining rehabilitated with native vegetation including species representative of Stringybark – Scribbly Gum Forest.
B	Agriculture – Grazing	Areas disturbed by mining rehabilitated with exotic and native pasture species.
F	Water Management Areas	The network of water management structures retained in the final landform including clean water dams, banks and channels. This includes Wangcol Creek (formerly known as Neubecks Creek) that runs through the site.
G	Water Storage (Excluding Final Void)	Includes dams retained for the final land use.
I	Infrastructure	For Pine Dale the main haul road will remain in place, however it will be partially rehabilitated so it is a single vehicle road. There will also be some fences remaining as well as water management infrastructure.
K	Other (Pine Plantation)	Existing Pine Plantation. This will remain at closure.

2.4.2. Mining Domains

This section must describe the mining domain(s) for all operational/disturbance areas within the mining area site as illustrated in the final landform and rehabilitation plan in accordance with Section 5.

Table 5 provides further detail on the applicable Mining Domains as per the Resources Regulator coding.

Table 5 – Mining Domains

RR Code	Mining Domain	Description
1	Infrastructure Area	Footprint of infrastructure areas including, haul roads, administration buildings, the workshop and crushing facility and hardstands.
3	Water Management Areas	Footprint of the major water management structures (including sediment dams, diversion channels and banks).
4	Overburden Emplacement Area	Footprint of in-pit and out of pit waste rock emplacements including the temporary amenity bund.

RR Code	Mining Domain	Description
		Note much of the area that is classified as overburden, with bulk earth moving required at closure.
5	Active Mining Area (Open Cut Void)	This domain comprises the footprint of the extraction area not yet backfilled with overburden. Includes highwall, low walls and ramps.

3. REHABILITATION RISK ASSESSMENT

This part of the rehabilitation management plan must present in a table:

a. a summary of rehabilitation risk assessments conducted by the lease holder (eg. Date, what happened)

b. a list of the risks to rehabilitation identified in the most recent rehabilitation risk assessment undertaken in accordance with Clause 7 of Schedule 8A, to the Mining Regulation 2016

c. how each identified risk and associated risk controls (refer to definition in the glossary) have been addressed in this rehabilitation management plan.

A Rehabilitation Risk Assessment was completed on 23/11/2021 and included the following personnel:

- Chris Jones – IEMA (Principal Environmental Scientist);
- Edwina White – Approvals and Licensing Specialist – Mt Piper (no longer with EnergyAustralia);
- Ben Eastwood – NSW Environment Team Leader – Mt Piper; and
- Graham Goodwin – Mine Manager.

The objective of the risk assessment was to identify and risk assess the identified rehabilitation and closure risks for the site, in accordance with:

- Rehabilitation Risk Assessment Guideline (NSW Resources Regulator, 2021); and
- AS/NZS ISO 31000:2018 Risk management Guidelines; and list risk mitigation actions to reduce the risks.

The Rehabilitation Risk Assessment template has been prepared with colour coding. The colour coding relates to the source of a risk, and includes:

Green = RMP Form and Way Document
Grey = Risk from Resources Regulator Risk Guideline
Cream = Risk from TAP guidance
Red = Added as part of this specific RA

A summary of the risks classified as medium are outlined in the table below. There were no risks classified as high.

Appendix 1 outlines the Rehabilitation Risk Assessment.

Table 6 – Rehabilitation Risk Assessment Summary (Medium Risks)

Risk ID	Risk to Rehabilitation	Risk Control	Current Risk Rating	Treatment Plan	Where Addressed in RMP
6	Limited rock/overburden resulting in a materials deficit for rehabilitation.	1. General material balance, however it is not detailed. 2. There are areas of overburden and the visual bund could be reshaped for rehabilitation.	**8 (M)**	**Treatment Plan 2** Review material balance as part of the Final Closure Plan. Implement changes based on this process.	6.2.1 d. Rock/Overburden Emplacement
8	Adverse geochemical/chemical composition of materials such as overburden, interburden, processing wastes, subsoils and topsoils and imported cover materials.	1. Soil analysis meets requirements in existing rehab areas 2. 2014 Soil Assessment and Recommendations for Rehabilitation Report.	**8 (M)**	**Treatment Plan 3** Additional soil and overburden testing required for any future rehabilitation areas. Include PAF and NAF testing. To be completed as part of Final Closure Plan.	6.2.1 f. Geology and Geochemistry
25	Less than adequate landform design (e.g. Slopes not as per the Project Approval).	1. Engineering design and quality assurance on future rehabilitation. 2. Slopes, geotechnical and stability assessment required to be included in Final Closure Plan	**8 (M)**	**Treatment Plan 11** Slopes and stability to be assessed as part of the final Closure Plan.	6.2.3 b. Final landform construction: general requirements
26	Vegetation mix in final landform is different to the Project Approval	1. RMP is being updated.	**8 (M)**	**Treatment Plan 12** Seek advice from a rehabilitation specialist in regards to the most suitable species mix for any future rehabilitation. Confirm revegetation plan with regulators as part of closure planning.	6.2.3 b. Final landform construction: general requirements
35	Subsoil and topsoil deficit during rehabilitation activities.	1. Minimal topsoil therefore ameliorants would need to be used.	**12 (M)**	**Treatment Plan 14** Final Closure Plan to look at reviewing subsoil and soil depth, as well as criteria. From RR 'Rehabilitation Controls' Guideline'. Final Closure Plan needs to look at alternatives for topsoil use.	Section 6.2.4 Growth Medium Development
47	Criteria are not realistic to meet	1. Existing criteria. 2. Have met criteria in some parts of the site	**8 (M)**	**Treatment Plan 16** All completion criteria to be assessed in the Final Closure Plan.	6.2.6. Ecosystem and land use development

Risk ID	Risk to Rehabilitation	Risk Control	Current Risk Rating	Treatment Plan	Where Addressed in RMP
48	Limited vegetation structural development and habitat for targeted fauna species.	1. Inspections and monitoring. 2. Incorporation during earlier phases of rehabilitation. 3. Use of nest boxes in the future.	**8 (M)**		6.2.6. Ecosystem and land use development

4. REHABILITATION OBJECTIVES AND REHABILITATION COMPLETION CRITERIA

4.1. Rehabilitation Objectives and Rehabilitation Completion Criteria

This section must list in a table:

a. Specific final land use domain(s) and associated spatial reference.

b. Specific mining domain(s) and associated spatial reference.

c. Specific rehabilitation objectives for each final land use domain and associated mining domain that have been approved by the NSW Resources Regulator. Where rehabilitation objectives have been approved by the NSW Resources Regulator, they are to be listed as "approved rehabilitation objectives". Where they have not been approved, they are to be listed as "proposed rehabilitation objectives".

d. The specific indicator(s) (e.g. specific attribute associated with the rehabilitation objective) that will be measured/monitored.

e. Specific rehabilitation completion criteria (benchmark for the indicator(s)) for each rehabilitation objective. Where rehabilitation completion criteria have been approved by the NSW Resources Regulator they are to be listed as "approved rehabilitation completion criteria". Where they have not been approved (e.g. because they require further refinement), they are to be listed as "proposed rehabilitation completion criteria".

f. The validation method (e.g. monitoring event or record) to demonstrate that each criterion has been achieved.

The rehabilitation objectives and rehabilitation completion criteria required by this section must:

a. be consistent with any relevant rehabilitation objectives approved under a development consent

b. be consistent with any final land use(s) approved under a relevant development consent or any final land use statement (refer to Section 2.3).

Table 7 outlines the Rehabilitation Objectives and Criteria as per requirements a) – f) from the RMP Form and Way Document. It is noted that criteria are no longer separated by rehabilitation phase and an additional column has been added for validation method to be consistent with the requirements of the RMP Form and Way Document.

Table 7 – Rehabilitation Objectives and Completion Criteria

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
Domain A – Native Ecosystem Domain B – Agriculture–- Grazing	Domain 1–- Infrastructure Area	All non-heritage infrastructure will be removed prior to closure.	Services removed	removal of mining related services as agreed.	Site waste and demolition records prior to closure (including photographs).
			Buildings removed	removal of mining related buildings as agreed.	
			Footings, pads and pavements	concrete footings and foundation pads, bituminous and concrete pavements have been removed as agreed.	
		All hazardous and contaminated materials are identified and removed or appropriately remediated.	Contamination assessment	A contamination assessment has been completed for the workshop, fuel and chemical stores, crushing and stockpiling facility.	Contamination report prepared by qualified person. Included in Final Closure Plan.
			Contamination	Identified contamination has been removed or appropriately remediated in-situ.	Contamination report prepared by qualified person. Included in Final Closure Plan.
			Hazardous materials	Hazardous materials are identified and removed to appropriate standards.	Hazardous substances assessment prepared by qualified person. Included in Final Closure Plan.
			Coaliferous materials	All coaliferous material has been removed from the crushing and stockpiling facility and private haul road.	Visual inspections and photographs to be included in relinquishment report.

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
					Details included in Final Closure Plan.
Domain A – Native Ecosystem Domain B – Agriculture–- Grazing	Domain 4–- Overburden Emplacement	Post mining landforms will be geotechnically stable, free draining and non-polluting. A safe and stable landform supportive of the final land use.	Presence of spontaneous combustion.	No areas of spontaneous combustion detected.	Details included in Final Closure Plan.
			Discharge water quality	Discharge water quality meets EPL standard.	Details included in Final Closure Plan. Historical water quality testing. Water quality testing until lease is relinquished.
			Potentially acid forming (PAF) materials.	Suspected Potentially Acid Forming (PAF) materials are capped with at least 5m of inert overburden in any new rehabilitated areas.	Details included in Final Closure Plan.
				Shaley interburden is capped with at least 2m of inert overburden in any new rehabilitation areas.	Details included in Final Closure Plan.
Domain F – Water Management Area Domain G – Water Storage	Domain 3 Water Management Area	Water management infrastructure not required in the final landform is removed from site.	Operational water infrastructure	Removal of dirty water management infrastructure including pipes, pumps, sediment dams and ancillary equipment.	Details included in Final Closure Plan. List of infrastructure removed and demolition location. Photographs of removed items.

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
(Excluding Final Void)			Dirt water dams	Dirty water dams not retained for future land use are drained and the water disposed of in accordance with the EPL.	Details included in Final Closure Plan. Engineering/water management assessment of remaining structures. *Note, most dams remain at closure.*
Domain G – Water Storage (Excluding Final Void)	Domain 3 Water Management Area	Post mining landforms will be geotechnically stable, free draining and non-polluting.	Discharge water quality	Dirty water is captured and discharged in accordance with the EPL.	Details included in Final Closure Plan. Historical water quality testing. Water quality testing until lease is relinquished.
Domain A – Native Ecosystem Domain B – Agriculture–- Grazing	Domain 4 Overburden Emplacement	Overburden emplacements will be shaped to generally reconstruct the pre-mining landform where possible.	Landform integration	Post mining landforms are compatible with adjacent undisturbed landforms.	Copy of the Slopes, geotechnical and stability assessment required for the Final Closure Plan. Photographs and records of execution (engineering check).
		Temporary amenity bunds will be re-graded to blend with the adjacent landform.	Landform integration	The bund material is pushed to the north and the final profile considered to be sufficiently blended with the adjacent landform.	Copy of the Slopes, geotechnical and stability assessment

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
					required for the Final Closure Plan. Photographs and records of execution (engineering check).
All Domains	All Domains	Post mining landforms will be geotechnically stable, free draining and non-polluting.	Ponding	Landforms are free draining with an absence of ponding (excluding retained water storage dams).	Details included in Final Closure Plan. Engineering/water management assessment.
			Slope angle	Slopes are generally up to 10 degrees and steeper in areas commensurate with the surrounding landscape.	Copy of the Slopes, geotechnical and stability assessment required for the Final Closure Plan. Photographs and records of execution (engineering check).
			Final landform drainage plan	Final landform water management system is designed and constructed in accordance with an approved Final Landform Drainage Plan.	Copy of the Slopes, geotechnical and stability assessment required for the Final Closure Plan.
			Longitudinal grade of contour banks	Contour grade ≤ 2%.	Photographs and records of execution (engineering check).

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
			Landform stability	Drainage structures are assessed to be stable with no significant active erosion or bank failure.	Copy of the Slopes, geotechnical and stability assessment required for the Final Closure Plan.
Domain A – Native Ecosystem Domain B – Agriculture–- Grazing	All domains	Growth media is suitable for establishing the desired vegetation community.	Soil characterisation	Topsoil and subsoil has been tested to assess suitability for intended post mining land use.	Soil testing results.
			≥ 250mm of subsoil material e.g. clay ≥ 50mm of topsoil	Soil Assessment Results and Rehabilitation Monitoring Report.	Soil testing results.
			Amelioration	Topsoils and subsoils are ameliorated in accordance with the recommendations of the soil characterisation (including application of boiler ash, fertilisers, and organics as required).	Records of soil and ameliorants for future rehabilitation areas.
		Erosion hazards are minimised.	Temporary ESC	Erosion and sediment controls are installed prior to topsoil respreading.	Inspection reports. QAQC of this stage of future rehabilitation.
All Domains	All Domains	Weed species and feral animals are controlled and do not significantly impact the desired final land use.	Feral animals and noxious weed presence.	Feral animals and weed species presence and abundance is not considered to adversely impact the intended final land use.	Results from monitoring reports are included in AEMR. Records of weed and feral management eg. Invoices.
			Feral animal and noxious weed control.	Feral animals and noxious weeds are controlled in accordance with legislation.	Results from monitoring reports are included in AEMR. Records of weed and

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
					feral management eg. Invoices.
		Bushfire risk is managed on rehabilitation areas.	Fuel loads	Fuel loads and fire breaks in and surrounding rehabilitation areas are assessed and maintained in accordance with the Bushfire Management Plan.	Inspections. Records of liaison with RFS.
			Access	Adequate access for firefighting is maintained on rehabilitation areas.	Inspections. Records of liaison with RFS. To be covered in final Closure Plan (including road access and dams onsite).
		Soil profile is developing appropriate for the intended post mining land use.	Soil quality	Soil chemical characteristics including: pH, EC, major cations (K, Na, Al, Ca, Zn), Sulfur and nitrate are comparable with analogue site (PD3).	Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Ground cover	Ground cover (vegetation, leaf litter, mulch) greater than 70% at Year 5.	Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
	All Domains	Native forest rehabilitation areas will include	Habitat features	Habitat features are installed on rehabilitation areas including:	Inspections and photos.

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
Domain A – Native Ecosystem		fauna habitat features.		- Nesting boxes and salvaged hollows if available; - Crushed timber spread over native forest rehabilitation areas if available (excluding Wangcol Creek area); and - rock pile clusters.	Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
		Native forest rehabilitation areas will be compatible with surrounding native vegetation.	Species composition	Native forest vegetation is established in accordance with the approved species mix.	Inspections and photos.
			Vegetation health	More than 75% of indicator species are assessed to be healthy and growing at Year 5.	Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
Domain B – Agriculture–- Grazing	All Domains	Pasture rehabilitation areas will be established comparable to surrounding undisturbed pasture lands.	Pasture species	Approved pasture species mix is sown at the specified rate per hectare.	Inspections and photos.
			Species composition	Established pasture mix comprises approximately 70% perennial grasses and 20% annual legumes, representative of species at analogue sites.	Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Weed presence	Weeds including African Lovegrass comprise less than 10% of the total pasture sward.	Inspections and photos. Results from monitoring reports are

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
					included in AEMR. Summary of results within Final Closure Plan.
All Domains	All Domains	Erosion does not present a safety hazard or compromise the post mining land capability.	Soil loss	Net annual soil loss is comparable to analogue sites at Year 10.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Erosion features	There are no significant erosion features that compromise landform stability or public safety (including gullying or tunnelling).	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
		Soil profile is developing appropriate for the intended post mining land use.	Soil quality	Soil chemical characteristics including: pH, EC, major cations (K, Na, Al, Ca, Zn), Sulfur and nitrate are comparable with analogue site (PD3).	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
					within Final Closure Plan.
			Ground cover	Ground cover (vegetation, leaf litter, mulch) greater than 70% at Year 5.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
Domain A – Native Ecosystem (including Wangcol Creek)	All Domains	Native fauna utilising the rehabilitated area.	Woodland birds present	Evidence of woodland birds utilising rehabilitated areas.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Evidence of mammals	Evidence of target mammal species presence in rehabilitated areas.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
		Native forest rehabilitation areas are self-sustaining.	Natural revegetation	Evidence second generation of indicator species from desired vegetation community.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Structure	Structural layers (canopy, mid storey understorey and ground cover) are comparable to analogue sites.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Vegetation health	Indicator species tree height and girth is within the range of analogue sites.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
	All Domains	Pasture rehabilitation	Natural regeneration	Evidence of natural regeneration of at least four pasture species at Year 5.	Inspections and photos.

Final Land Use Domain	Mining Domain	Rehabilitation Objective	Indicator	Completion Criteria	Validation Method
Domain B – Agriculture–- Grazing		areas are self-sustaining.			Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Rural Land Capability	Pasture rehabilitation areas are assessed to have Rural Land Capability Class VI or better (suitable for grazing).	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan.
			Management inputs	Management inputs (ameliorants, fertilisers, weed treatments) are within the range of analogue sites.	Inspections and photos. Results from monitoring reports are included in AEMR. Summary of results within Final Closure Plan. Records of ameliorants.

4.2. Rehabilitation Objectives and Rehabilitation Completion Criteria – Stakeholder Consultation

This section must include a table summarising all consultation undertaken to develop rehabilitation objectives and rehabilitation completion criteria (including any relevant consultation associated with the development consent).

Stakeholders consulted to develop rehabilitation objectives and rehabilitation completion criteria must include the consent authority, landholders for any part of the mining area, and any other regulatory agency associated with any regulatory requirement for rehabilitation listed in section 2.1.

This summary must identify:

■ each relevant stakeholder (e.g. the NSW Resources Regulator, other government agencies–- such as Water NSW in drinking catchment areas, landholders, community consultative committees)

■ the consultation activities and forms of consultation

■ the matters subject to consultation

■ actions taken by the lease holder in response to matters raised by any stakeholder in relation to rehabilitation objectives and rehabilitation completion criteria.

4.2.1. Previous Rehabilitation and Closure Consultation

During the preparation of the previous C&M MOP, EnergyAustralia forwarded copies of the draft C&M MOP to the following:

- The NSW Resource Regulator;
- NSW EPA;
- Lithgow City Council;
- WaterNSW;
- Department of Industry – Land and water Division (now DPE); and
- Forestry Corporation of NSW.

Details of consultation relevant to the rehabilitation and closure of Pine Dale prior to 2021 is summarised in **Section 4.2.2.2**

4.2.2. 2022 Rehabilitation and Closure Consultation

For the preparation of this RMP, the following agencies and stakeholders have been consulted:

- The NSW Resource Regulator;
- NSW EPA;
- Lithgow City Council;
- WaterNSW; and
- Department of Industry – Land and Water Division (now DPE).

This was a requirement of the Schedule 3 Condition 54 of the Project Approval.

