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GRAYMONT

Rehabilitation Management Plan (RMP)

Sulcor Limestone Mine

Date

13 March 2024

Rev01

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Reviewed by — Don Cheong		**Date —** 13 March 2024
Graymont accepted by — Damian Power		**Date —** 13 March 2024

Revision History

Rev No.	Description	Prepared by	Reviewed by	Authorised by	Date
A	Draft report	AR & CG	AB	AB	02/08/2022
B	Draft report	AR & CG	AB	AB	05/08/2022
00	Final report	CG	AB	AB	08/08/2022
01	2024 Update	AB	DC	DP	13/03/2024

Summary table

Sulcor Limestone Mine – Rehabilitation Management Plan (RMP)	
Name of Mine	Sulcor Limestone Mine
Rehabilitation Management Plan Commencement Date	1 August 2022
Revision Date	13 March 2024
Version number	01
Mining Authorisations (Lease/Licence No.)	Mining Lease ML 1470
Name of lease holder(s)	Graymont (NSW) Pty Ltd
Name and Contact Details of the Mine Manager (or equivalent)	Damian Power Garthowen Road, Attunga NSW 2345 02 6761 1211
Name and Contact Details of Environmental Representative	Lizz Norvill Garthowen Road, Attunga, NSW, Australia, 2345 02 6761 1211

1. Introduction

1.1 History of operations

Mining activity around the Sulcor site began in the early 1920s. Operations included the quarrying and processing of limestone. Early operations were taken over by the Sulphide Corporation and continued until the 1950s.

Mining focused on the current pit area (Pit A) with the main high face developed in these earlier years. During the 1950s, the operations were taken over by the Newcastle Lime and Cement Company, which continued mining work until the early 1970s. Some further exploration was carried out in the 1970s by other parties.

Pit A was inactive until the late 1990s, when a Mining Lease Application (MLA 128) was lodged by David Mitchell (NSW) Pty Ltd. The application encompassed the area of the Sulcor quarry and approximately 2km north of the Sulcor Pit. David Mitchell also purchased the freehold property known as Shariona Park, which encompasses the Mining Lease area.

The Mining Lease was granted in August 2000 (ML 1470), and quarrying operations were recommenced in 2001. Limestone mining was carried out in the base of the old Sulcor Quarry. Operations focused on extracting stone from the quarry's floor to a level above the existing water table. Limestone was and is still transported to the Attunga Limestone Mine for processing.

UNIMIN Australia acquired David Mitchell (NSW) Pty Ltd in 2002. Unimin Australia Limited was renamed Sibelco Australia Limited as of 1 January 2011. In August 2019, Graymont (NSW) Pty Ltd acquired Sibelco Australia's lime operations, including the Sulcor site.

As per DA99/307 MOD 2018-0013, there is no defined period on the mine's life.

Rehabilitation history

Initial screening and tree establishment works were undertaken following the commencement of mining operations in 2001. This included work to stabilise existing fine soil stockpiles (referred to as the Southern Bund), establish vegetation screens at a number of locations, create corridor plantations and shape waste emplacements to ensure they are stable. Previous rehabilitation works are monitored to measure plant growth rates, erosion, and weed infestation.

1.2 Current development consents, leases and licences

The current development consent, leases, licences, and other approvals are shown in Table 1.

Table 1: Current consents, leases, and licences

Documentation, Condition or Licence	Approval Authority	Status
DA99/307 MOD 2018-0013	Tamworth Regional Council	Consent granted 29/3/2000 for 20 years. Consent modified 13/2/2018 for an indefinite period
Mining Lease Conditions of Authority	Dept. of Mineral Resources	ML 1470 granted 29/8/2000
Environmental Management Plans	Parry Shire Council – now Tamworth Regional Council.	Approved 22/11/2000
Environmental Protection Licence.	EPA	EPA Licence 11225 granted on 13/12/2000. Licence variation approved Variation No. 1524776 22/01/2015
Water Access Licence 20646	NSW Office of Water	Bore licence converted to Water Access Licence and Water Supply Work Approval
Water Supply Work Approval 90CA818924	NSW Office of Water	Bore licence 90BL246713 converted to Water Access Licence and Water Supply Work Approval
Monitoring Bore Licences	NSW Office of Water	Licences 90BL24992/0, 1 & 2 granted 24/10/2000, exempt under Water Management legislation
Excavation Permit	Heritage Council of NSW	Permit issued 16/8/2000

1.3 Land ownership and land use

The Mining Lease ML 1470 encloses a total of 188.5ha of land area, including the following Lots and DPs.