All stakeholder consultation received from the draft RMP is summarised in **Table 8.** EnergyAustralia will continue to liaise with relevant stakeholders and landowners when required. Any matters raised by stakeholders will be considered in the day-to-day management of the site. This RMP may be updated as appropriate in the event of further consultation.

Table 8 – Stakeholder Consultation from 2022

Date	Stakeholder	Details	Pine Dale Actions
13 May 2022	NSW Resource Regulator	A copy of this RMP was sent to this department for comment. EnergyAustralia received a response from the NSW Resources Regulator on 9 June 2022, with this attached in Appendix 3.	No changes to the draft RMP were required.
13 May 2022	NSW EPA	A copy of this RMP was sent to this department for comment. EnergyAustralia received a response from EPA on 24 May 2022, with this attached in Appendix 3.	No changes to the draft RMP were required.
13 May 2022	Biodiversity Conservation Division (BCD)	A copy of this RMP was sent to this department for comment. EnergyAustralia received a response from BCD on 17 June 2022.	Details on the response actions are summarized below in **Table 9**. BCD's comments on the Draft RMP are found in Appendix 3.
13 May 2022	Lithgow City Council	A copy of this RMP was sent to this department for comment. EnergyAustralia received response from Lithgow City Council 2 June 2022, with this attached in Appendix 3.	No changes to the draft RMP were required.
13 May 2022	WaterNSW	A copy of this RMP was sent to this department for comment. EnergyAustralia received response from WaterNSW on 15 June 2022, with this attached in Appendix 3.	No changes to the draft RMP were required.
March 2022	CCC	The RMP has been discussed at the March 2022 CCC meeting.	No changes to the draft RMP were required.

Table 9 provides further comment on the recommendations from BCD received on 17 June 2022 during consultation for the draft RMP.

Table 9–-Comments from BCD (June 2022)

Rec Number	Comment from BCD	Pine Dale Response
1.1	Final Land Use Domain A – Native Ecosystem should be divided into multiple rehabilitation zones based upon contemporary ecological advice.	Pine Dale will consider multiple rehabilitation zones in the future and during the development of the Final Closure Plan if appropriate. Rehabilitation efforts will be based on contemporary ecological advice. The site will use a recommended woodland mix. Treatment Plan 12 has been developed (Section 3) to plan species mix further. Refer to **Table 6** and **Section 6.2.3.2** for further details. There is no requirement for multiple rehabilitation zones in the Form and Way process.
1.2	Rehabilitation objectives for final land use Domain A – Native Ecosystem should relate to the relevant defined biodiversity values. A single rehabilitation objective could relate to multiple biodiversity values. For example: Increase habitat suitability and connectivity for endemic fauna facilitating threatened species movement and abundance in the rehabilitated areas.	Pine Dale have developed Rehabilitation Objectives based on previously completed rehabilitation as well as previously approved MOP Objectives, and believe these are practical, achievable, and commensurate with the surrounding landscape. Any changes required to the Rehabilitation Objectives would be based on contemporary ecological advice. Refer to **Table 6** for further details and Treatment Plans.
1.3	Specific and measurable indicators for each of the rehabilitation objectives need to be identified. For example: a) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 731: “Broad-leaved Peppermint–- Red Stringybark grassy open forest on undulating hills; South Eastern Highlands Bioregion” at Rehabilitation Zone A. b) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 677: “Black Gum grassy woodland of damp flats and drainage lines of the eastern Southern Tablelands; South Eastern Highlands Bioregion” at Rehabilitation Zone B.	Refer to responses above (Rec 1.2). Prior to further rehabilitation EnergyAustralia will engage a suitably qualified expert for specialist advice.
1.4	Specific, measurable, and achievable completion criteria need to be identified for each of the rehabilitation objectives. For example:	Please refer to response to Rec 1.2 above.

Rec Number	Comment from BCD	Pine Dale Response
	a) At least three tree species associated with PCT 731 persisting at a density of at least 25 per cent cover within Rehabilitation Zone A after five years following completion of initial planting / seeding of this zone. b) At least two tree species associated with PCT 677 persisting at a density of at least 10 per cent cover within Rehabilitation Zone B after five years following completion of initial planting / seeding of this zone.	
2.1	Provide specific rehabilitation actions for ecosystem and land use establishment (section 6.2.5), and separately for ecosystem and land use development (section 6.2.6). a. Link these actions to specific rehabilitation objectives and completion criteria. b. Ensure the actions adhere to the SMART principles.	The rehabilitation criteria are adequate in meeting the objectives for the ecosystem land use establishment and development phases. Please refer to Rec 1.2 above. The RMP Completion Criteria (**Section 2.4)** are not required to be driven by rehabilitation phase as per the Resources Regulator's Form and Way guideline. Information in **Sections 6.2.5** and **6.2.6** describe rehabilitation maintenance activities, erosion, and weed control.
3.1	Provide an updated rehabilitation schedule detailing the estimated time to complete proposed rehabilitation activities. The trigger for this rehabilitation schedule may be the date any decision is made for closure of the mine.	Pine Dale agree that the rehabilitation schedule will be updated if/when a decision is made to move into the closure phase. The rehabilitation schedule will be outlined in the Final Closure Plan. The Forward Program describes a schedule of rehabilitation and is submitted to the Resources Regulator annually.
4.1	Implement a robust quality assurance process including independent audits of performance against performance targets and completion criteria by qualified auditors of environmental management systems.	Pine Dale has committed to engaging independent specialists to undertake rehabilitation monitoring, which assesses rehabilitation against the Objectives and Completion Criteria. Treatment Plan 1 (**Appendix 1**) is a commitment for further quality assurance process development. Specialist input will be required in future ESF2 applications.

5. FINAL LANDFORM AND REHABILITATION PLAN

This section must include an electronic copy (PDF) of the final landform and rehabilitation plan, which must be prepared using theme data submitted to the mine rehabilitation portal as per Form and way: rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines.

The final landform and rehabilitation plan electronic copy (PDF) must reference the mine rehabilitation portal data theme submission ID numbers. Submission ID numbers are unique identifiers generated by the mine rehabilitation portal to identify the current data submission for each data theme uploaded by the lease holder and can be found in the 'Files Submitted' tab following successful submission of data.

The final landform and rehabilitation plan PDF must be presented as at least two sub-plans:

1. Plan 1: Final Landform Features

2. Plan 2: Final Landform Contours.

This section must include a copy of each sub-plan in A3 format and contain the following elements:

■ Title block including the mine's name, plan name, year (anticipated year for relinquishment), data theme submission ID numbers, and the plan date (date of creation)

■ Legend identifying all features shown

■ North arrow

■ Scale bar

■ Labels (where appropriate)

■ Basemap – satellite, NSW basemap or equivalent

■ Spatial data identified in Form and way: Rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan for large mines.

Note: For large operations it may be appropriate to prepare multiple sub plans in A3 format (e.g. marked 1A, 1B as necessary) to clearly depict all mandatory requirements.

This section outlines the Final Landform and Rehabilitation Plans for Pine Dale which have been prepared as per the RMP Form and Way Document.

The two plans include:

Plan 1: Final Landform Features

Plan 2: Final Landform Contours.

The plans reference the mine rehabilitation portal data theme submission ID numbers.

Plan 1 and **Plan 2** are presented in **Appendix 2**.

6. REHABILITATION IMPLEMENTATION

6.1. Life of Mine Rehabilitation Schedule

This section must describe the rehabilitation schedule over the life of the mine, from the commencement of the rehabilitation management plan until lease relinquishment. The summary must include the:

a. estimated timing of the construction and decommissioning of key infrastructure (e.g. tailings storage facilities)

b. assumptions and principles that are relied on for the development of the life of mine rehabilitation schedule (e.g. production milestones or anticipated volumes of overburden to be handled) to ensure that rehabilitation is undertaken progressively as soon as reasonably practical.

The life of mine rehabilitation schedule must include a series of plans illustrating the proposed mine layout and sequence of progressive rehabilitation across the leasehold area at a minimum of five-yearly intervals until completion of mining and achievement of the final land use.

The series of plans must be attached to the rehabilitation management plan in A3 format and contain the following elements:

- Title block including the mine's name, plan name, year, and the plan date (date of creation)
- Legend identifying all features shown
- North arrow
- Scale bar and coordinate system
- Labels illustrating the sequence of mining and rehabilitation activities
- Basemap – satellite, NSW basemap or equivalent
- Mine layout
- Progressive rehabilitation schedule–- across the lease area at a minimum of five-yearly intervals until completion of mining and achievement of the final land use.

The RMP Form and Way document outlines that this section should describe the rehabilitation schedule over the life of the mine, from the commencement of the rehabilitation management plan until lease relinquishment. The life of mine rehabilitation schedule must include a series of plans illustrating the proposed mine layout and sequence of progressive rehabilitation across the leasehold area at a minimum of five-yearly intervals until completion of mining and achievement of the final land use.

This section is not applicable to Pine Dale as over the next three years there is no planned disturbance or rehabilitation, with this covered under the Annual Rehabilitation Report and Forward Program. EnergyAustralia does not have any defined timeframes for additional rehabilitation beyond this three-year period.

If a decision is made for closure at Pine Dale, then the Annual Rehabilitation Report and Forward Program would be updated and rehabilitation completed to meet the requirements of Plan 1 and 2 – Final Landform and Rehabilitation Plan (see Section 5 of this RMP).

The RMP would also be updated if there is a change in the site status (ie. recommencement or final closure activities are commenced).

6.2. Phases of Rehabilitation and General Methodologies

The purpose of Section 6.2 is to demonstrate that:

■ risks and opportunities for rehabilitation identified in the rehabilitation risk assessment have been considered in rehabilitation methodologies

■ relevant controls nominated in the rehabilitation risk assessment have been incorporated into the relevant activities.

The final land use objectives will be achieved through a series of conceptual stages which can be described as:

- Stage 1: Decommissioning – removal of hard stand areas, buildings, contaminated materials, hazardous materials.
- Stage 2: Landform Establishment – incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology.
- Stage 3: Growing 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.
- Stage 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.
- Stage 5: Ecosystem and Land Use Sustainability – incorporates components of floristic structure, nutrient cycling recruitment and recovery, community structure and function which are the key elements of a sustainable landscape.
- Stage 6: Rehabilitation Complete – land use and landscape are deemed as suitable to be relinquished from the Mining Lease.

6.2.1. Care and Maintenance Phase

This subsection must summarise the risks and opportunities for rehabilitation associated with the active mining phase across the mining domains. As a minimum, the rehabilitation management plan must address the matters listed below.

The following sub-sections detail activities that will still be undertaken while the site remains in care and maintenance. These activities are environmental management strategies aimed at specifically minimising environmental impacts and enhancing rehabilitation outcomes.

6.2.1.1. Soils and Materials

This subsection must describe the general processes to identify, quantify, characterise and assess the suitability for rehabilitation of topsoil, subsoil and material resources (e.g. inert capping material).

Information in this subsection must demonstrate that the lease holder has taken steps to:

■ develop the optimal approach to stripping and salvaging (including timing) suitable topsoils and/or subsoils

■ maximise the integrity of the topsoil and material resources for future use in rehabilitation

■ ensuring soil and material resources are available to meet the needs of the final land use.

This subsection must summarise the results of any topsoil, subsoil and material characterisation that has been undertaken to date, and the key constraints or opportunities for the use of these resources in rehabilitation.

This subsection must also include a statement indicating whether a soil and/or material resource deficit is anticipated for life of mine rehabilitation and propose actions to address any deficit.

Soil resources at Pine Dale Mine require careful management so that they are not wasted or lost through wind or water erosion and are available for rehabilitation of the disturbed areas. Existing topsoil stockpiles were used to rehabilitate proposed areas prior to the commencement of C&M.

There is no planned soil handling, transport or stockpiling activities proposed to be undertaken during the C&M. Soil resources utilised for rehabilitation at Pine Dale Mine are typically acidic and nutrient deficient. EnergyAustralia propose to ameliorate soils in pasture and treed rehabilitation areas with poor vegetation growth to enhance the chemical properties required to sustain growth. The Statement of Commitments associated with the Project Approval outlined a series of controls relating to soil management, including retaining soils stripped from undisturbed areas of the Project Site for rehabilitation works.

Other controls include:

- 2014 Soil Assessment and Recommendations for Rehabilitation Report.
- Annual rehabilitation monitoring.

The RMP Risk Assessment identified soils and materials as a low risk, however noted an additional treatment plan was required:

- Treatment Plan 3–- Additional soil and overburden testing required for any future rehabilitation areas. Include PAF and NAF testing. To be completed as part of Final Closure Plan.

6.2.1.2. Flora

This subsection must describe the management of resources required to establish any specific flora species in rehabilitation, including (but not limited to) threatened species, seed collection, propagation in a nursery, translocated plants, revegetation techniques, and weed and pest management.

Flora and fauna management controls are included as part of the Statement of Commitments within Project Approval 10_0041. The Statement of Commitments require Pine Dale to:

- Utilise local native plant species and shrubs for rehabilitation and landscaping;
- Undertake replacement planting of some of the same tree species and shrubs within the Project Site upon cessation of mining activities; and
- Retain suitable bush rock with the topsoil and respread during the rehabilitation phase to return groundcover to near-original state.

Weeds will be managed in accordance with the Weed Management Plan. Three common weeds that occur at the Pine Dale Mine site are Blackberry, Briar Rose and St. John's Wort. The noxious weed, African Lovegrass has also been identified in rehabilitated pasture areas.

Weeds are treated seasonally with herbicides as per the weed management schedule. Weed control will continue during C&M as part of vegetation improvement works in relevant pasture and treed rehabilitation areas.

The RMP Risk Assessment identified flora rehabilitation and management as a low risk with no further controls required while the site is in care and maintenance.

6.2.1.3. Fauna

This subsection must describe the management of fauna, including habitat management (during clearing and progressive rehabilitation), threatened species, habitat augmentation (rock piles, frog ponds, log piles and translocated stag trees), and pest control designed to achieve specific fauna outcomes that may be specified in the approved rehabilitation objectives and rehabilitation completion criteria.

In April and July 2012 Eco Logical Australia undertook a pre-clearance vegetation survey in accordance with Section 75 and 77A of the EPBC Act. The survey report and associated procedure ensures that potential impacts to fauna are minimised. No clearing activities are proposed to be undertaken during C&M.

Monitoring of the Purple Copper Butterfly population has ceased and is not required while the site is in C&M as the action identified under the EPBC Act referral is no longer being undertaken. The Action is defined as mining.

Fauna management controls are provided in the Statement of Commitments for Project Approval 10_0041. Under the Statement of Commitments Pine Dale Mine is required to:

- Provide habitat for important target species such as the Purple Copper Butterfly through planning of appropriate flora species (e.g. *Bursaria spinosa spp lasiophylla*);
- Progressively increase forest and woodland communities within the already disturbed areas, the overburden emplacement areas, and the rehabilitated land, to provide foraging and sheltering habitat; and
- Use nesting boxes if required and salvage hollows to assist in maintaining the short- and long-term habitat value for hollow dependent species.

The RMP Risk Assessment identified fauna rehabilitation and management as a low risk with no further controls required while the site is in care and maintenance. There is no additional clearing planned at the site.

6.2.1.4. Rock/Overburden Emplacement

This subsection must describe the areas identified for emplacements and/ or capping, the sequencing of emplacements/capping, construction and management to facilitate sustainable landform design and rehabilitation outcomes.

This subsection must also include a statement indicating whether a materials deficit for life of mine rehabilitation is anticipated and propose actions to address any deficit.

As the site is in care and maintenance, there is no extraction of rock or overburden. It remains unlikely that there will be any adverse environmental impacts during the care and maintenance period. However, to minimise dust dispersion and soil erosion, the 2020 Annual Review states that overburden stockpiles located within the northern area of the Yarraboldy Extension have been re-contoured and seeded with pasture species.

The site has undertaken soil analysis on existing rehabilitation and maintains a general material balance to manage emplacement.

The RMP Risk Assessment identified rock and overburden emplacement as a moderate risk with the following additional control added:

- Treatment Plan 2–- Review material balance as part of the Final Closure Plan. Implement changes based on this process.

6.2.1.5. Waste Management

This subsection must outline waste disposal and materials handling practices, including the disposal of putrescible wastes, hydrocarbons and management of contaminated soils to minimise or mitigate adverse impacts to rehabilitation.

Waste streams are separated into four categories at Pine Dale. Each stream will be managed accordingly. The following waste streams are applicable to Pine Dale Mine to include:

- Putrescible waste;
- Hydrocarbons;
- Contaminated Soils; and
- Sewage.

Putrescible Waste

General waste bins will be provided on site at the office to collect putrescible waste. These bins will be emptied as part of the regular maintenance and inspection program. With the low number of current employees (rarely visitors), it is expected that there will be minimal putrescible waste collected.

Hydrocarbons

There are no current hydrocarbons stored at site. However, if this was required, they would be stored within bunds as per Australian standards. Waste hydrocarbon materials would be collected and transported offsite by a licensed contractor.

Contaminated Soils

A contamination report on the park-up area of Pine Dale was undertaken in 2015 by RCA Australia following a request by the Department of Industry Resources and Energy and EPA. The 2015 report, titled Validation of Contamination Removal, found minor hydrocarbon contamination was present across the park-up area of the site, however due to the C&M status of the site, there was no further remediation works recommended. EnergyAustralia will assess further decontamination works if the status of the site changes from C&M (ie. reopening or final closure), or when the removal of all non-heritage infrastructure in the park-up area commences.

If any further contaminated soils are to be identified, the material would either be treated in-situ or disposed of off-site by a licensed contractor. A contamination assessment is proposed as part of the Final Closure Plan.

Sewage

Sewage management facilities will continue to be maintained during the C&M period with regular inspections and pump out taken as required.

The RMP Risk Assessment identified waste management as low risk. No additional controls were added.

6.2.1.6. Geology and Geochemistry

This subsection must describe the geophysical and geochemical risks related to waste emplacements (e.g. sodic spoils) and ore beneficiation (if any) and outline the management/mitigation measures relevant to rehabilitation (e.g. selective handling and emplacement of materials hostile to plant growth).

During C&M, Pine Dale will utilise a general materials balance to manage rock and overburden volumes and emplacement. The site has undertaken material assessments, as presented in the 2014 *Soil Assessment Recommendations for Rehabilitation Report* and 2018 *Rehabilitation and Completion Assessment* by SLR Consulting for the purpose of controlling geological or chemistry risks to the site for future rehabilitation.

The RMP Risk Assessment identified moderate risk to geology and geochemistry at the site, with the following Treatment Plan proposed:

- Treatment Plan 3: Additional soil and overburden testing required for any future rehabilitation areas. Include PAF and NAF testing. Soil and overburden testing to be completed as part of Final Closure Plan.

6.2.1.7. Material Prone to Spontaneous Combustion

This subsection must describe the potential for spontaneous combustion, including:

■ a summary of previous spontaneous combustion occurrences (if any)

■ the risk of spontaneous combustion occurrence / propensity for combustion of ores and waste materials

■ key management measures relevant to rehabilitation of areas where there is material prone to spontaneous combustion.

Pine Dale Mine does not have a history of spontaneous combustion and historically there have been no incidents recorded during mining operations. The potential for any spontaneous combustion is very low, and it is unlikely that during care and maintenance, Pine Dale Mine will experience any spontaneous combustion due to its history and carbonaceous materials. Statutory inspections will continue during care and maintenance as a means to control any potential matters relating to spontaneous combustion.

The risk assessment identified spontaneous combustion as a low risk. As a result, no further controls were recommended.

6.2.1.8. Material Prone to Generating Acid Mine Drainage

This subsection must identify the presence of any potential acid forming (PAF) materials, acid rock drainage issues and other geochemical issues of concern. If relevant, this section must describe the management of these materials to minimise or mitigate adverse impacts to rehabilitation (e.g. acid rock drainage impacts). This site must summarise the history of any instances (if relevant).

The site has identified that there are some washery waste materials at the historic Wallerawang Colliery, Commonwealth Colliery and Pine Dale that are prone to acid rock drainage (ARD). Geochemical testing, soil testing and water monitoring have been undertaken in the area to assess the extent of the potential ARD in the area. Controls to address known and potential ARD include:

- The removal of coal-bearing material near the concrete drain adjacent to Wangcol Creek (formerly Neubecks Creek);
- Development and implementation of a channel health and stability monitoring program;
- Construction of rock lined drop structures to stabilise water channels at three locations;
- Continuation of progressive rehabilitation works;
- Covering of the coal bearing material identified on the south bank of Wangcol Creek in the vicinity of sampling point S3; and
- Spreading of lime over rehabilitated areas as required.

Section 8 outlines ARD potential during rehabilitation monitoring. **Section 4** outlines completion criteria relating to ARD materials.

The RMP Risk Assessment identified ARD potential as a low risk. The following additional controls were added:

- Treatment Plan 4–- Prior to closure EnergyAustralia to review if there is PAF and that it is buried or capped by 5m of inert overburden in new rehabilitation areas.

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

This subsection must describe:

■ the geochemical and geophysical characteristics of the beneficiation waste stream and how it is managed, as well as how the process, including disposal methods (e.g. emplacement facilities), will be designed and managed to reduce risks to rehabilitation (e.g. geotechnical instability, geochemical constraints)

■ stability issues and associated management/treatment strategies that may relate to tailings dams.

Reject Management Previous Operations

No tailings were produced at site and any reject was co-disposed in the pit. EnergyAustralia believe that this reject was then covered with overburden. Known areas of reject have been capped and rehabilitated. Area 8, chitter emplacement area has been capped. There were two controls identified in the risk assessment including:

- Treatment Plan 5–- Future rehabilitation monitoring reporting to note if any rejects or carbonaceous material is at site.
- Treatment Plan 6–- Areas of known carbonaceous areas would need to be capped at closure. To be covered in Closure Plan.

Reject Management Current Operations

As the site is in care and maintenance there is no coal processing activities occurring at the site, hence this will remain not applicable unless a decision is made to recommence operations.

6.2.1.10. Erosion and Sediment Control

This subsection must describe the potential for erosion and sedimentation impacts to rehabilitation (e.g. sheet erosion and subsequent loss of fine material from shaped emplacement areas awaiting revegetation). It must describe how rehabilitation areas will be managed to minimise and/or mitigate adverse impacts to rehabilitation. It must include any interim rehabilitation measures (e.g. interim stabilisation or temporary vegetation measures) that are proposed prior to final rehabilitation measures being undertaken at disturbed areas (e.g. interim rehabilitation to prevent erosion, weed incursion and/or dust generation in areas which may be mined at a later stage).

As stated in **Section 6.2.1.1**, soil resources will be carefully managed as not to lose any material through wind or water erosion so that disturbed areas can be rehabilitated. Any remaining stockpiles will be vegetated with pasture species as required.

Erosion and sediment controls identified in the C&M MOP include:

- Permanent measures such as the diversion of clean water from above the disturbed areas;

- Containment of runoff from disturbed areas by sediment basins and temporary measures including contour banks, drains and silt-stop fences; and

- The installation of silt fences and hay bales to minimise soil erosion during rainfall events.

The RMP Risk Assessment identified erosion and sediment control as a low risk while in care and maintenance.

6.2.1.11. Ongoing Management of Biological Resources for Use in Rehabilitation

This subsection must describe:

■ how biological resources (e.g. topsoil stockpile seedbanks) will be effectively managed during the mining and production phase to maintain their integrity for later use in rehabilitation

■ topsoil stockpile management measures to maintain the viability of the topsoil seedbank (e.g. maximum stockpiling period) and minimise adverse impacts to the seedbank from unwanted species (e.g. weed management)

■ required topsoil depths for optimal germination, growth and survival of emerging vegetation

■ methods for propagating native seeds and other propagules, and translocation of species (if applicable)

■ salvage and storage of habitat structures including tree stags and or hollow bearing timber/logs for later use in rehabilitation.

Ongoing management of biological resources for rehabilitation is not applicable to the current rehabilitation phase of Pine Dale. During the C&M period, there is no clearing or further disturbance proposed.

The RMP Risk Assessment identified the risk of inadequate biological resource management as not applicable to the C&M status of the site and assigned as low risk.

6.2.1.12. Mine Subsidence

This section must describe subsidence remediation processes that may be required to rehabilitate subsidence impacts. This section must describe:

■ the range of subsidence mitigation and remediation techniques that may be implemented

■ the process of validating whether subsidence mitigation and remediation techniques have been effective.

To avoid duplication for underground coal mining operations, where the above information may be contained as part of an extraction plan or subsidence management plan approved under the relevant development consent or mining lease(s) respectively, a reference to the relevant sections must be included in this subsection.

This section is not applicable to the RMP.

It is unlikely that mine subsidence will occur at site during the C&M period as there is no history of subsidence recorded during active mining operations. During the C&M period, Pine Dale will continue to carry out statutory inspections to identify potential matters relating to subsidence.

Section 6.3 outlines subsidence potential during rehabilitation monitoring. The RMP Risk Assessment identified subsidence potential as a low risk.

6.2.1.13. Management of Potential Cultural and Heritage Issues

This subsection must:

■ outline any relevant approved management plans or strategies based on the outcomes of any cultural and/or heritage assessments relevant to the mining lease, which must include an outline of any scope of works and conservation actions, which may include, but are not necessarily limited to, the following:

 protection, removal, relocation and/or salvage of heritage items, Aboriginal places and objects

 archival recordings

 demolition or part demolition

 dilapidation and integrity surveys

 engineering works to make safe where infrastructure is to be retained for heritage management purposes.

■ identify responsibility for implementing and managing heritage including agreement and/or funding arrangements to be in place for their ongoing management after lease relinquishment where objects, places, items, structures are to be retained for cultural/heritage management purposes (subject to any confidentiality obligations under any other approval or agreement)

■ if the future cultural and heritage management obligations are uncertain, provide an outline of the investigations that the lease holder will be undertaking to confirm the strategy. (Note: The progress towards completing any cultural and heritage assessments/investigations may be required to be provided in the annual rehabilitation report and forward program submitted to the NSW Resources Regulator).

This section is not applicable to the RMP.

During operations, no Aboriginal artefacts of cultural or scientific value were discovered at Pine Dale. As there will be no additional disturbance to land that has not already been previously impacted, it is unlikely that any additional Aboriginal artefacts will be identified.

In the unlikely event that an Aboriginal artefact is identified, the NSW EPA will be notified and the appropriate management measures will be implemented in consultation with relevant stakeholders.

There are no known items of European or natural heritage at Pine Dale.

6.2.1.14. Exploration Activities

This subsection must describe the scope of works that may be required to rehabilitate any exploration activities that may continue to be undertaken on a mining lease.

This section is not applicable. There are no proposed exploration activities during the RMP term.

6.2.2. Decommissioning

As of 2021, Pine Dale Mine has already decommissioned its coal crushing plant, product stockpiles, and historic underground workings. Rehabilitation completion criteria involves decommissioning all mining related infrastructure not required in the final landform. Decommissioning activities that have not been completed include:

- Removal of services;
- Removal of concrete footings, foundation pads, bitumen and concrete pavement; and
- Removal of some water management infrastructure (including pipes, pumps, sediment dams and ancillary equipment).

6.2.2.1. Site Security

This subsection must detail the security measures to be implemented during and following the decommissioning process to prevent access by members of the public (e.g. during shaft filling operations) and secure rehabilitation areas, including any heritage places or objects and any retained infrastructure items.

The Pine Dale Mine perimeter is fenced with signs displayed at various intervals. Along the fence of the private sealed haul road, warning signs have been posted. During C&M the site has been regularly monitored by mine personnel along with routine inspections, monitoring, and upgrades / repairs to fencing structures.

The RMP Risk Assessment found any public safety impacts associated with inadequate site security is a low risk for the site.

6.2.2.2. Infrastructure to be Removed or Demolished

This subsection must identify and describe those site features (e.g. sediment dams), site services (e.g. electricity, water, telecommunications, sewerage, security) and structures to be decommissioned and demolished to achieve the final land use.

It must identify the key actions, assessments, studies, detailed designs, and regulatory approvals required to decommission and/or demolish built infrastructure in accordance with the development consent granted under the Environmental Planning and Assessment Act 1979, mining lease conditions and any approvals or licences issued by other regulatory agencies.

Decommissioning and demolition activities will include the removal of site infrastructure and services as agreed in the final closure plan. Under Schedule 2, Condition 10 of Project Approval 10_0041, all demolition

activities are required to be in accordance with the *Australian Standard AS 2601-2001: The Demolition of Structures*, or its latest version. These areas will be rehabilitated with a combination of pasture area and native forest areas that are compatible with analogue vegetation communities.

For Pine Dale the haul road will remain in place as an access track, however it will be partially rehabilitated, so it is a single vehicle road. There will also be some fences remaining as well as water management infrastructure including dams and pipes. Any other infrastructure to remain at site will be agreed in the final closure plan with the landowner.

The RMP Risk Assessment identified impacts associated with retained or demolished infrastructure were of low risk.

6.2.2.3. Buildings, Structure and Fixed Plant to be retained

This subsection must identify and describe those areas and structures (including infrastructure) to be retained for future use as part of the final land use. It must describe the process that will be implemented to:

■ determine the structural integrity of the building/structure/infrastructure to be retained

■ identify the associated short-term and long-term risks to public safety and the environment from the structures remaining in place, which should identify potential modes of failure

■ address any potential residual risks such as potential for structures to fail

■ engage (where required) a suitably qualified engineer to verify that any risks have been satisfactorily addressed.

The potential for retaining infrastructure will be undertaken as per Schedule 3 Condition 53 of the Project Approval.

At closure *"all infrastructure is to be removed unless there is an agreement with the Secretary of DPI"".* This will be further assessed in the Final Closure Plan. See information listed above (**Section 6.2.2**) for the current infrastructure.

The RMP Risk Assessment identified that the risk associated with retainment or removal of infrastructure is low. Pine Dale introduced the following treatment plan to ensure the site meets its obligations at closure:

- Treatment Plan 8 – Development of the Final Closure Plan, including an assessment of current obligations around retainment or removal of infrastructure at closure.

6.2.2.4. Management of Carbonaceous/Contaminated Material

This subsection must detail the process that will be implemented to identify and appropriately manage any risks associated with the potential occurrence of carbonaceous and or contaminated material. The information must include, but is not limited to, the following:

■ removal and management of carbonaceous/contaminated material from the footprint of surface infrastructure including stockpiles, access roads and haul roads

■ the scope of contamination studies required

■ an overview of potential remediation strategies that will be adopted (e.g. on-site bioremediation or disposal off site)

■ the engagement of a suitably qualified contamination expert (where required) to verify that any contamination has been adequately managed in accordance with any standards associated with the approved final land use.

This subsection must identify and describe the potential timing of contamination remediation activities and how this may impact upon the overall timing of completing rehabilitation activities on site.

During demolition, any identified contaminated material will be removed or remediated in situ.

Areas of known carbonaceous areas will be scalped and removed at closure and disposed in a designated area at site. This area would then need to be capped with overburden.

In 2015, there was hydrocarbon-contaminated material removed from the site, as described in RCA Australia's report titled Validation of Contamination Removal. This was associated with a small oil spill under parked trucks on the hardstand area. There is no known wide spread contamination at pine Dale Mine. A site contamination assessment would be completed as part of any closure and rehabilitation of the site.

The RMP Risk Assessment determined contamination resulting from decommissioning activities is low risk, however the following control was proposed to support the Final Closure Plan:

- Treatment Plan 9 – Contamination Assessment required as part of the closure process and to be included in the Final Closure Plan. This contamination assessment will be undertaken for the workshop, fuel and chemical stores, and crushing and stockpiling facilities.

6.2.2.5. Hazardous Materials Management

This subsection must detail the process that will be implemented to identify and appropriately manage, including any treatment or removal, of any hazardous materials (e.g. hydrocarbons and chemicals) that exist following the cessation of an operation.

Hazardous materials storage tanks, which contained oils, grease and degreasers have been emptied, isolated and secured. These tanks will be kept empty while the site is in care and maintenance. Additional storage tanks have been removed from site. Waste hydrocarbons as a result of decommissioning activities will be collected and removed off site by a licensed contractor.

The RMP Risk Assessment determined the removal of hazardous materials, in particular radioactive density gauges or asbestos, during the decommissioning phase is a low risk. No further controls were identified.

6.2.2.6. Underground Infrastructure

This subsection must identify and describe how underground mining infrastructure will be decommissioned to achieve the final land use. Activities that must be described include, but are not limited to, the following:

■ the sealing of any portals, decline entries, shafts and how the process will be designed, supervised and subsequently validated by a suitably qualified engineer that any risks associated with achieving the final land use outcome have been adequately addressed

■ salvage of underground mining equipment and materials

■ the sealing and decommissioning of any remaining boreholes including services, gas wells, dewatering

■ investigation of the integrity of any former underground mine entries that may have been previously sealed but may require further work to ensure long-term stability

■ security measures that will be implemented for public safety purposes whilst sealing and decommissioning works are undertaken on shafts, adits and drifts

■ implementation of any specific measures required for the future management of groundwater accumulation in the underground workings, which may include measures to be implemented to minimise any environmental or community impacts associated with potential future discharges from the underground workings

■ details of any consultation with government agencies and any subsequent approvals that may be required to allow for any ongoing discharges

■ the removal of any remaining subsidence monitoring pegs (pending approval under the Surveying and Spatial Information Act 2002) that pose a risk to the public, wildlife and stock when subsidence monitoring has ceased, and subsidence related impacts have met relevant approvals.

This subsection must describe the potential timing of underground decommissioning works and how this may impact upon the overall timing of completing rehabilitation activities on site.

There is no underground mining infrastructure at Pine Dale that requires decommissioning or removal.

6.2.3. Landform Establishment

This subsection must provide an overview of the key characteristics of the final landform as shown in the final landform and rehabilitation plan (refer to Part 5). This subsection must detail any modelling undertaken (or to be undertaken – refer to Section 9) to achieve the final landform (e.g. Landform Evolution Modelling to address any long-term erosion and stability risks). The key items that must be addressed are as follows:

Landform establishment is the process of shaping the final landform to a safe, stable and free draining landform that is appropriate for the desired final land use and consistent with the surrounding landscape.

The final shaped landform will be constructed in accordance with the requirements of this document. Rehabilitation has been generally undertaken progressively.

The RMP Form and Way document states that this phase of rehabilitation consists of the processes and activities required to construct the approved final landform (as per the development consent and, for large mines, the approved Final Landform and Rehabilitation Plan). In addition to profiling the surface of rehabilitation areas to the approved final landform profile this phase may include works to construct surface water drainage features, encapsulate problematic materials, and prepare a substrate with the desired physical and chemical characteristics (that is, rock raking or ameliorating sodic materials). The landform design and construction part of this phase incorporates gradient, slope, aspect, drainage, substrate material characterisation and morphology per landform design planning.

6.2.3.1. Water Management Infrastructure

This subsection must detail the location, treatment and or rehabilitation of water management infrastructure.

Where it is proposed to retain infrastructure for future use, this subsection must detail the measures that will be implemented in the landform establishment phase (e.g. spillway augmentation) to ensure that it is fit-for-purpose and appropriately licensed for the approved final land use(s).

The existing water management infrastructure at Pine Dale includes contour drains, rock structures, sediment ponds and dams.

Final landform drainage structures will be designed and constructed to be generally consistent with the design included in the RMP or relevant design plan. Rehabilitation areas will be surveyed and drainage structures (e.g. channels and contour banks) will be constructed in accordance with the survey design to produce a free draining final landform.

Reshaping removed water infrastructure areas will also be undertaken to comply with the final landform. This will include retention of some water infrastructure for the Post Mining Land Use and removal or reshaping of areas to be revegetated.

The RMP Risk Assessment identified water management risks to include inadequate rehabilitation of infrastructure, insufficient future water licensing, or knowledge gaps in surface water or groundwater management for rehabilitation. These were determined to be low risk. However, an additional control developed included:

- Treatment Plan 10 – Final Closure Plan includes water management designs and future licensing if required.

6.2.3.2. Final Landform Construction: General Requirements

This subsection must, as a minimum, detail how the final landform design will be constructed to address the following issues:

■ potential geotechnical/geochemical and erosional issues

■ incorporating characteristics of surrounding landforms into the final landform design (e.g. macro and micro-relief) and general considerations for the visual amenity of the final landform

■ surface water management to optimise landform stability and integration with surrounding catchments.

Final landform will be constructed in accordance with the conditions and commitments set out in the Project Approval and EA.

As a general requirement, the final landform will be geotechnically stable, free draining and non-polluting.

Existing rehabilitation areas and monitoring records from across the life of the mine will be referred to when constructing the final landform to inform adequacy of existing landform designs. For future rehabilitation activities, the landform will be shaped and constructed as per engineering designs developed by suitably qualified experts.

Temporary amenity bunds will be regraded to be consistent with adjacent undisturbed landforms.

Bulk pushing and minor earthworks are undertaken to shape the constructed landform to the desired profile. Soil testing will be undertaken, as well as reference to materials placement records, during shaping activities to ensure geochemical suitability of the landform.

The RMP Risk Assessment identified those risks of inadequate or non-compliant landform design and vegetation mix in the final landform were medium. The following additional controls were proposed to manage these medium risks:

- Treatment Plan 11 – Slopes and stability to be assessed as part of the Final Closure Plan project; and

- Treatment Plan 12 – Seek advice from a rehabilitation specialist in regard to the most suitable species mix for the future rehabilitation. Engage with regulators on the revegetation as part of closure planning.

6.2.3.3. Final Landform Construction: Reject Emplacement Areas and Tailings Dams

This subsection must detail:

■ methods to construct the final landform over reject emplacement areas and tailings dams to a condition/capability that supports the final land use

■ how the rehabilitation design and management measures (e.g. capping design and dewatering strategies) will be implemented (and their associated timeframes) to address potential geotechnical/geochemical/erosional risks of achieving a sustainable rehabilitation outcome.