- Lot 1 / DP187233
- Lot 1, 2 / DP559907
- Lot 86-87 / DP 753834
- Lot 88 / DP 753834
- Lot 114-117 / DP 753834
- Lot 126 – 129 / DP 753834
- Lot 263, 264 / DP 753834
- Lot 268 / DP 753834
- Lot 310 / DP 753834
- Lot 1 / DP 312169
- Lot 10 / DP 7056592; and
- Lot A, B / DP 398256.

The property is wholly owned by Graymont and is surrounded by the Shariona Park Property.

Table 2 provides an overview of the land ownership and land use of the mining lease.

Table 2: Land ownership and land use

Lease	Landowner	Area (ha)	Historic land use	Current land use	Proposed final land use	Land Tenure	Expiry Date
ML 1470	Graymont	188.5	Agricultural Grazing and cropping	Mining and Overburden Emplacement	Agricultural Grazing	Freehold	28/8/2023

1.3.1 Land ownership and land use figure

Figure 1 describes the land ownership and land use in proximity to the mine site.

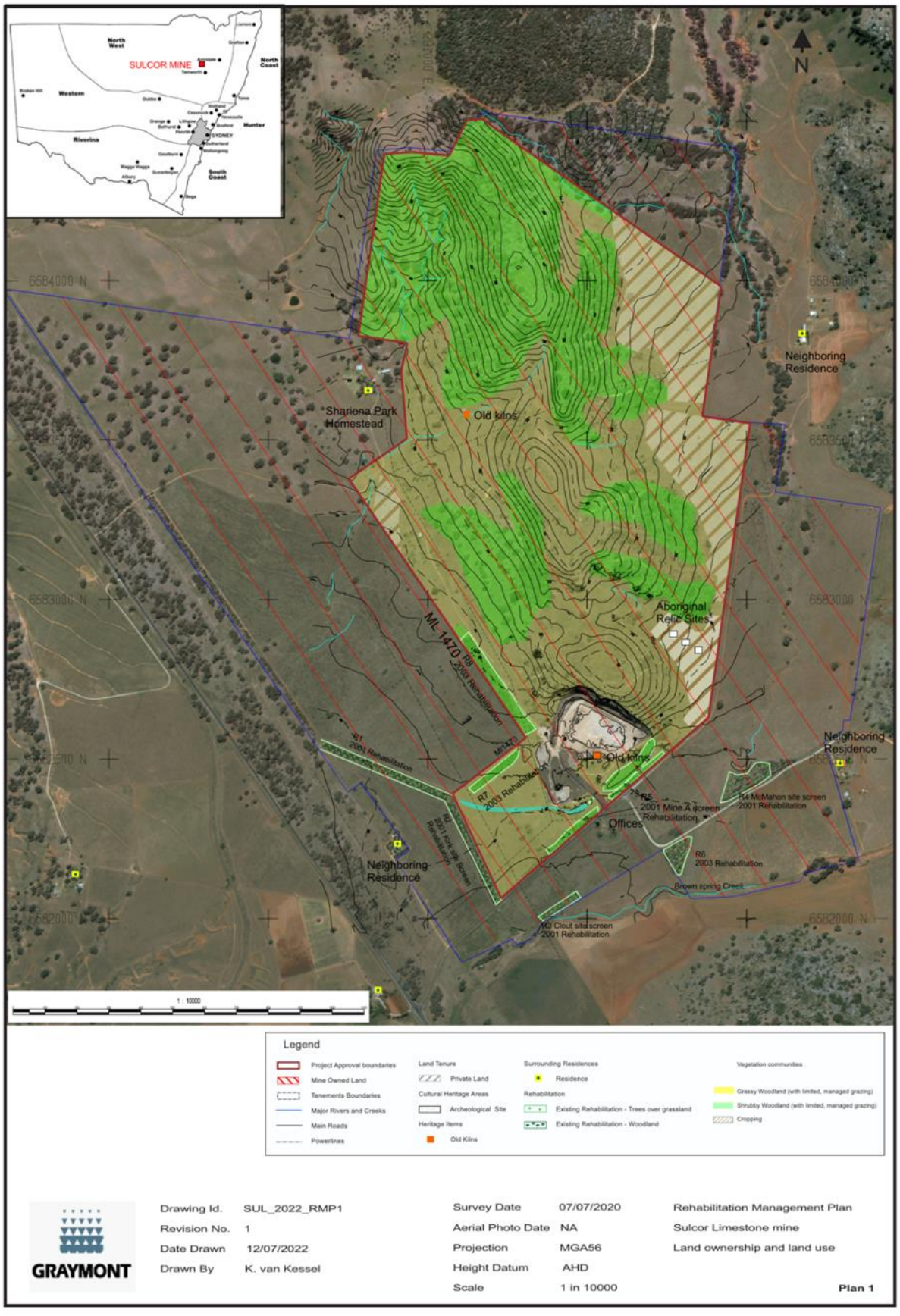

Figure 1: Land ownership and land use

2. Final land use

2.1 Regulatory requirements for rehabilitation

Table 3 outlines regulatory requirements contained in Conditions to Mining Lease ML1470 and conditions of development consent DA99/307 MOD 2018-0013.

Table 3: Regulatory requirements

Development Consent Condition No.	Conditions	Timing	Application	Addressed in RMP
3.5	Site Rehabilitation and Management 1. The Applicant shall carry out rehabilitation of all mine areas in accordance with the requirements of the MOP prepared under Condition No 2.1 and any Mining Lease granted by the Minister of Mineral Resources. 2. Rehabilitation plans shall be updated and adjusted according to management advances over the area of the mining lease. The rehabilitation plans shall be available to the Council for comment.	During and Post Mining	ML 1470	This document.

As of July 2022, the *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2021* introduced a standard set of rehabilitation conditions for all mining leases in NSW. These conditions are now located in Schedule 8A of the Mining Regulation 2016 and commenced on 2 July 2022 for large mines. The new conditions require progressive rehabilitation, rehabilitation risk assessment, annual reporting and detailed rehabilitation management planning, and apply to all of ML 1470.

A summary of the new rehabilitation conditions is provided in Table 4.

Table 4: Standard Rehabilitation Conditions for Mining Leases under Schedule 8A

Condition No.	Condition Title	Summary	How Addressed in RMP
1	Definitions	Defines words and terms used I the schedule	n/a
2	Functions of Secretary – approval of Rehabilitation Outcome Documents	Outlines functions of the Secretary in approving rehabilitation outcome documents and notifying the lease holder	n/a