This section is not applicable to Pine Dale. The site has not produced tailings. Known areas of reject have been capped and rehabilitated. While no formal reject emplacement areas have been present at the site, carbonaceous material has been present on the site and will require capping.

The risk associated with rejects and tailings in the final landform construction was determined to be low during the RMP Risk Assessment.

Further details are provided in **Section 6.2.1.9**.

6.2.3.4. Final Landform Construction: Final Voids, Highwalls and Low Walls

This subsection must identify the key design features (e.g. size, depth, orientation and location) and processes associated with any final void(s) approved in the development consent, and how the design minimises impacts to public safety and reduces the sterilisation of land available for future final landuses. This subsection must also describe any additional strategies or requirements prescribed in the development consent that relate to final voids.

Where details regarding the rehabilitation of the final void(s) are conceptual in nature, details must be provided in this subsection as to what processes will be implemented over the life of the operation to develop a final void management strategy. The information must include the following:

■ details of the process for investigating final land use options for the final void(s)

■ the scope and timing of required studies including (but not limited to):

 final void water balance including groundwater modelling to determine the likely final void water level

 water quality assessments including geochemical studies required to inform management of potential pollution impacts

 geotechnical studies required to determine what stabilisation and public safety measures will need to be incorporated into the final design.

■ details regarding future water licensing requirements for water retained within the final void(s) following mine closure.

This section is not applicable to Pine Dale because there is no approved final void at closure. In C&M the site maintains a void, however this is not present in the post mining land use for the site.

Further landform design and construction standards are required as part of the Final Closure Plan.

6.2.3.5. Construction of Creek/River Diversion Works

This subsection must describe studies required for the detailed design including (but not limited to) geomorphological and hydraulic modelling and aquatic ecological assessments.

This subsection must detail the construction of any creek or river diversion works that will form part of the final landform, including relevant approvals from government agencies required for the construction/diversion. This is to include, but not be limited to, describing the re-creation of aquatic habitat features (e.g. woody debris, snags, gravel beds, cobbles, rocks, boulders, or rock bars), establishment of aquatic vegetation species and assessing ecological processes (e.g. fish passage and aquatic life cycles).

This section is not applicable to Pine Dale because there are no water body diversion works required for closure.

Further details on the management of Wangcol Creek are found in **Section 6.2.6.3**.

6.2.4. Growth Medium Development

This subsection must outline how rehabilitation areas will be prepared with growth media (e.g. vegetation substrate) suitable for establishing vegetation in accordance with the approved final land use (e.g. agriculture, native ecosystems). Based on the nature, scale and risks associated with a site, the information provided must include, but is not limited to, the following:

■ the process that will be undertaken to characterise the geochemical nature of the substrate and associated materials (e.g. subsoils, topsoils, organic additives, overburden surface)

■ an overview of the type of ameliorants and or strategies that may be implemented to address any potential constraints and or enhance the substrate (based on the outcomes of the characterisation analysis)

■ the type of erosion and sediment controls that will be installed to protect the substrate from surface water runoff and wind exposure whilst a vegetative cover is established

■ weed control techniques

■ the type of mechanical treatments that may be required (e.g. deep ripping, harrowing) to maximise water infiltration into the substrate and to provide for an adequate seed bed

■ topsoil and subsoil management as well as other substitutes (e.g. organic material) and how these will be applied

■ potential seasonal considerations that will need to be factored into the process to maximise the viability of the substrate

■ management of rehabilitation areas to minimise degradation of the substrate, dust generation and erosion should adverse conditions delay vegetation establishment

■ where required to meet the approved rehabilitation objectives, measures that will be implemented to augment habitat value (e.g. structures such as tree hollows, logs and other woody debris, ponds).

Rehabilitation at the growth medium development phase will satisfy completion criteria when it is suitable for establishing the desired vegetation communities of either native forest or pasture.

Prior to topsoiling, erosion and sediment controls, such as cover crops, will be installed in rehabilitated areas. Topsoils and subsoils will then be spread at a depth of ≥250 mm (subsoil) and ≥50 mm (topsoil). The soils will be ameliorated in accordance with the specific recommendations based on soil characteristics (including application of boiler ash, fertilisers and organics where required). Soil analysis will continue to characterise the substrate on site as rehabilitation progresses and inform strategies to address shortfalls in growth medium methodologies and measures.

The Annual Works Schedule will anticipate or consider adverse seasonal conditions when planning rehabilitation activities such as revegetation to ensure effective use of resources, such as seeds or biological resources, and to prevent land degradation such as erosion. Weed management activities will continue as determined through routine inspections or the Annual Works Schedule.

Records of maintenance or treatments such as application of ameliorants or herbicide will be maintained.

The RMP Risk Assessment identified one medium risk around the availability of subsoil and topsoil during the growth medium development phase. As a result, Pine Dale will introduce controls based on the recommendations deriving from the following Treatment Plan:

- Treatment Plan 14 – The Final Closure Plan will review subsoil and soil depths as well as criteria and determine feasible topsoil alternatives.

6.2.5. Ecosystem and Land Use Establishment

This subsection must describe how the target vegetation associated with the final land use will be established and subsequently managed to progress to the ecosystem and land use development phase (refer to Subsection 6.2.6). The information provided must include, but is not limited to, the following:

■ potential seasonal considerations (e.g. drought conditions; excessive heat) that will need to be factored into the process to optimise conditions to support the initial establishment of the target vegetation

■ an overview of the methodologies that may be applied as part of the revegetation process (e.g. direct seeding, tree plantings, use of a seed drill)

■ the type and range of species that will be planted, including short-lived pioneer species, to achieve the intended revegetation outcome

■ how seed will be sourced, handled, treated and applied to maximise viability

■ the use of cover crops (where required) to protect the substrate whilst the target revegetation cover is established

■ where required, the type of initial measures that may be adopted (e.g. watering) to promote vegetative establishment and growth

■ weed management and pest animal control to protect juvenile vegetation.

Pine Dale will implement revegetation techniques appropriate to the agricultural grazing final land use criteria. Local agricultural standards and practices will be referenced during this phase when planning revegetation of pasture to 70% perennial grasses and 20% annual legumes.

Seed supply should be planned well in advance of planting to ensure sufficient quantity, diversity and quality are available, specifically rare species that may be difficult to source. Seed with local provenance that occur on similar topography, climatic conditions, and soil types to where they are sown on the rehabilitation should be prioritised. The genetic diversity of seed should also be considered during collection or sourcing. Pine Dale's revegetation approach also considers alternate seeding for target species, including seeding via vectors such as topsoil or fauna.

An additional treatment plan has been proposed to ensure complex habitat features are introduced to the native rehabilitation areas:

- Treatment Plan 13 – Nesting boxes to be installed once trees establish and as overseen by a specialist. This will be included in the Final Closure Plan.

6.2.6. Ecosystem and Land Use Development

This subsection must detail how rehabilitated lands will be actively managed to achieve the approved final land use. Based on the outcomes of the rehabilitation monitoring program (refer to Part 8), this subsection must provide an overview of the management and maintenance program and monitoring that will be implemented to achieve the approved, or if not yet approved, the proposed rehabilitation objectives and rehabilitation completion criteria and demonstrate that rehabilitation is likely to be sustainable in the long-term. The information provided must include, but is not limited to, the following:

■ weed and feral animal control of rehabilitation areas

■ erosion and drainage controls

■ environmental monitoring and management of surface water, groundwater, ecology, land capability

■ re-seeding/planting of rehabilitation areas that may have failed or where key species are under-represented (e.g. lack of germination, high plant mortality rate)

■ maintenance fertilising

■ repair of fence lines, access tracks and other general related land management activities.

For agricultural final land use(s), this subsection must outline how these areas will be managed to demonstrate agricultural productivity (e.g. grazing trials).

6.2.6.1. Weed and Feral Control

Weed control is undertaken in accordance with the Weed Management Plan. Weeds such as Blackberry, Briar Rose, St. John's Wort and African Lovegrass are known to present at site and in the rehabilitation areas. Visual inspections are completed on a regular basis and monitored in the Annual Rehabilitation Monitoring Report. Herbicide application occurs seasonally on weed infestations.

Maintenance activities that will continue during care and maintenance include fencing, fertilising, weed spraying, feral animal control and minor drainage works. This will help to ensure that rehabilitated areas progress towards achieving the established completion criteria.

6.2.6.2. Erosion and Drainage

Erosion within the rehabilitation areas is minimal on site. Areas that have been established with pasture cover or trees have shown minor erosion in areas where there was minimal to no groundcover. The 2020 Rehabilitation Monitoring Report deemed erosion control to be 'satisfactory' with no significant erosion features that would compromise the safety or stability of the final landform.

6.2.6.3. Wangcol Creek (formerly Neubecks Creek) Management

Progressive rehabilitation of Wangcol Creek, formerly known as Neubecks Creek, within mining authorities held by Enhance Place will continue to be undertaken in accordance with the rehabilitation objectives.

Care and Maintenance Works

Between 2014 and 2021 stream health monitoring classified Wangcol Creek as“"potentially stabilisin”" with an activity rating of 60-69% based on CSIRO Ecosystem Function Analysis–- Ephemeral Stream Assessment classifications. This classification requires ongoing monitoring, but notes rehabilitation works are not required in the immediate future. During the C&M phase, Pine Dale is committed to ongoing stream health monitoring.

Rehabilitation Works

Progressive rehabilitation works proposed to be undertaken will include:

- Bank stabilisation works as required;
- Removal of exotic weed species noting the need to balance the removal of pine trees and bank stabilisation requirements;
- Soil analysis (if required);
- Undertake Annual Biodiversity and Rehabilitation monitoring surveys;
- Ongoing surface water monitoring;
- Undertake Channel Stability and Stream Health surveys on a bi-annual basis; and
- The rehabilitation of Wangcol Creek will be undertaken progressively overtime to ensure the highest chance of success. It should be noted that it is not proposed to change the alignment of Wangcol Creek, as such the existing channel and alignment will be used and stabilised accordingly.

Enhance Place will seek specialist advice to ensure rehabilitation of Wangcol Creek is undertaken generally in accordance with the following guiding documents, these include:

- River and Estuaries Policy;
- NSW Wetlands Management Policy;
- Australian Stream Management manual; and
- NSW Biodiversity Strategy.

6.2.6.4. General Rehabilitation Maintenance

Information from the Annual Rehabilitation Monitoring Reports, including on analogue sites and progressive rehabilitation, will be incorporated into the performance criteria.

Routine ongoing maintenance of rehabilitation will be determined by the outcomes of site inspections and rehabilitation monitoring programs. The scope of the routine rehabilitation maintenance during the ecosystem and land use development phase may include the following:

- Re-seeding or planting, such as in locations where target species have not succeeded to reach criteria levels;
- Application of ameliorants or fertiliser;
- Fuel load reduction; and
- Maintenance of fence lines and access tracks.

To ensure criteria for agricultural grazing domains are met, agricultural productivity measures will continue to be undertaken in rehabilitation development. The ensure some areas of rehabilitation meet the criteria of Rural Land Capability Class VI, some of the following maintenance activities may be undertaken:

- Soil testing, particularly for nutrient and soil carbon levels;
- Installation of necessary infrastructure such as fences or stock water tanks and troughs; and
- Grazing trials to demonstrate carrying capacity.

Stock grazing will not commence until the pasture is well-established.

The RMP Risk Assessment generally identified risks at the ecosystem and land use development phase to be low. However, one moderate risk was identified in that rehabilitation completion criteria would not be realistic despite rehabilitation monitoring and therefore, the site would not be able to satisfy the criteria and relinquish the site at the end of rehabilitation. The RMP Risk Assessment proposed the following additional control:

- Treatment Plan 16 – All completion criteria to be assessed in the Final Closure Plan.

6.3. Rehabilitation of Areas Affected by Subsidence

This section must describe subsidence remediation processes that may be required to rehabilitate subsidence impacts. This section must describe:

- the range of subsidence mitigation and remediation techniques that may be implemented
- the process of validating whether subsidence mitigation and remediation techniques have been effective.

To avoid duplication for underground coal mining operations, where the above information may be contained as part of an extraction plan or subsidence management plan approved under the relevant development consent or mining lease(s) respectively, a reference to the relevant sections must be included in this subsection.

This section is not applicable. Refer to **Section 6.2.1.12**.

7. REHABILITATION QUALITY ASSURANCE PROCESS

This section must include a description of the rehabilitation quality assurance process that will be implemented throughout the life of an operation across the following phases of rehabilitation:

a. active mining

b. decommissioning

c. landform establishment

d. growth medium development

e. ecosystem and land use establishment

f. ecosystem and land use development.

This section must describe for each phase of rehabilitation the key actions and/or processes to validate and record 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.

This section must describe how the rehabilitation quality assurance process will be formally integrated into the day-to-day mine planning process, including:

a. the responsibilities for implementation

b. how the process will be formally documented and recorded (e.g. inspection test plans)

c. how the process will be reviewed and refined over time to promote continuous improvement.

Table 10 below outlines the rehabilitation and quality assurance process for Pine Dale.

Some site records do not exist for areas of older rehabilitation.

Table 10–- Rehabilitation and Quality Assurance Process – Pine Dale

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)
Care and Maintenance Phase	Up to date mine plans.	Completed for this RMP.
	Documentation of pre-clearance surveys.	Required for any future clearing.
	Maintenance of a topsoil inventory to document stripped, stockpiled and re-spread resources.	Still required prior to closure. To be covered in Final Closure Plan.
	Regular inspections of erosion and sediment controls.	Inspections currently being completed.
	Regular inspections to identify potential weed infestations. Details of weed status included in rehabilitation monitoring.	Inspections currently being completed
	Weed management spraying records	Current records kept.
	Regular inspections to review spontaneous combustion	Currently being completed.
	Soil testing to determine PAF	Previously completed and reviewed during rehabilitation monitoring.
Decommissioning	Inspections and demolition reports to confirm infrastructure has been removed.	Still required prior to closure. To be covered in Final Closure Plan.
	Removal of waste	Waste records
	Validation testing to ensure any contamination/hazardous substances has been appropriately remediated and/or removed.	Still required prior to closure. To be covered in Final Closure Plan.
	Public safety risks are assessed during decommissioning.	Fencing, signage, security. To be covered in Final Closure Plan.
Landform Establishment	Landform survey Quality assurance signoff of constructed landforms including slopes, landforms and water drainage structures.	Inspections and rehabilitation monitoring is completed, but further validation of existing landforms are required prior to closure. Records for design and construction of landforms to be kept for future rehabilitation. To be covered in Final Closure Plan.
	Records of reject capping depth at site for new rehabilitation areas.	Carbonaceous material and PAF yet to be capped on site will be recorded.
	Recording depths of ripping of rehabilitation areas.	Not previously completed, however can be determined from rehabilitation monitoring. Records

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)
		to be kept for future rehabilitation works. Required for future rehabilitation.
	Slopes, geotechnical and stability assessment required for the Final Closure Plan	To be covered in Final Closure Plan.
	Void Water Management Assessment completed as part of Final Closure Plan.	To be covered in Final Closure Plan.
Growth Medium Establishment	Soil assessment for existing rehabilitation areas.	Covered in rehabilitation monitoring.
	Soil assessment for future rehabilitation areas.	Required prior to future rehabilitation.
	Register of topsoil and subsoil for future rehabilitation.	Not yet complete
Ecosystem and Landuse Establishment	Documentation of seeding or planting activities undertaken including: • Date of planting; • Weather conditions; • Seed mix; • Seeding rate (kg/ha) and/or planting rate (tubestock/ha); • Fertiliser rate (kg/ha); • Records of the salvage of all rehabilitation resources including suitable capping materials, topsoils/subsoils, seeds, habitat structures (e.g. tree hollows and rocks) for use in rehabilitation.	Not all records available for existing rehabilitation sites. Records to be kept for future rehabilitation programs. Records of existing and proposed rehabilitation monitoring.
	Regular site inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation.	Monthly inspections completed
	Rehabilitation monitoring in accordance with **Section 8** to monitor the success of rehabilitation.	Records of existing and proposed rehabilitation monitoring.
	Continuation of environmental monitoring program.	Ongoing. To be reviewed closer to final closure.
	Weed and feral animal infestations; and Documentation of all weed management and eradication programs and follow-up inspections.	Current records kept.
Ecosystem and Land Use Development	Rehabilitation monitoring in accordance with **Section 8** to monitor the success of rehabilitation.	Criteria assessed in the annual rehabilitation monitoring.
	Regular site inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation.	Monthly inspections.

Phase	Key Quality Assurance Steps	Current Record Status (In place/still required)
	Weed and feral animal infestations; and Documentation of all weed management and eradication programs and follow-up inspections.	Current records kept.

The rehabilitation quality assurance process will be used when planning future rehabilitation activities. The objective for rehabilitation will be one of continuous improvement and includes:

- Utilizing relevant industry best practice rehabilitation techniques;
- Utilizing key personnel with rehabilitation and closure experience;
- Continuing to undertake rehabilitation monitoring and assessing against rehabilitation criteria; and
- Reviewing rehabilitation performance against the Trigger Action Response Plan in **Section 10**.

8. REHABILITATION MONITORING PROGRAM

Rehabilitation is monitored and reported annually in the Annual Rehabilitation Monitoring Report.

8.1. Analogue Site Baseline Monitoring

This section must:

■ document the baseline monitoring that has and/ or will be carried out to develop rehabilitation completion criteria for approval by the Secretary

■ include justification for the analogue site(s) selection with respect to the final land use(s) for rehabilitation areas.

This section must describe any baseline assessments that have been conducted (if any) to define rehabilitation objectives and rehabilitation completion criteria and identify any further assessments required to adequately characterise final land use domains and develop specific rehabilitation completion criteria.

Where lease holders propose rehabilitation objectives and rehabilitation completion criteria that are not developed on baseline assessments of analogue sites, this section must outline the methods (e.g. studies, desktop literature reviews) that have been used to identify the defining characteristics and associated 'benchmark values' for each final land use domain.

Rehabilitation completion criteria have been developed based on benchmark data from comparable communities. Pine Dale use two (2) rehabilitation monitoring transects as analogue sites in grazed pasture (pasture analogue site) and undisturbed naturally vegetative areas (Transect 7) to provide benchmarks against the pasture and treed rehabilitation areas.

Annual Rehabilitation Monitoring Reports are undertaken by contracted experts to discuss the progress of rehabilitated lands to meet criteria. Annual Rehabilitation Monitoring Reports have been completed since 2014, developing the long-term dataset available on the site.

A baseline assessment on soils and rehabilitation strategy was completed in 2014 by SLR titled, *Soil Assessment and Recommendations for Rehabilitated Areas – Pine Dale Mine and Enhance Place Mine*. This report contributed to the structure of the Pine Dale's rehabilitation strategy, including referencing regulatory requirements for ecosystem development such as establishment of flora species which are habitat to target species, such as the Purple Copper Butterfly.

Over time (as revegetation develops and matures) additional monitoring parameters may be included in the monitoring program to inform revegetation condition and development (e.g. plant fertility status [fruiting/flowering], woody species density and tree stem diameter and height) and determine requirement of management measures (e.g. thinning).

8.2. Rehabilitation Establishment Monitoring

This section must document the inspection regime that will be implemented at commencement of the ecosystem establishment phase. This section must describe the appropriate monitoring parameters and methods that will:

■ enable early identification of actual or emerging issues that have the potential to delay revegetation establishment

■ identify if triggers have been met for preventative or mitigation controls to minimise the impacts of emerging issues in accordance with the trigger action response plan (refer to Part 10)

■ provide data that may inform continuous improvement of rehabilitation methods.

Pine Dale will undertake flora surveys on areas which have entered the rehabilitation establishment phase of rehabilitation. The rehabilitation monitoring program will include a flora survey to provide qualitative data on indicators such as species composition, weed presence, and vegetation health to assess rehabilitated areas against associated completion criteria. The frequency of the surveys will be based on advice from specialist consultants and will depend on the extent of the area required to be surveyed and its objectives.

The flora surveys will monitor and include as a minimum:

- Species richness;
- Species density;
- Soil analysis (every 2 years);

Additional parameters for native forest domains will be monitored including:

- Forest structure;
- Habitat features;
- Flora surveys; and
- Ecosystem function analysis.

Permanent transect monitoring will assess:

- Erosion and sedimentation assessed in accordance with Best Practice Erosion and Sediment Control (IECA 2006);
- Soil loss calculated using the Revised Universal Soil Loss Equation (RUSLE) (IEAC Australasia 2012);
- Priority weeds, such as African Lovegrass, identified using botanical keys and recorded in accordance with the Central Tablelands Local Land Services 2019;

- Pasture rehabilitation against the Rural Land Capability Assessment (OEH 2007);
- Evidence of fauna and pests by observation of scats, tracks and trail identification, and sightings;
- Habitat features such as nesting boxes, crushed timber piles, or rock pile clusters;
- Fuel loads within and adjacent to rehabilitated areas in accordance with the Overall Fuel Hazard Assessment Guide (Department of Sustainability 2010) and fire-fighting access in accordance with Policy No. 2/2007 Fire Trails (Bush Fire Coordinating Committee 2007); and
- Additional land management activities required such as soil amelioration as determined by the land manager.

The rehabilitation monitoring program includes photo point monitoring for transects and each analogue site. Photos taken at the recorded coordinates provide a visual comparison of rehabilitation establishment as well as progressive rehabilitation across annual surveys.

Visual monitoring of revegetation will be conducted on a regular basis to assess whether vegetation is establishing and to determine the need for any maintenance and/or contingency measures (such as the requirement for supplementary plantings, erosion control and weed control).

Resulting data from the rehabilitation monitoring program will be analysed to determine potential improvements or changes to the applied rehabilitation techniques. This will enable rehabilitation methods that have been successful in progressing rehabilitated lands towards target criteria to be identified and continually applied.

8.3. Measuring Performance Against Rehabilitation Objectives and Rehabilitation Completion Criteria

This section must document the monitoring activities to assess performance against the approved, or if not yet approved, the proposed rehabilitation objectives and rehabilitation completion criteria, and ultimately demonstrate that rehabilitation objectives and rehabilitation completion criteria have been met. Monitoring parameters in the rehabilitation monitoring program must be aligned to the rehabilitation completion criteria, specifically the performance indices.

This section must also detail the monitoring activities (e.g. inspections) undertaken following the completion of key rehabilitation processes in accordance with the quality assurance program, and at the completion of each phase of rehabilitation.

This section must describe the processes to be implemented to:

- assess rehabilitation monitoring data to identify developing trends on rehabilitation areas
- determine if rehabilitation is on a trajectory to achieving the final land use

■ identify any emerging risks of failing to achieve the final land use. This includes assessment of whether rehabilitation monitoring data has exceeded any identified thresholds that trigger intervention or management actions (refer to Part 10).

The methodologies outlined in **Section 8.1** and **Section 8.2** enables the assessment of the trajectory of the rehabilitation in terms of ecosystem establishment and land capability criteria within **Section 4**. The data collected can be used to determine whether the site is approaching a target functional state or requires further treatment plans. Rehabilitation monitoring also allows for the identification of short-term and long-term trends.

EnergyAustralia will evaluate the rehabilitation methodologies and monitoring based on performance and with consultation from key stakeholders. Any key changes to the rehabilitation monitoring program will be reported in the Annual Review and outlined in the RMP.

9. REHABILITATION RESEARCH, MODELLING AND TRIALS

9.1. Current Rehabilitation Research, Modelling and Trials

This section must summarise the status of any current and ongoing rehabilitation research, modelling and trials carried out by the lease holder (as required) to address any knowledge gaps (as relevant) in relation to:

- the control or management of risks identified in the rehabilitation risk assessment
- the development and further refinement of rehabilitation completion criteria and
- the achievement of rehabilitation objectives and rehabilitation completion criteria.

Information in this section must:

a. describe the status of all current trials, modelling and research programs

b. summarise the outcomes of any completed research programs, modelling and rehabilitation trials such as any review or further development of rehabilitation methodologies

c. describe how results have been used to inform the development of future research programs, modelling and rehabilitation trials required to address remaining knowledge gaps.

Pine Dale has no current rehabilitation research, modelling, or trials.

9.2. Future Rehabilitation Research, Modelling and Trials

This section must outline future rehabilitation research, modelling or trials proposed to be carried out by the lease holder to address any risks identified in the rehabilitation risk assessment and any knowledge gaps to meet the rehabilitation objectives and rehabilitation completion criteria (if applicable).

This section must:

- outline the purpose and scope of each proposed research program, modelling or rehabilitation trial, referencing the knowledge gap or rehabilitation risk to which the program, model or trial relates (e.g. tailings storage facility capping trials to develop capping strategies, landform evolution modelling to address any long-term erosion and stability risks)
- identify the objectives of each proposed research program, modelling or rehabilitation trial with respect to rehabilitation methodologies and achievement of the final land use

■ nominate the timing of each proposed research program, modelling or rehabilitation trial to achieve the program or trial objectives to facilitate the lease holder achieving the life of mine rehabilitation schedule and the rehabilitation objectives and rehabilitation completion criteria.

Studies and trials were proposed through the RMP Risk Assessment to consolidate and close out knowledge gaps or enhance existing methodologies and decrease the risk rating. These treatment plans are described in **Section 6.2**.

All technical studies and assessment will be undertaken by suitably qualified experts.

10. INTERVENTION AND ADAPTIVE MANAGEMENT

This part must outline the rehabilitation trigger action response plans (TARPs) and other contingency strategies that will be implemented when rehabilitation monitoring indicates that there are emerging threats to rehabilitation or rehabilitation is not on a trajectory to achieving the final land use. In addition, this part must outline how the results of rehabilitation research and trials will be integrated to continually improve rehabilitation practices.

Table 11 outlines Pine Dale's Rehabilitation Trigger Action Response Plan.

Table 11–- Trigger Action Response Plan

Rehabilitation Risk	Monitoring Trigger	Mitigation Measure
Soil is stockpiled too high.	Soil stockpile greater than 2m high for topsoil and 3m high for subsoil.	Reduce height of soil stockpile.
Erosion of soil stockpiles.	Evidence of active erosion on the soil stockpile (to be retained for greater than 3 months).	Install appropriate upslope water diversions (bunding or drain) and see non-persistent cover crop.
Inadequate soil resources available for rehabilitation.	Soil inventory shows a deficit of soil.	Review rehabilitation plan to ensure there is enough soil available for rehabilitation and/or conduct rehabilitation trials using alternative growth mediums other than soil.
The proliferation of weeds in soil stockpiles, amenity bund or rehabilitation area.	- Greater than 30% groundcover or projected foliage cover is weeds. - Presence of noxious weeds.	Control weeds in accordance with the sites weed management protocols and undertake quarterly follow up inspection of treated area.
Soil has not been spread at appropriate depths on the rehabilitated landform in the Yarraboldy Extension area.	Subsoil depth on the rehabilitated landform is less than 250mm in thickness and / or topsoil less than 50mm.	Spread additional soil over the area and/or apply appropriate treatment to improve soil quality.
Soil infertility	Soil chemical properties assessed as toxic or inhospitable for plant growth.	Ameliorate soils in accordance with soil assessment recommendations (SLR 2014).
Water management infrastructure is not constructed appropriately.	- Water management infrastructure constructed in inappropriate location. - Diversion bunds do not meet design standards of blue book (e.g. longitudinal grade greater than 2%). - Water retention dams do not meet sizing requirements.	Monitor the performance of the water management infrastructure and upgrade if required (e.g. regrade sections of diversion bunds, installation of additional erosion controls, and enlargement of dam).
Services not disconnected prior to rehabilitation.	Services are not disconnected prior to rehabilitation.	Engage appropriate trade person to disconnect services prior to proceeding to the landform establishment phase.

Rehabilitation Risk	Monitoring Trigger	Mitigation Measure
Contaminated sites are present.	Contaminated sites are present.	Remediate contaminated sites in accordance with recommendation of qualified contamination consultant.
Acid bearing material is placed too close to the surface of overburden/interburden emplacement areas in future rehabilitated areas.	Acid bearing material is found less than 5m from the proposed surface of the final landform.	Rehandle acid bearing material to an area that will be at least 5m beneath the surface of the final landform where practicable. If appropriate, add acid amelioration material to rehabilitated areas.
Overburden / interburden is not placed in the appropriate area to be commensurate with the final landform.	Overburden / interburden has not been placed in accordance with the mine plan.	Review final landform plan and make adjustments or rehandle the material to an area to be commensurate with the existing final landform plan.
Overburden / interburden is not placed in a manner that will provide geotechnical stability.	Evidence of slumping in overburden / interburden emplacement areas.	Remediate based on the advice of a geotechnical engineer.
Excess residue is left on the coal stockpile footprints at the time of decommissioning.	Greater than a nominal 20% of the coal stockpile footprints contain coal residue at a depth greater than 20mm at the time of decommissioning.	Remove excess residue from coal stockpile footprints prior to spreading soil material.
Ponding of water is evident on rehabilitated slopes.	Evidence of ponded water over greater than 15% of the rehabilitated area.	Monitor for geotechnical stability and erosion of the landform and remediate if required.
Rehabilitated slopes are not in accordance with the final landform plan.	Rehabilitated slopes within the existing Pine Dale Mine exceed 18° and 30° within the Yarraboldy Extension area.	Regrade slopes prior to contour ripping and drainage works being installed.
Reshaped landform has not been contour ripped.	Reshaped landform has not been contour ripped.	Contour ripped reshaped landform prior to the placement of topsoil.
Rehabilitated landform is not seeded / planted with appropriate seed mix / tube stock.	Seed / tube stock supplied is not commensurate with what was ordered.	Send seed / tube stock back to supplier. Do not sow seed or plant tube stock.
Spontaneous combustion outbreak.	Smoke/heat/odour present.	Mitigate in accordance with the site's spontaneous combustion management procedures (see Section 3.2.1.2).
Inadequate groundcover is present for the phase of rehabilitation.	Less than 70% groundcover or 90% total projected foliage cover is present in the ecosystem establishment phase after 3 years of monitoring.	Test soil pH and EC and conduct soil amelioration if required. If soil amelioration not required, re-sow seed / plant tube stock and monitor performance.
Inadequate species diversity present for the phase of rehabilitation.	- Less than 70% of the species originally sown are present in areas returned to pasture. - Less than 10 native species are present within monitoring quadrat in areas returned to native forest.	Test soil pH and EC and conduct soil amelioration if required. If soil amelioration not required, re-sow additional seed / plant additional tube stock and monitor performance.

Rehabilitation Risk	Monitoring Trigger	Mitigation Measure
Weed presence / density	Noxious weed presence is greater than analogue sites. African Lovegrass represents <10% of pasture sward in pasture rehabilitation areas.	Implement weed control program in accordance with legislation.
The rehabilitated area does not meet its intended sustainable end land use.	The rehabilitated area does not meet its intended sustainable end land use after 5 years of being in this phase.	Review rehabilitation records. Seek specialist advice and liaise with government agencies to determine a solution to move forward and implement the solution.

11. REVIEW, REVISION, AND IMPLEMENTATION

This section must describe the triggers for reviewing and revising the rehabilitation management plan and the process for document management. This section must include (in a table):

■ all statutory triggers for reviewing the rehabilitation management plan in accordance with the development consent conditions, mining lease conditions and other regulatory requirements and statutory approvals

■ the process for ensuring that mining and rehabilitation activities are being conducted in accordance with the rehabilitation management plan.

In accordance with Clause 11 of Schedule 8A of the Mining Regulation 2016, the lease holder (EnergyAustralia) must amend the prepared Rehabilitation Management Plan in the following circumstances:

- As a consequence of an amendment made to the rehabilitation objectives, rehabilitation completion criteria or final landform and rehabilitation plan;
- To reflect any changes to the risk control measures in the Rehabilitation Management Plan that are identified in a rehabilitation risk assessment; and
- Whenever directed in writing to do so by the Secretary.

The lease holder (EnergyAustralia) must ensure that the Rehabilitation Management Plan remains current and relevant to ensure it defines the rehabilitation outcomes to be achieved in relation to the mining area and sets out the strategy to achieve those outcomes.

Whenever any foreseeable hazard is identified that presents a risk to achieving the rehabilitation objectives, the rehabilitation completion criteria and the final landform and rehabilitation plan, the lease holder is required to update the rehabilitation risk assessment and the Rehabilitation Management Plan.

Appendix 1 Risk Assessment

Risk Assessment Detail

Risk Assessment Date(s):	23 November 2021 11:00am - 1:15pm Edits were then made by Energy Australia on 17 December 2012. Edits were made by IEMA on 5 January 2021.
Type of Risk Assessment:	**Rehabilitation Management Plan (RMP) Risk Assessment**
Site:	Pine Dale Mine

Objective:	To identify and risk assess the identified rehabilitation and closure risks for the site, in accordance with: • Rehabilitation Risk Assessment Guideline (NSW Resources Regulator, 2021); and • AS/NZS ISO 31000:2018 Risk management Guidelines; and list risk mitigation actions to reduce the risks.
Context / Assumptions on questions below:	
Quality Assurance Checks	Review the following documents: • Latest Targeted Assessment Programs (TAPs); • Rehabilitation Risk Assessment Guideline (NSW Resources Regulator, 2021); and • Form and Way: Rehabilitation Management Plan for Large Mines (NSW Resources Regulator, 2021). • Most recent site risk assessment/s.
Exclusions/Assumptions:	Only covers care and maintenance operations. Numerous items have been labelled as not applicable based on the site in its current care and maintenance format. This risk assessment should be reviewed if there is a change to site (eg. Final closure or care and maintenance).
Risk Assessment Team Members	
Risk Assessment Team Members (include job title, ie:) - Manager Environment & Community, - Manager Tech Services, - Manager Production / Mining - Manager Commercial	Chris Jones - IEMA (Principal Environmental Scientist) Edwina White - Approvals and Licensing Specialist - Mt Piper Ben Eastwood - NSW Environment Team Leader - Mt Piper Graham Goodwin - Mine Manager

Risk ID	RMP Phase	Applicable RMP Mining Domain	RMP Form and Way Document Aspect (Section)	Unwanted Event / Impact	Applicable (Yes/No)	How the effectiveness of the risk control measures are assessed/validated (Validation Method)	Risk Control Effectiveness	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Treatment Plan
1	General/All Phases	All Domains	General	Insufficient skills and experience of rehabilitation personnel.	Yes	1. Competency based assessments at completion of training, and ongoing TBTs	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
2		All Domains		Lack of clearly defined responsibilities.	Yes	1. Quality assurance process for rehabilitation (still to be developed).	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	Prior to commencing further rehabilitation activities. **Treatment Plan 1.** Develop a quality assurance signoff process for each stage of rehabilitation. This would include field signoff and sign off by the sites representative. This would cover the identified rehabilitation phases. Note, no clearance proposed under current approval. This quality assurance signoff process would be completed prior to commencing further final rehabilitation activities. See 'Rehabilitation Records 'Guideline by the RR.
3		All Domains		Insufficient funding for or prioritisation of rehabilitation activities.	Yes	Copy of bond from RR. Approved bond.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
	Care and Maintenance	All Domains		Inadequate topsoil and capping material quantity available to be salvaged during operations for later use in rehabilitation.	**No**	1. Reporting within the Annual Rehabilitation and Forward Program.	Satisfactory				
4			6.2.1 a. Soils and Materials	Less than adequate soil/materials characterisation undertaken during operations to inform rehabilitation.	Yes	1. Soil results.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
			6.2.1 b. Flora	Less than adequate operational management of resources required to establish the specific flora species required for rehabilitation.	**No**	1. Reporting within the Annual Rehabilitation and Forward Program.	Satisfactory				
5				Clearing in adverse seasonal and weather conditions when salvaging biological resources.	Yes	1. Reporting within the Annual Rehabilitation and Forward Program.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
6			6.2.1 b. Flora 6.2.1 c. Fauna	Less than adequate weed and pest management during care and maintenance phase.	Yes	1. Records of weed management 2. Monitoring records and inspections completed	Satisfactory	2 Minor	E - Rare	**3 (L)**	
			6.2.1 c. Fauna	Less than adequate management of fauna and habitat (e.g. rocks, stag trees) during clearing that impedes approved rehabilitation objectives/criteria.	**No**	1. Reporting within the Annual Rehabilitation and Forward Program.	Satisfactory				
7			6.2.1 d. Rock/Overburden Emplacement	Limited rock/overburden resulting in a materials deficit for rehabilitation.	Yes		Requires Improvement	2 Minor	C - Possible	**8 (M)**	**Treatment Plan 2** Review material balance as part of the Final Closure Plan. Implement changes based on this process.
8			6.2.1 e.Waste Management	Inappropriate management/disposal of waste during operations	Yes	1. Waste records.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
9			6.2.1 f. Geology and Geochemistry	Adverse geochemical/chemical composition of materials such as overburden, interburden, processing wastes, subsoils and topsoils and imported cover materials.	Yes	1. Soil results.	Requires Improvement	2 Minor	C - Possible	**8 (M)**	**Treatment Plan 3** Additional soil and overburden testing required for any future rehabilitation areas. Include PAF and NAF testing. To be completed as part of Final Closure Plan.
10			6.2.1 g. Material Prone to Spontaneous Combustion	Less than adequate management of spontaneous combustion in overburden areas.	Yes	1. Inspection records	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
11			6.2.1 h. Material Prone to Acid Mine Drainage	Less than adequate management of Potential Acid Forming (PAF) materials during operations.	Yes	1. Inspection records. 2. Monitoring results and soil testing. 3. Report indicating at least suspected PAF materials are capped with at least 5 m of inert overburden (not completed, required as part of closure). If no report is completed there needs to be consultation with the Resources Regulator.	Requires Improvement	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 4** Prior to closure Energy Australia to review if there is PAF and whether it buried or capped by 5m of inert overburden in new rehabilitation areas.
12			6.2.1 i. Ore beneficiation waste management	Less than adequate handling and containment of geochemical and geotechnically unsuitable tailings and reject materials.	Yes	1. Rehabilitation monitoring.	Requires Improvement	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 5** Future rehabilitation monitoring reporting to note if any rejects or carbonaceous material is at site. **Treatment Plan 6** Areas of known carbonaceous areas would need to be scalped and removed at closure and disposed in a designated area at site. This area would then need to be capped with overburden.
13			6.2.1 j. Erosion and sediment control	Less than adequate erosion and sediment control management during care and maintenance.	Yes	1. Inspections. 2. Water management maintenance.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
			6.2.1 k. Ongoing management of biological resources for use in rehabilitation	Less than adequate biological resource salvage and maintenance (e.g. subsoil, topsoil, vegetative material, seedbank, rocks, habitat resources) through clearing, salvage and handling practices.	**No**	1. Reporting within the Annual Rehabilitation and Forward Program.	Satisfactory				