3	Assessments and documents may relate to more than 1 Mining Lease	Outlines functions of the Secretary in treating multiple leases relating to a single mine as a single lease	n/a
4	Must prevent or minimise harm to the environment	Outlines obligations of the lease holder to prevent or minimise harm to the environment	This plan (as relates to rehabilitation)

Condition No.	Condition Title	Summary	How Addressed in RMP
5	Rehabilitation to occur as soon as reasonably practicable after disturbance	Outlines obligations of the lease holder to rehabilitate land and water as soon as reasonably practicable after disturbance occurs	This plan
6	Rehabilitation must achieve final land use	Outlines obligations of the lease holder to achieve the final land use	This plan
7	Rehabilitation Risk Assessment	Outlines obligations of the lease holder to document a Rehabilitation Risk Assessment	This plan
8	Application of division	Outlines the application of Division 3 in relation to rehabilitation documents	n/a
9	General requirements for documents	Outlines the application of Division 3 in relation to the form of rehabilitation documents	n/a
10	Rehabilitation Management Plans for large mines	Outlines obligations of the lease holder in relating to preparing and implementing a Rehabilitation Management Plan	This plan
11	Amendment of Rehabilitation Management Plans	Outlines obligations of the lease holder to amend a Rehabilitation Management Plan when directed	Chapter 11 of this RMP
12	Rehabilitation Outcome Documents	Outlines obligations of the lease holder to prepare Rehabilitation Outcome Documents including: • rehabilitation objectives statement • rehabilitation completion criteria statement; and • final landform and rehabilitation plan	This plan including related submissions
13	Forward Program and Annual Rehabilitation Report	Outlines obligations of the lease holder to prepare a Forward Program and Annual Rehabilitation Report	n/a
14	Amendment of Rehabilitation Outcome Documents and Forward Program	Outlines obligations of the lease holder as to when and how Rehabilitation Outcome Documents and Forward Program may be amended	n/a
15	Times at which documents must be prepared and given	Outlines timing required for preparation of various documents under Schedule 8A	n/a
16	Certain documents to be publicly available	Outlines obligations of the lease holder to make publicly available a Rehabilitation Management Plan, a Forward Program and an Annual Rehabilitation Report	n/a
17	Records demonstrating compliance	Outlines obligations of the lease holder to create and maintain records that demonstrate compliance with Schedule 8A	n/a

Condition No.	Condition Title	Summary	How Addressed in RMP
18	Report on non-compliance	Outlines obligations of the lease holder to report on a non-compliance with the mining lease or of the Act or Regulation	n/a
19	Nominated contact person	Outlines obligations of the lease holder to nominate a contact person with who the Secretary can communicate in relation to the mining lease	n/a
20	Additional requirements – application for or to modify development consent	Outlines obligations of the lease holder in relation to a modification of or application for development consent	n/a

2.2 Final land use options assessment

The final land use was defined on the development consent DA 99/307 and described in the Environmental Impact Statement (1999). The rehabilitation and final land use objective is to leave the site in a safe condition, with disturbed ground to be returned to rough grazing and voids left open as water storage. No further options assessment has been undertaken.

2.3 Final land use statement

The final land use is native ecosystem across most areas disturbed by mining, with limited light grazing and residual voids for the active mining areas. This land use is compatible with the surrounding land use which includes livestock production and cropping. Enhancing the development of grassy woodland native vegetation communities consistent with the surrounding area will improve habitat for native fauna and overall biodiversity values.

2.4 Final land use and mining domains

2.4.1 Final land use domains

The principal objective for the rehabilitation of Sulcor Limestone Mine is to return the site to a condition where its landform, soils, hydrology, flora and fauna are self-sustaining and compatible with the surrounding land use. The final land use domains are listed and defined in Table 5.

Table 5: Final land use domains

Final land use domain	Spatial Reference Code	Sulcor Limestone Mine
Native ecosystem	A	The majority of the site is to be restored to native vegetation with low intensity grazing in suitable areas. Revegetation is to be consistent with the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area.
Final Void	J	The mine voids will be retained and stabilised with 12m high benches and 10m wide berms. A safety bund and fence will be established around the perimeter of the pits to prevent unauthorised entry. Pit A would be partially backfilled with overburden

	from Pit B and would retain an open water storage area. A Final Landform Feature of agricultural grazing is included in Pit A. Pit B would not be backfilled.

The Environmental Impact Assessment (EIS) (Gordon Atkinson & Associates, 1999) stated the rehabilitation objective is to leave the site in a safe condition, with disturbed ground to be returned to rough grazing and voids left open as water storage. The MOP indicates a final land use as a combination of stock grazing, pasture and wildlife habitats.

Though light on detail, the EIS and subsequent approvals documents make reference to other final land uses which are captured as final landform features (FLFs) within the Final Land Use plan:

- Access tracks. Some unsealed access tracks would be retained to ensure ongoing access for maintenance and to support the final land use including providing access to water retained in the pits.
- Bund around open pit. Minimum 1m high bund or barrier. Areas adjacent the bund to be sown with native grass, shrub and tree species.
- Open Cut Mines. Retained as open voids which will progressively fill with water. Additional features include:
    - Pit A is to be partially backfilled with overburden from Pit B. The overburden would be rehabilitated to agricultural grazing (Land and Soil Capability Class 7)
    - Pit A contains an open water body (stock dam)

2.4.2 Mining domains

Table 6 provides information regarding the current mining domains at Sulcor site.

Table 6: Mining domains

Mining domain	Spatial Reference Code	Sulcor Limestone Mine
Infrastructure area	1	This mining domain currently contains access roads within the site.
Water Management Area	3	There are currently two water management areas. WMA1 wraps around a small part of the southern end of the overburden area, closest to Sulcor Rd. WMA2 sits just above WMA1.
Overburden/Waste Emplacement Area	4	There are overburden sites southwest of Pit A (the current pit). At the time of writing, only OEA1, OEA2 and OEA3 exist, as these were the overburden sites used in previous mining. Additional overburden emplacement areas will be allocated to the southwest of the pit, and an overburden emplacement area will be constructed northwest of Pit A. Pit A will also be backfilled with overburden from Pit B.
Active Mining (Open Pit Void)	5	Open pit mining utilises conventional drill & blast and load & haul techniques to extract limestone. Blasted limestone is either crushed at site using an in-pit mobile crusher or loaded at the mine face directly into trucks and despatched to Attunga for crushing and screening.

3. Rehabilitation risk assessment

The Sulcor Limestone Mine has undertaken a rehabilitation risk assessment and identified appropriate controls for potential risks during each mining rehabilitation phase, as listed below.