Risk ID	RMP Phase	Applicable RMP Mining Domain	RMP Form and Way Document Aspect (Section)	Unwanted Event / Impact	Applicable (Yes/No)	How the effectiveness of the risk control measures are assessed/validated (Validation Method)	Risk Control Effectiveness	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Treatment Plan
14			6.2.1 l. Mine subsidence	Operations subsidence impacts that pose a risk to future rehabilitation.	Yes	1. Inspection records	Satisfactory	2 Minor	E - Rare	**3 (L)**	
15			6.2.1 m. Management of potential cultural and heritage issues	Les than adequate management of cultural and heritage sites during operations/lack of awareness of cultural heritage obligations.	Yes	1. Records if artefacts were found.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
16			6.2.1 n. Exploration activities	Less than adequate management of exploration activities which poses a risk to future rehabilitation.	Yes		Satisfactory	2 Minor	E - Rare	**3 (L)**	**Treatment Plan 7** Energy Australia to review piezometer locations at closure. Possibility of removing and grouting.
17	Decommissioning Phase	Domain 1 - Infrastructure Domain 3 - Water Management Area	6.2.2 a. Site Security	Public safety risks due to less than adequate site security during decommissioning.	Yes	1. Records of any community interactions re: site security.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
18			6.2.2 b. Infrastructure to be removed or demolished	Hazards associated with retained infrastructure (e.g. dams, site services).	Yes	1. Details in Final Closure Plan. This will outline the roads / infrastructure to be kept. 2. Site waste and demolition records prior to closure	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 8 -** Development of the Final Closure Plan, including an assessment of current obligations around retainment or removal of infrastructure at closure. Replacing with commitment of *" at closure all infrastructure is to be removed unless there is an agreement with the Secretary of DPIE".* To be looked at in the Closure Plan. *See Schedule 3 Condition 53 of the Project Approval.* Energy Australia notes that the Infrastructure to be kept includes roads, fencing, some dams and pipes.
19				Generation of material and waste products from the demolition process.	Yes		Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
20				Less than adequate decommissioning/ removal/augmentation of the mine water management system including any dams prescribed by the Dams Safety Act 2015.	Yes		Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
21				Risks to public safety and the environment from any structures remaining in place.	Yes	1. Details in Final Closure Plan	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
			6.2.2 c. Buildings, structures and fixed plant to be retained	Risks associated with retained heritage items.	**No**						
22			6.2.2 d. Management of contaminated material/tailings.	Contamination resulting from decommissioning activities (e.g. storage and use of hydrocarbons/chemicals, drilling fluids, spillage of dirty or produced saline water, brine, sewage). Existing contamination.	Yes	1. Details in Final Closure Plan. Contamination Assessment and Demolition Assessment (not yet completed).	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 9** Contamination Assessment required as part of the closure process.
				Tailings strength properties/performance requirements are not well understood.	**No**						
23			6.2.2 e. Hazardous materials management	Removal of hazardous items (e.g. radioactive density gauges) or materials (e.g. asbestos)	Yes		Satisfactory	2 Minor	E - Rare	**3 (L)**	
			6.2.2 f. Underground Infrastructure	N/A to this site	**No**						
24	Landform Establishment Phase	Domain 1 - Infrastructure Domain 3 - l Water Management Area Domain 5 - Active Mining	6.2.3 a. Water management infrastructure	Less than adequate rehabilitation of water management infrastructure.	Yes	1. Rehabilitation monitoring and inspection records.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 10** Final closure plan to include water management designs and future water licensing if required.
25				Insufficient future water licensing requirements for water retained within the final void(s) following mine closure.	Yes	1. Details of water management in Final Closure Plan. 2. Monitoring results.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
26				Less than adequate studies associated with surface and groundwater management (e.g. creek diversions, geomorphological and hydraulic modelling, aquatic ecological assessments, final void water balance, groundwater modelling, geochemical studies, etc.)	Yes	1. Details of water management in Final Closure Plan (including study). 2. Monitoring results.	Satisfactory	2 Minor	E - Rare	**3 (L)**	
27			6.2.3 b. Final landform construction: general requirements	Geotechnical/geochemical risks associated with landform establishment.	Yes	1. Soil testing results. 2. Records of ameliorants. 3. Monitoring results.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
28				Less than adequate landform design (e.g. Slopes not as per the Project Approval).	Yes	1. Engineering design. 2. Quality assurance process for rehabilitation (still to be developed).	Requires Improvement	2 Minor	C - Possible	**8 (M)**	**Treatment Plan 11** Slopes and stability to be assessed as part of the final Closure Plan.
29				Vegetation mix in final landform is different to the Project Approval	Yes	1. Quality assurance process for rehabilitation (still to be developed).	Requires Improvement	2 Minor	C - Possible	**8 (M)**	**Treatment Plan 12** Seek advice from a rehabilitation specialist in regards to the most suitable species mix for any future rehabilitation. Confirm revegetation plan with regulators as part of closure planning.

Risk ID	RMP Phase	Applicable RMP Mining Domain	RMP Form and Way Document Aspect (Section)	Unwanted Event / Impact	Applicable (Yes/No)	How the effectiveness of the risk control measures are assessed/validated (Validation Method)	Risk Control Effectiveness	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Treatment Plan
30		Area (Open Cut Void)		Less than adequate visual amenity of the final landform during landform establishment Phase.	Yes	1. Engineering design. 2. Quality assurance process for rehabilitation (still to be developed).	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
31				Final landform unsuitable for final land use (e.g. large rocks present affecting cultivation, settlement and surface subsidence leading to extended ponding).	Yes	1. Engineering design. 2. Quality assurance process for rehabilitation (still to be developed).	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
32			6.2.3 c. Final landform construction: reject emplacement areas and tailings dams	Lack of availability of suitable materials for encapsulation or capping of adverse materials. Tailings and rejects.	Yes	1. Engineering design. 2. Quality assurance process for rehabilitation (still to be developed). Includes capping records.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
33			6.2.3.d. Final landform construction: final voids, highwalls and low walls	Final voids, highwalls and low walls pose a risk to public safety and/or sterilises the land available for future final land uses	Yes	1. Copy of the Slopes, geotechnical and stability assessment required for the Final Closure Plan (not yet required). 2. Execution of closure plan report including validation of controls (not yet required).	Satisfactory	2 Minor	E - Rare	**3 (L)**	
34				Lack of detail around final void management strategy (e.g. water balance, water quality, geotechnical assessments, future water licencing requirements).	Yes	1. Execution of closure plan report including validation of controls (not yet required).	Satisfactory	2 Minor	E - Rare	**3 (L)**	
			6.2.3 e. Construction of creek/river diversion works	Less than adequate geomorphological and hydraulic modelling and aquatic ecological assessments associated with creek diversions.	**No**	1. Monitoring. 2. Records of inspections	Satisfactory				
35	Growth Medium Development Phase	Domain 1 - Infrastructure Domain 3 - Water Management Area Domain 5 - Active Mining Area (Open Cut Void)	Section 6.2.4 Growth Medium Development	Lack of information regarding the geochemical nature of the substrate and associated materials (e.g. subsoils, topsoils, organic additives, overburden surface).	Yes	1. Soil results. 2. Monitoring of existing rehabilitation	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
36				Lack of information around ameliorants and or strategies required to address constraints and or enhance the substrate.	Yes	1. Soil results. 2. Records of rehabilitation maintenance and monitoring for older rehabilitation areas. 3. Quality assurance process for future rehabilitation (still to be developed).	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
37				Less than adequate weed control techniques during growth medium development phase.	Yes	1. Records of weed management through spraying and monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
38				Less than adequate management of rehabilitation areas to minimise degradation of the substrate, dust generation and erosion should adverse conditions delay vegetation establishment.	Yes	1. Monitoring and inspection records. 2. Quality assurance process for rehabilitation (still to be developed).	Satisfactory	2 Minor	E - Rare	**3 (L)**	
39				Less than adequate use of features to augment habitat value (e.g. structures such as tree hollows, logs and other woody debris, ponds).	Yes	1. Nesting box records to be kept - GPS locations. 2. Include nesting boxes in future rehabilitation monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 13** Nesting boxes to be installed once trees establish. Using services of a specialist. To be included in the Final Closure Plan.
40				Subsoil and topsoil deficit during rehabilitation activities.	Yes	1. Records of ameliorants kept for future rehabilitation. 2. Quality assurance process for rehabilitation (still to be developed).	Requires Improvement	2 Minor	B - Likely	**12 (M)**	**Treatment Plan 14** Final Closure Plan to look at reviewing subsoil and soil depth, as well as criteria. From RR 'Rehabilitation Controls' Guideline'. 2. Final Closure Plan needs to look at alternatives for topsoil use.
41				Less than adequate handling and management of mine materials (e.g. overburden, tailings, reject materials etc.) to address potential geochemical and geotechnical constraints for rehabilitation.	Yes	1. Monitoring and inspection records. 2. Quality assurance process for rehabilitation (still to be developed).	Satisfactory	2 Minor	E - Rare	**3 (L)**	
42	Ecosystem and Land Use Establishment Phase	Domain 1 - Infrastructure Domain 3 - Water Management Area Domain 5 - Active Mining Area (Open Cut Void)	6.2.5. Ecosystem and land use establishment	Less than adequate seasonal considerations (e.g. drought conditions; excessive heat) factored into the process to optimise conditions to support the initial establishment of the target vegetation.	Yes	1. Records of maintenance. 2. Quality assurance process for rehabilitation (still to be developed). 3. Records of seed mix and output	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
43				Less than adequate revegetation methodologies (e.g. direct seeding, tree plantings, use of a seed drill).	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring. 3. Records of seed mix and output.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
44				Inadequate type and range of species planted, including short-lived pioneer species, to achieve the intended revegetation outcome.	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring. 3. Records of seed mix and output.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	***See Treatment Plan 12*** Seek advice from a rehabilitation specialist in regards to the most suitable species mix for any future rehabilitation. Confirm revegetation plan with regulators as part of closure planning.
45				Unsuitable seed sourcing, handling, treating or application.	Yes	1. Records of maintenance. 2. Quality assurance process for rehabilitation (still to be developed). 3. Records of seed mix and output	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	

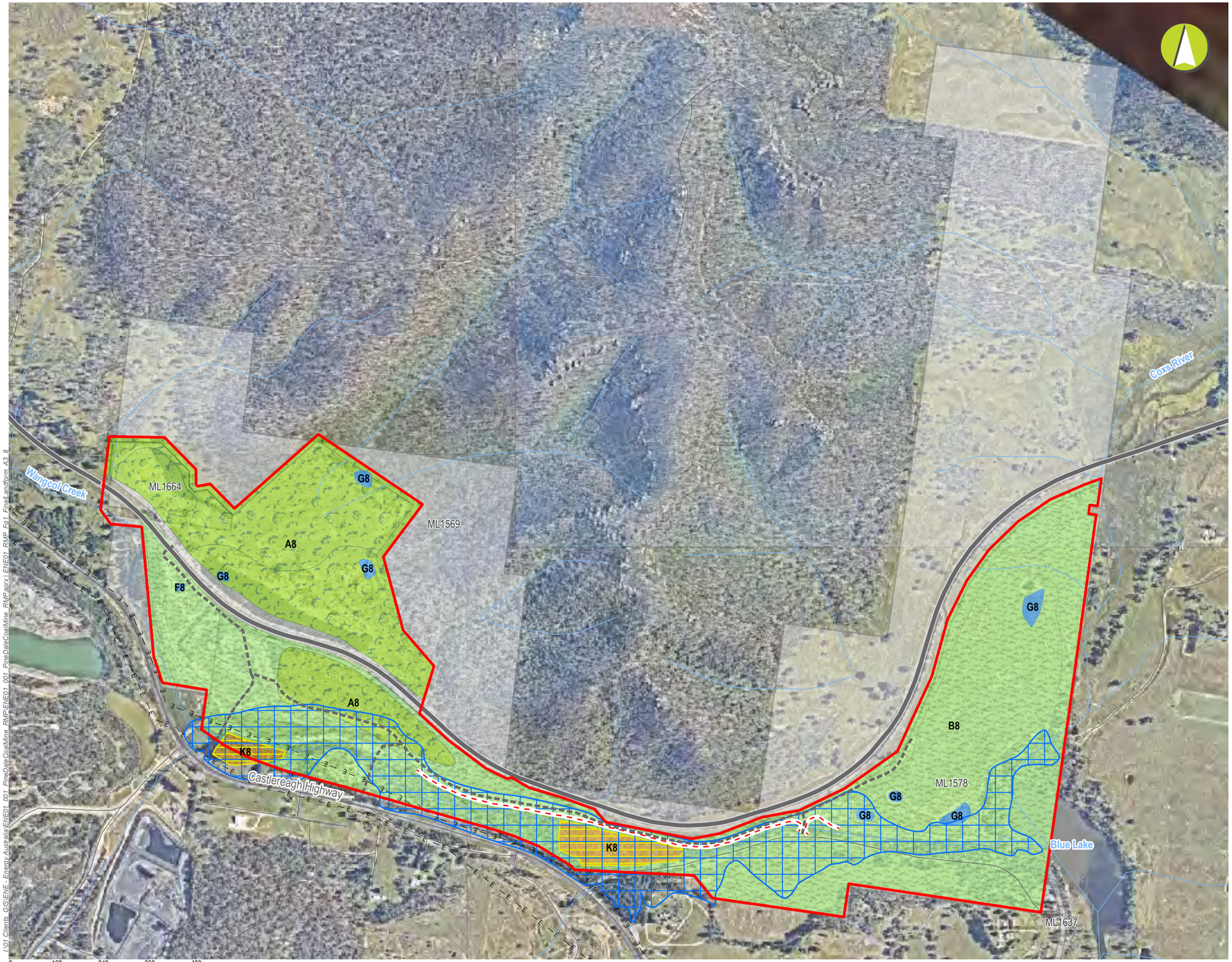
Risk ID	RMP Phase	Applicable RMP Mining Domain	RMP Form and Way Document Aspect (Section)	Unwanted Event / Impact	Applicable (Yes/No)	How the effectiveness of the risk control measures are assessed/validated (Validation Method)	Risk Control Effectiveness	Expected Risk Consequence	Risk Likelihood	Current Risk Rating	Treatment Plan
46				Inappropriate (or no) use of cover crops to protect the substrate whilst the target revegetation cover is established.	Yes	1. Records of maintenance. 2. Quality assurance process for rehabilitation (still to be developed). 3. Records of seed mix and output	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
47				Unsuitable/lack of initial measures adopted (e.g. watering) to promote vegetative establishment and growth.	Yes	1. Water use records when used in rehabilitation.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
48				Inadequate weed management and pest animal control to protect juvenile vegetation (all phases)	Yes	1. Records of weed management	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
49	Ecosystem and Land Use Development Phase	Domain 1 - Infrastructure Domain 3 - Water Management Area Domain 5 - Active Mining Area (Open Cut Void)	6.2.6. Ecosystem and land use development	Less than adequate weed and feral animal control of rehabilitation areas.	Yes	1. Rehabilitation and ecological monitoring. 2. Records of weed and feral animal management.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
50				Less than adequate erosion and drainage	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
51				Less than adequate environmental monitoring and management of surface water, groundwater, ecology, land capability.	Yes	1. Records of monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	**Treatment Plan 15** Proposed environmental and rehabilitation monitoring to be reviewed as part of the Final Closure Plan.
52				Less than adequate re-seeding/planting of rehabilitation areas that may have failed or where key species are under-represented (e.g. lack of germination, high plant mortality rate)	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring. 3. Records of seed mix and output.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
53				Lack of maintenance fertilising	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring. 3. Records of mulch, fertiliser and ameliorants.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
54				Less than adequate repair of fence lines, access tracks and other general related land management activities.	Yes	1. Rehabilitation monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
55				Long term water quality and quantity issues (e.g. acid-drainage, high salinity).	Yes	1. Results for soil and water testing. 2. Rehabilitation monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
56				Damage to rehabilitation (e.g. fauna, domestic stock, vandalism, vehicular interactions, bushfire, insects and plant disease)	Yes	1. Rehabilitation monitoring.	Satisfactory	2 Minor	D - Unlikely	**5 (L)**	
57				Re-disturbance of established rehabilitation areas.	Yes	1. Mine planning records	Satisfactory	2 Minor	E - Rare	**3 (L)**	
58				Criteria are not realistic to meet	Yes	1. Rehabilitation monitoring.	Satisfactory	2 Minor	C - Possible	**8 (M)**	**Treatment Plan 16** All completion criteria to be assessed in the Final Closure Plan.
59				Limited vegetation structural development and habitat for targeted fauna species.	Yes	1. Quality assurance process for rehabilitation (still to be developed). 2. Rehabilitation monitoring.	Satisfactory	2 Minor	C - Possible	**8 (M)**	
	Mine Subsidence Affected Areas	N/A	6.3. Rehabilitation of areas affected by subsidence		**No**						

Rating	E - Rare	D - Unlikely	C - Possible	B - Likely	A - Almost Certain
5 Catastrophic	15 (M)	19 (H)	22 (H)	24 (H)	25 (H)
4 Major	10 (M)	14 (M)	18 (H)	21 (H)	23 (H)
3 Moderate	6 (L)	9 (M)	13 (M)	17 (H)	20 (H)
2 Minor	3 (L)	5 (L)	8 (M)	12 (M)	16 (M)
1 Negligible	1 (L)	2 (L)	4 (L)	7 (M)	11 (M)

Appendix 2 RMP Plans

Rehabilitation Management Plan

Plan 1 Final Landform and Rehabilitation Plan Features



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LEGEND

- Project Approval Boundary
- Electricity Transmission Line
- Road
- Watercourse
- Flood Prone Land

Current Authorisations

- Coal - Current Titles

Final Landform Feature

- Existing Pine Plantation
- Private coal haul road to be retained
- Track to be retained
- Windrow to be retained

Final Landuse Domain

- Domain A - Native Ecosystem
- Domain B - Agricultural – Grazing
- Domain G - Water Storage (Excluding Final Void)
- Domain K - Other

Source: Project Approval Boundary and
Current Authorisations from Energy Australia (2021).
Roads, watercourses and electricity transmission lines from LPI (2021).
Aerial imagery from Nearmap (capture date 14-04-2021).

Pine Dale Coal Mine

Final Landform and Rehabilitation Plan Features
PLAN 1

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine RMP
Data theme submission ID No.	1747
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

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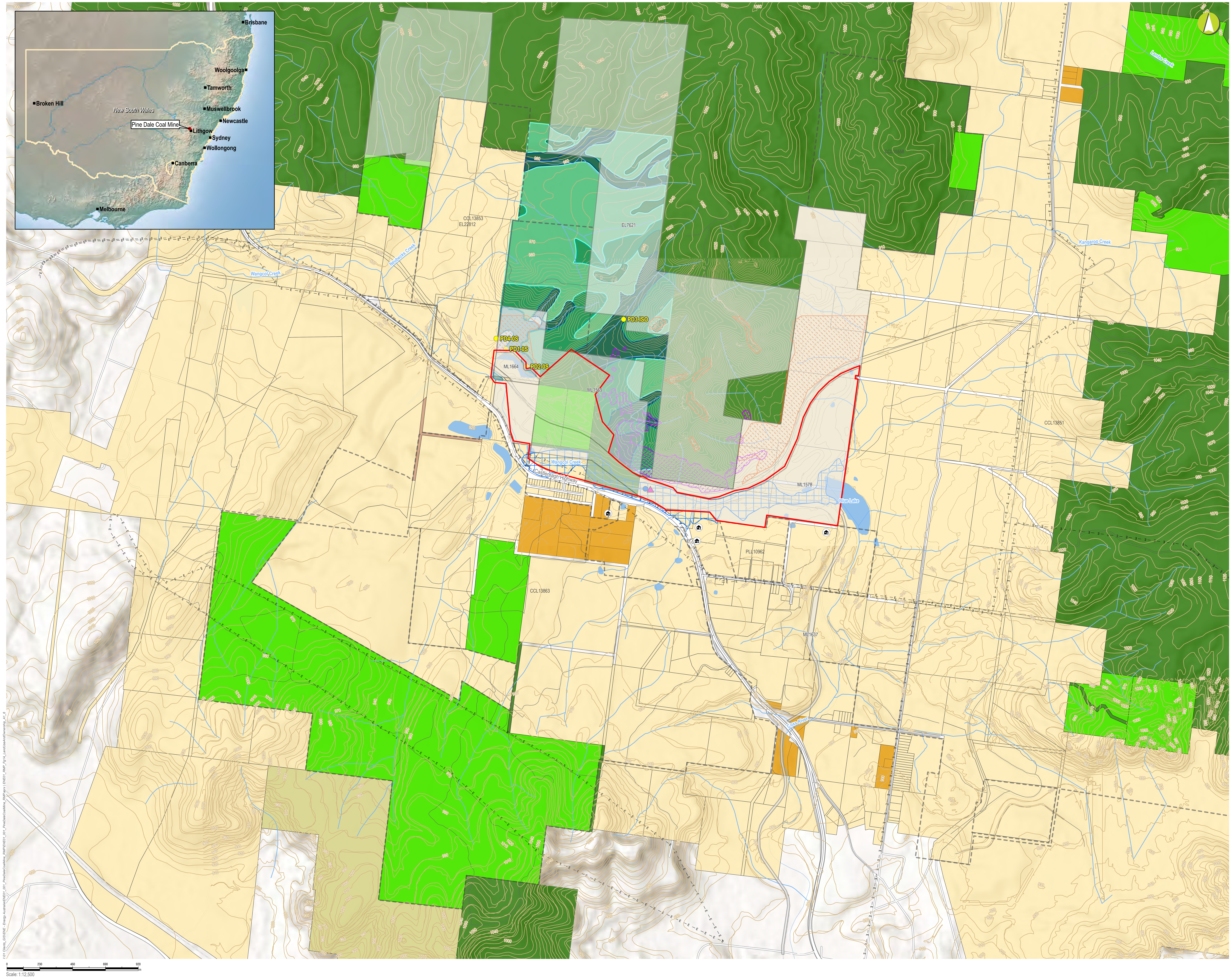
Figure 1A Land Ownership



LEGEND

- Project Approval Boundary
- Current Landform Contours
- Electricity Transmission Line
- Road
- Watercourse
- Waterbody
- Flood Prone Land

Current Authorisations
- Coal - Current Titles
- Surrounding Mine Titles
- Other Owned Residence

Heritage Feature
- Aboriginal Heritage Site

Threatened Species
- *Derwentia blakelyi*
- *Eucalyptus aggregata*

Specialised Habitat Type
- Bursaria Habitat
- Ecotone Habitat

Vegetation Community
- 1a - Red Stringybark
- 1b - Red Stringybark
- 2 - Red Stringybark
- 3 - Ribbon Gum
- 4 - Red Stringybark
- 5 - Snow Gum

Land Ownership
- Crown
- Freehold
- Local Government Authority
- NSW Government
- State Forest

NOTE: Entire site sits within Lithgow City Council Local Government Area and Hawkesbury Catchment Area

Pine Dale Coal Mine

Land Ownership
FIGURE 1A

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine RMP
Data theme submission ID No.	1745
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

Source: Buildings, Project Approval Boundary and Current Authorisations from Energy Australia (2021). Roads, watercourses, electricity transmission lines and Land Owner information from LPI (2021). Aerial imagery from ArcGIS Online (capture date unknown).

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Figure 1B Land Use

LEGEND

- Project Approval Boundary
- Current Landform Contours
- Electricity Transmission Line
- Road
- Watercourse
- Waterbody
- Flood Prone Land

Current Authorisations
- Coal - Current Titles
- Surrounding Mine Titles

Vegetation Community
- 1a - Red Stringybark
- 1b - Red Stringybark
- 2 - Red Stringybark
- 3 - Ribbon Gum
- 4 - Red Stringybark
- 5 - Snow Gum

Land Use
- 1.3.0 Other minimal use
- 2.1.0 Grazing native vegetation
- 2.2.0 Production native forests
- 3.1.0 Plantation forests
- 3.2.0 Grazing modified pastures
- 3.3.0 Cropping
- 5.4.0 Residential and farm infrastructure
- 5.5.0 Services
- 5.6.0 Utilities
- 5.7.0 Transport and communication
- 5.8.0 Mining
- 6.2.0 Reservoir/dam
- 6.3.0 River
- 6.5.0 Marsh/wetland

NOTE: Entire site sits within Lithgow City Council Local Government Area and Hawkesbury Catchment Area

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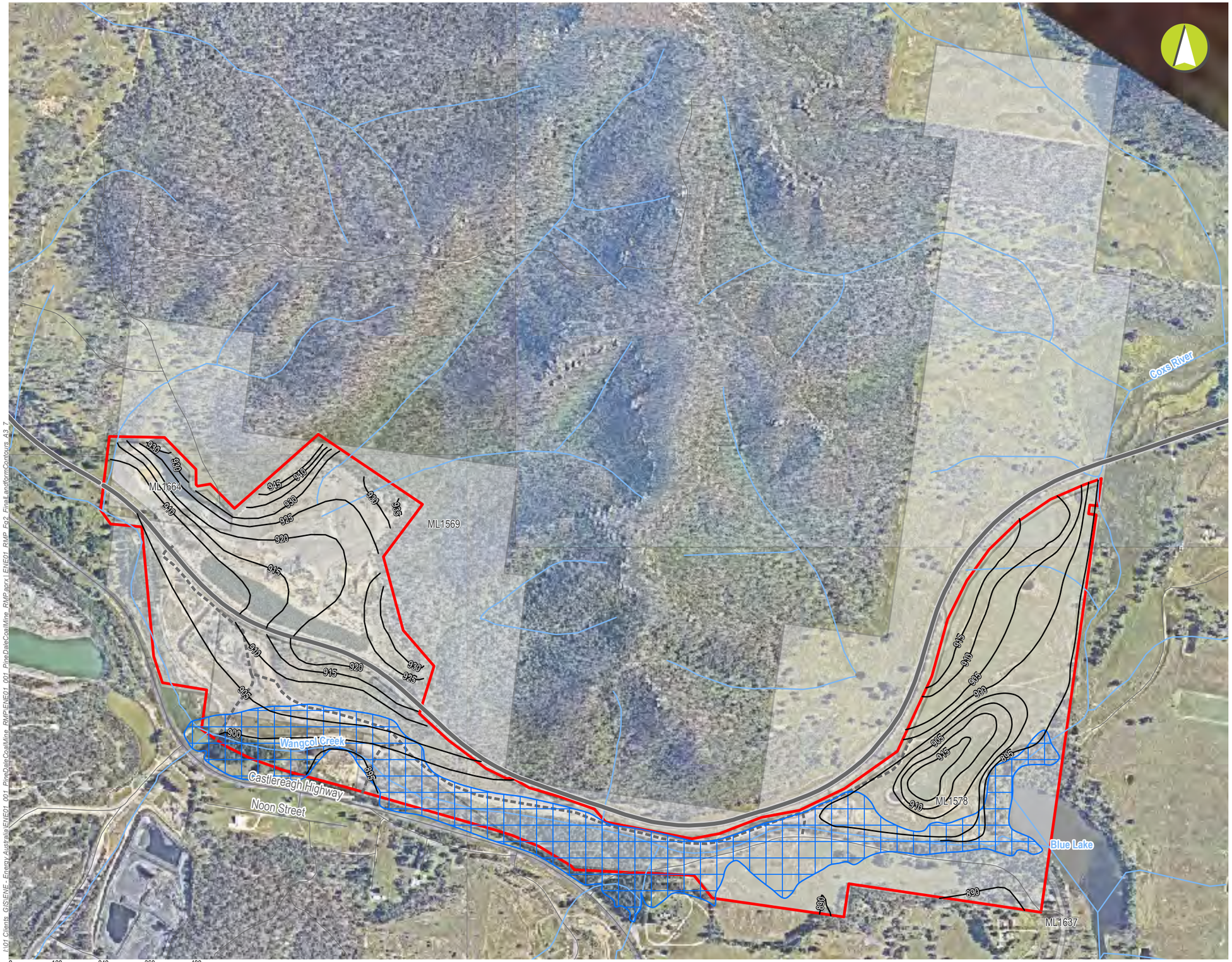
Source: Buildings, Project Approval Boundary and Current Authorisations from Energy Australia (2021).
Land Use from DPIE (2017).
Roads, watercourses, electricity transmission lines and Aerial imagery from ArcGIS Online (capture date unknown).

Pine Dale Coal Mine

Land Use
FIGURE 1B

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine RMP
Data theme submission ID No.	1745
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

Plan 2 Final Landform and Rehabilitation Plan Contours



LEGEND

- Project Approval Boundary
- Final Landform Contours
- Private Haul Road
- Track
- Road
- Watercourse
- Flood Prone Land

Current Authorisations

- Coal - Current Titles

Pine Dale Coal Mine

Final Landform and Rehabilitation Plan
Contours
PLAN 2

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine RMP
Data theme submission ID No.	1748
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

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Source: Project Approval Boundary and
Current Authorisations from Energy Australia (2021).
Roads, watercourses and electricity transmission lines from LPI (2021).
Aerial imagery from Nearmap (capture date 14-04-2021).

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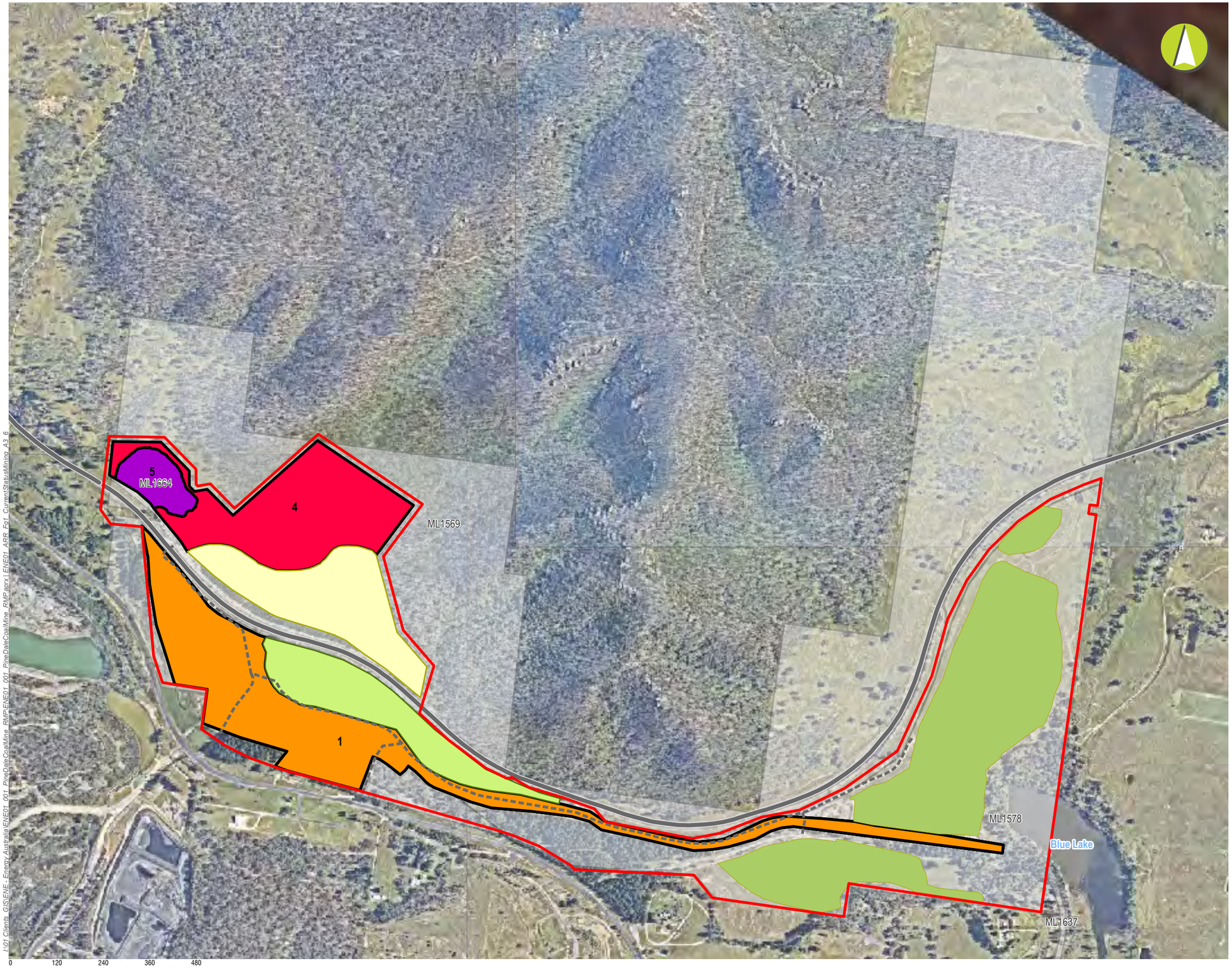
Annual Rehabilitation Report and Forward Program

Note, the Annual Rehabilitation Report and Forward Program Plans have also been included in Appendix 2 of this RMP for completion of information.

Plan 1A Current Status of Mining and Rehabilitation



LEGEND

- Project Approval Boundary
- Private Haul Road
- Track

Current Authorisations

- Coal - Current Titles

Mining Domain Type

- Domain 1 - Infrastructure Area
- Domain 4 - Overburden Emplacement Area
- Domain 5 - Active Mining Area (Open cut void)

Rehabilitation Phase

- Landform Establishment
- Growth Media Development
- Ecosystem and Land Use Establishment

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Sheet Size : A3

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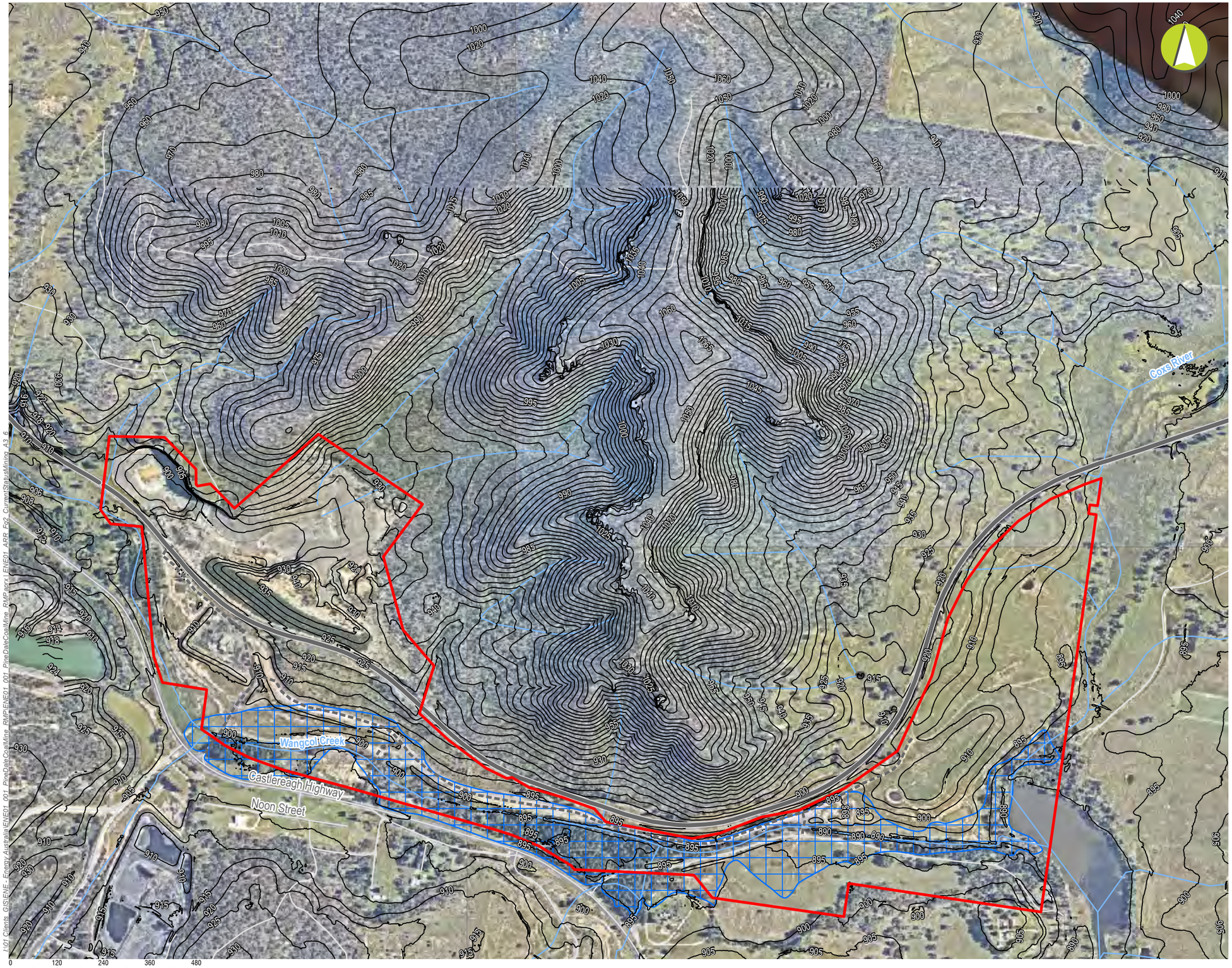
Source: Project Approval Boundary and Current Authorisations from Energy Australia (2021). Roads and watercourses from LPI (2021). Aerial imagery from Nearmap (capture date 14-04-2021).

Pine Dale Coal Mine

Current Status of Mining and Rehabilitation PLAN 1A

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine ARR
Data theme submission ID No.	1743/1749
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

Plan 1B Current Landform Contours



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Sheet Size : A3

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EnergyAustralia

LEGEND

- Project Approval Boundary
- Current Landform Contours
- Private Haul Road
- Road
- Track
- Watercourse
- Flood Prone Land

Source: Project Approval Boundary and Current Authorisations from Energy Australia (2021). Roads and watercourses from LPI (2021). Aerial imagery from Nearmap (capture date 14-04-2021).

Pine Dale Coal Mine

Current Landform Contours
PLAN 1B

Mine name	Pine Dale Mine (ENE01-001)
Plan name	Pine Dale Mine ARR
Data theme submission ID No.	1746
Spatial Reference	GDA 1994 MGA Zone 56
Plan date (date created)	11/05/2022

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Appendix 3 Draft RMP Consultation and Agency Comments

From:	Resources Regulator
To:	Lulham, Jarvis
Cc:	Eastwood, Ben
Subject:	MAAG0014178 | Pine Dale Rehabilitation Management Plan DRAFT
Date:	Thursday, 9 June 2022 3:08:13 PM
Attachments:	viewourvideos.pngx default_banner.jpg RegionalNSWLogo.pngx visitourwebsite.pngx subscribe.pngx

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Good Afternoon Jarvis

I refer to the recently submitted Draft Pinedale Mine Rehabilitation Management Plan (dRMP).

I wish to advise that the Resources Regulator will not be providing advice in respect to the draft.

It is noted that the dRMP contains the Rehabilitation Objectives Statement (ROBJ) and Rehabilitation Completion Criteria (RCC) statement.

The Resources Regulator will review, assess and determine the ROBJ and RCC once submitted for approval pursuant to clauses 13 and 15 in Schedule 8A of the Mining Regulation 2016.

The lodgement of the rehabilitation completion criteria statement (RCC) is not required until no later than when a forward program is submitted to us which relates to completion of rehabilitation during the period covered by that forward program [see clause 15(3) of Schedule 8A of the Mining Regulation 2016].

The rehabilitation management plan (RMP) should include proposed versions of the Rehabilitation Objectives Statement (ROBJ) and Rehabilitation Completion Criteria (RCC) statement [refer clause 10(2) in Schedule 8A of the Mining Regulation 2016].

If you require further information, please do not hesitate to contact me or review the following links for additional information relating to RMP's, ROBJ, RCC's and Forward Plans.

https://www.resourcesregulator.nsw.gov.au/sites/default/files/documents/form-and-way-annual-rehabilitation-report-and-forward-program-for-large-mines.pdf

https://www.resourcesregulator.nsw.gov.au/sites/default/files/documents/form-and-way-rehabilitation-objectives-completion-criteria-and-final-landform-and-rehabilitation-plan-for-large-mines.pdf

Regards,

Christopher Hammersley
Inspector Environment
MAI - Team 1 | Resources Regulator

M 0429 987 324

Department Regional NSW

The Department of Regional New South Wales 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.

Ref:MSG0691458_CoD6mfdxiGVskSGjAAj8

DOC22/373930-1

Jarvis Lulham
Environment Graduate
EnergyAustralia Pty Ltd

Via e-mail: jarvislulham@energyaustralia.com.au

24 May 2022

Dear Mr Lulham

Pine Dale Mine Rehabilitation Management Plan
EPL 4911 Enhance Place Pty Ltd

I refer to the draft Pine Dale Mine Rehabilitation Management Plan for Enhance Place Pty Ltd, received by the NSW Environment Protection Authority (EPA) on 13 May 2022, and your request for the EPA comment on this draft plan. Thank you for providing the plan in accordance with the requirements of the Mining Act 1992. The Mining Amendment (Standard Conditions of Mining Leases - Rehabilitation) Regulation 2021 which requires that the plan be prepared in consultation with EPA.

The EPA encourages the development of Environmental Management Plans/Programs to ensure that proponents have determined how they will meet their statutory obligations and environmental objectives as specified by any Project/Development Approval and/or the conditions of an environment protection licence. Please note however that it is not the EPA's role to endorse these plans given the EPA sets conditions/criteria for environmental protection and management and therefore cannot be directly involved in the development of strategies to comply with such conditions/criteria.

The EPA has reviewed the draft mine rehabilitation management plan on this occasion however and has no specific comments to make about the content of the plan.

If you have any specific questions regarding this matter, please contact Ms Hannah Copeland via email at info@epa.nsw.gov.au.

Yours sincerely

SHERIDAN LEDGER
A/Manager
Regulatory Operations Regional South

Jarvis Lulham
Environment Graduate
Mt Piper Power Station
jarvis.lulham@energyaustralia.com.au

Our ref: DOC22/478970

Dear Jarvis

BCS review of the draft Pine Dale Mine Rehabilitation Management Plan

Thank you for your e-mail dated 2 June 2022 to the Biodiversity, Conservation and Science Directorate (BCS) of the Department of Planning and Environment (DPE) inviting comments on the draft Rehabilitation Management Plan (RMP) for the Pine Dale Mine.

BCS has reviewed the RMP and has identified several key recommendations:

1. Identify specific rehabilitation objectives and completion criteria for biodiversity values
2. Specify rehabilitation actions for ecosystem and land use establishment, and development
3. Complete the rehabilitation implementation schedule
4. Implement a robust quality assurance process

BCS's recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**.

If you require any further information regarding this matter, please contact Rowan Murphy, Senior Conservation Planning Officer, via rowan.murphy@environment.nsw.gov.au or 0400 337 662.

Yours sincerely

Samantha Wynn

Samantha Wynn
Senior Team Leader Planning North West
Biodiversity, Conservation and Science Directorate
17 June 2022

Attachment A – BCS's recommendations

Attachment B – BCS's detailed comments

BCS's recommendations

Pine Dale Mine – Rehabilitation Management Plan

Acronym / term	Definition
BC Act	*Biodiversity Conservation Act 2016*
BC Regulation	*Biodiversity Conservation Regulation 2017*
BCS	The Biodiversity, Conservation and Science Directorate of the Department of Planning and Environment.
Form and Way	*Form and Way: Rehabilitation management plan for large mines* (NSW Resources Regulator, 2021)
PCT	Plant Community Type
RMP	Pine Dale Mine Rehabilitation Management Plan 2022 (EnergyAustralia NSW, 2021)
SMART	Specific, Measurable, Assignable, Realistic, Timebound

Recommendations

1.1 Final Land Use Domain A – Native Ecosystem should be divided into multiple rehabilitation zones based upon contemporary ecological advice.

1.2 Rehabilitation objectives for final land use Domain A – Native Ecosystem should relate to the relevant defined biodiversity values. A single rehabilitation objective could relate to multiple biodiversity values. For example:

> Increase habitat suitability and connectivity for endemic fauna facilitating threatened species movement and abundance in the rehabilitated areas.

1.3 Specific and measurable indicators for each of the rehabilitation objectives need to be identified. For example:

a) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 731: "Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills; South Eastern Highlands Bioregion" at Rehabilitation Zone A.

b) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 677: "Black Gum grassy woodland of damp flats and drainage lines of the eastern Southern Tablelands; South Eastern Highlands Bioregion" at Rehabilitation Zone B.

1.4 Specific, measurable, and achievable completion criteria need to be identified for each of the rehabilitation objectives. For example:

a) At least three tree species associated with PCT 731 persisting at a density of at least 25 per cent cover within Rehabilitation Zone A after five years following completion of initial planting / seeding of this zone.

b) At least two tree species associated with PCT 677 persisting at a density of at least 10 per cent cover within Rehabilitation Zone B after five years following completion of initial planting / seeding of this zone.

2.1 Provide specific rehabilitation actions for ecosystem and land use establishment (section 6.2.5), and separately for ecosystem and land use development (section 6.2.6).

   a. Link these actions to specific rehabilitation objectives and completion criteria.
   b. Ensure the actions adhere to the SMART principles.

3.1 Provide an undated rehabilitation schedule detailing the estimated time to complete proposed rehabilitation activities. The trigger for this rehabilitation schedule may be the date any decision is made for closure of the mine.

4.1 Implement a robust quality assurance process including independent audits of performance against performance targets and completion criteria by qualified auditors of environmental management systems.

Attachment B

BCS's detailed comments

Pine Dale Mine – Rehabilitation Management Plan

1. Identify specific rehabilitation objectives and completion criteria for biodiversity values

The *Form and Way: Rehabilitation management plan for large mines* (NSW Resources Regulator, 2021) (Form and Way) provides a framework for preparing a rehabilitation management plan (RMP). The purpose of this framework is to set clear, achievable, and enforceable requirements for mine site rehabilitation.

It requires specific rehabilitation objectives for each mining domain and associated final land use domain (see section 4.1). Rehabilitation objectives must (as a minimum) demonstrate that each final land use domain will be returned to a condition capable of achieving the proposed final land use. While completion criteria set the target values for key attributes (indicators) proposed to demonstrate that the rehabilitation objectives have been met.

Table 7 of the *Pine Dale Mine Rehabilitation Management Plan 2022* (EnergyAustralia NSW, 2021) (the RMP) provides rehabilitation objectives, indicators, and completion criteria for final land use domains. These have been drawn from the relevant historic and extant approvals for mining operations. However, the objectives, indicators, and criteria for the Final Land Use Domain A – Native Ecosystem are not specific, measurable, or therefore, auditable.

Relevant biodiversity values for native ecosystems are provided in s1.5 of the *Biodiversity Conservation Act 2016* (BC Act) and cl1.4 of the *Biodiversity Conservation Regulation 2017* (BC regulation). These are:

- **vegetation integrity**—being the degree to which the composition, structure, and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state.
- **habitat suitability**—being the degree to which the habitat needs of threatened species are present at a particular site.
- **threatened species abundance**—being the occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site.
- **vegetation abundance**—being the occurrence and abundance of vegetation at a particular site.
- **habitat connectivity**—being the degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range.
- **threatened species movement**—being the degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle.
- **water sustainability**—being the degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.

Final Land Use Domain A – Native Ecosystem should be divided into multiple rehabilitation zones based upon contemporary specialist advice referring to environmental factors such as soil type, threatened species habitat requirements, prior and surrounding vegetation communities, etc. For example, see Figure 1A – Land Ownership within Appendix 2 of the RMP.

The following recommendations aim to assist EnergyAustralia NSW to produce a document that is easy for operational staff to implement and provides a clear, concise, and auditable rehabilitation framework.

Recommendations

1.1 Final Land Use Domain A – Native Ecosystem should be divided into multiple rehabilitation zones based upon contemporary ecological advice.

1.2 Rehabilitation objectives for final land use Domain A – Native Ecosystem should relate to the relevant defined biodiversity values. A single rehabilitation objective could relate to multiple biodiversity values. For example:

Increase habitat suitability and connectivity for endemic fauna facilitating threatened species movement and abundance in the rehabilitated areas.

1.3 Specific and measurable indicators for each of the rehabilitation objectives need to be identified. For example:

c) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 731: "Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills; South Eastern Highlands Bioregion" at Rehabilitation Zone A.

d) Increased canopy cover comprised of species associated with Plant Community Type (PCT) 677: "Black Gum grassy woodland of damp flats and drainage lines of the eastern Southern Tablelands; South Eastern Highlands Bioregion" at Rehabilitation Zone B.

1.4 Specific, measurable, and achievable completion criteria need to be identified for each of the rehabilitation objectives. For example:

c) At least three tree species associated with PCT 731 persisting at a density of at least 25 per cent cover within Rehabilitation Zone A after five years following completion of initial planting / seeding of this zone.

d) At least two tree species associated with PCT 677 persisting at a density of at least 10 per cent cover within Rehabilitation Zone B after five years following completion of initial planting / seeding of this zone.

2 Specify rehabilitation actions for ecosystem and land use establishment, and development

The Form and Way requires a description of how the target vegetation associated with the final land use will be established and subsequently managed through the ecosystem and land use development phase.

Sections 6.2.5 and 6.2.6 of the RMP do not provide specific rehabilitation actions that are directly linked to specific rehabilitation objectives and completion criteria. Rehabilitation actions should:

- Address a specific rehabilitation objective
- Adhere to the SMART principles:
  - **Specific** – exactly what will be done, where, with which materials?
  - **Measurable** – what is the target range, performance goals, completion criteria?
  - **Assignable** – who is responsible for the action?
  - **Realistic** – is the action achievable, is it funded, is it evidence based?
  - **Timebound** – what will trigger the start of the action? How long is it estimated to take?
- Inform the rehabilitation monitoring program.

Recommendation

2.1 Provide specific rehabilitation actions for ecosystem and land use establishment (section 6.2.5), and separately for ecosystem and land use development (section 6.2.6).

c. Link these actions to specific rehabilitation objectives and completion criteria.

d. Ensure the actions adhere to the SMART principles.

3 Complete the rehabilitation implementation schedule

The Pine Dale Mine – Expansion approval (10_0041) requires progressive rehabilitation of the site, as soon as reasonably practicable following disturbance (at Condition 54 of Schedule 3). The mine is currently operated under "care and maintenance" by Enhance Place Pty Ltd.

The Form and Way requires a description of the rehabilitation schedule over the life of the mine, from the commencement of the rehabilitation management plan until lease relinquishment.

The draft RMP provides at page 41:

> *This section is not applicable to Pine Dale as over the next three years there is no planned disturbance or rehabilitation, with this covered under the Annual Rehabilitation Report and Forward Program. EnergyAustralia does not have any defined timeframes for additional rehabilitation beyond this three-year period.*
>
> *If a decision is made for closure at Pine Dale, then the Annual Rehabilitation Report and Forward Program would be updated and rehabilitation completed to meet the requirements of Plan 1 and 2 – Final Landform and Rehabilitation Plan (see Section 5 of this RMP).*
>
> *The RMP would also be updated if there is a change in the site status (i.e., recommencement or final closure activities are commenced).*

BCS recommend that that the RMP provide a detailed description of rehabilitation activities (see above recommendations) and provide an estimation of the schedule required to implement those activities from the date any decision is made for closure of the mine.

Recommendation

3.1 Provide an undated rehabilitation schedule detailing the estimated time to complete proposed rehabilitation activities. The trigger for this rehabilitation schedule may be the date any decision is made for closure of the mine.

4 Implement a robust quality assurance process

Following the adoption of clear, specific, measurable, and therefore auditable performance and completion criteria; BCS recommend that EnergyAustralia implement a robust quality assurance process.

A robust quality assurance process can consist of independent audits of performance against stated rehabilitation objectives, performance, and completion criteria by qualified auditors of environmental management systems.

Recommendation

4.1 Implement a robust quality assurance process including independent audits of performance against performance targets and completion criteria by qualified auditors of environmental management systems.

From: Lachlan Sims
To: Lulham, Jarvis
Cc: Eastwood, Ben; Paul Cashel; Lauren Stevens
Subject: RE: Pine Dale Rehabilitation Management Plan DRAFT
Date: Thursday, 2 June 2022 11:22:06 AM
Attachments: image002.jpg
image004.png
image006.png
image008.png
image010.png
image016.png
image017.png
image018.png
image019.png
image020.png
image021.png

Dear Jarvis,

Thank you for the opportunity to review and comment on the Draft Pine Dale Mine Rehabilitation Management Plan.

I can confirm that Lithgow City Council staff have reviewed the draft and raise no objections to the actions and rehabilitation measures proposed.

Please contact me if you require any further information.

Regards,

Lachlan Sims | Team Leader Development
Economic Development & Environment | Lithgow City Council
Phone: (02) 6354 9999 |

Lithgow City Council

From: Lulham, Jarvis
Sent: Friday, 13 May 2022 3:32 PM
To: Andrew Muir
Cc: Eastwood, Ben
Subject: Pine Dale Rehabilitation Management Plan DRAFT

Hi Andrew,

Please see attached a copy of the draft Pine Dale Mine Rehabilitation Management Plan (RMP) May 2022 for your review and comment.

EnergyAustralia owns and operates the Pine Dale Mine, which is currently in Care and Maintenance. The attached draft RMP has been prepared in accordance with the requirements under the amendments to the Mining Act which comes into effect in June 2022. The NSW Resources Regulator has recently released a new set of compliance and reporting requirements for rehabilitation (known

as the Rehab Reforms) through the development of a new regulation under the Mining Act 1992. The Mining Amendment (Standard Conditions of Mining Leases - Rehabilitation) Regulation 2021 set out the mandatory requirements under the new conditions. EA is required to consult with the Lithgow City Council prior to its submission to the Natural Resource Access Regulator.

Please provide your comments back to EA in regard to the attached RMP by **Friday 3rd of June 2022**.

Please contact me if you have any questions relating to the above.

Kind Regards,
Jarvis Lulham

Kind Regards,

Jarvis Lulham
Environment Graduate | Mt Piper Power Station
jarvis.lulham@energyaustralia.com.au t + 61 2 6354 8321

EnergyAustralia
350 Boulder Road, Portland, NSW 2847
energyaustralia.com.au

From:	Ben Harlor
To:	Lulham, Jarvis
Cc:	Girja Sharma
Subject:	RE: DRAFT Pine Dale Mine Rehabilitation Management Plan
Date:	Wednesday, 15 June 2022 2:22:38 PM
Attachments:	image003.png image005.png image011.png image014.png image016.png image020.png image008.png image013.png image015.png image018.png image021.png image022.png image023.png image024.png image025.png image026.png

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Hi Jarvis,

In response to EnergyAustralia's consultation regarding the Pine Dale Mine Rehabilitation Management Plan, please find WaterNSW response below.

WaterNSW appreciates being asked to provide comment on the Pine Dale Mine Rehabilitation Management Plan (RMP) 2022. Please ensure WaterNSW remain as a stakeholder for any further review, opportunity to provide comment and any other associated correspondence regarding this.

WaterNSW recommends adhering to the criteria and timeframes of the RMP, especially Table 9 - Rehabilitation and Quality Assurance Process – Pine Dale, and the measures and conditions identified in the Table 10 - Trigger Action Response Plan, and taking action when indicators show an emerging threat may impact achieving the rehabilitation outcomes required for the final land use.
WaterNSW encourages the continued maintenance of all erosion and sediment controls in place during the care and maintenance period and management of water at the site in accordance with the Rehabilitation Management Plan. In conjunction with existing monitoring and maintenance requirements, it is recommended that additional checks occur during and after significant rain events.

Kind Regards, Ben

Ben Harlor
Catchment Assessments Officer

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