- Active mining and production
- Decommissioning
- Landform Establishment
- Growth medium development
- Ecosystem establishment; and
- Ecosystem and land use development.

The risk rating was developed in accordance with the likelihood criteria (Table 7), consequence table (Table 8) and risk matrix (Table 9). The method and findings of the risk assessment process is presented as a risk register in Table 10.

Date of last review of rehabilitation risk assessment: 8/8/2022.

Table 7: Likelihood criteria

Level	Rating	Description **This is a subjective judgement based on our knowledge and experience.**	Frequency
5	Almost Certain	The event is expected to occur in most circumstances	More than once a year
4	Likely	The event will probably occur in most circumstances	At least once per year
3	Possible	The event is plausible to occur in some circumstances	At least once in 3 years
2	Unlikely	The event could occur in few circumstances	At least once in 10 years
1	Rare	The event may only occur in exceptional circumstances	Less than once in 15 years

Table 8: Consequence table

	Rehabilitation, Environment and Community	Health and Safety	Financial
Catastrophic (5)	• Permanent impacts to populations of rare or threatened flora or fauna • Adverse impacts (i.e., damage, destruction, or removal) to state or nationally listed indigenous or non-indigenous heritage item • Complete removal of habitat of threatened species • Significant impairment of ecosystem function • Multiple negative media reports; or • Legal action initiated by members of the community.	• One or more fatalities.	• >$1M business impact.
Major (4)	• Removal, destruction, or loss of whole populations of common native flora and/or fauna • Adverse impacts to non-listed or locally significant indigenous or non-indigenous heritage items; or • Negative media report or multiple community complaints.	• Injury or illness that requires hospitalisation and/or results in permanent impairment.	• $100k-$1M business impact.
Moderate (3)	• Loss of individual member of rare or threatened species • Extensive impacts on soil, air or water that requires coordinate clean-up • Offsite discharges/emissions outside of advised levels (e.g., licence limit, or environmental advisor / consultant advice); or • Individual community complaint.	• Injury or illness more severe than a sprain, strain or superficial wound that requires medical treatment and/or a temporary work restriction (e.g., breaks, fractures, lacerations, burns, torn ligaments).	• $10-$100k business impact.
Minor (2)	• Contamination of any on-site water body or impacts on soil and air quality beyond immediate work area but contained onsite; or • Loss of individuals of common (not threatened) native flora or fauna.	• Sprain, strain, or superficial wound (i.e., bruise, cut, abrasion) that requires medical treatment and/or a temporary work restriction.	• $1k-$10k business impact.
Insignificant (1)	• Direct impacts on soil or air within immediate work area and immediately cleaned up with no residual contamination.	• Injury or illness that requires no more than first aid treatment and no work restriction.	• <$1k business impact.

Table 9: Risk matrix

	CONSEQUENCE						
LIKELIHOOD			CATASTROPHIC	MAJOR	MODERATE	MINOR	INSIGNIFICANT
			5	4	3	2	1
	ALMOST CERTAIN	5	25 High	23 High	20 High	16 Medium	11 Medium
	LIKELY	4	24 High	21 High	17 Medium	12 Medium	7 Low
	POSSIBLE	3	22 High	18 Medium	13 Medium	8 Low	4 Low
	UNLIKELY	2	19 Medium	14 Medium	9 Low	5 Low	2 Low
	RARE	1	15 Medium	10 Low	6 Low	3 Low	1 Low

Table 10: Rehabilitation risk assessment

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
			Likelihood	Consequence	Risk Rating		Likelihood	Consequence	Risk Rating	
1. General										
1.1	Rehabilitation skills	Insufficient skills and experience of rehabilitation personnel affects achievement of closure criteria and final land use goals.	4	3	18	• Ensure relevant site personnel are appropriately trained in rehabilitation planning, design, and review; and • Seek specialist advice when designing and implementing rehabilitation plan.	2	2	5	• Engage experienced staff or contractors to review rehabilitation outcomes, revise plans and develop actions for restoration as required; and • Initiate additional and targeted rehabilitation supervision, monitoring, and reporting.
1.2	Rehabilitation responsibilities	Lack of clearly defined responsibilities leads to poor planning and implementation of rehabilitation activities.	3	2	8	• Define rehabilitation responsibilities in personnel role descriptions and in operational and rehabilitation management plans; and • Assign rehabilitation responsibilities to personnel with the required knowledge, experience, capability, and capacity to ensure successful implementation.	2	2	5	• Review personnel responsibilities and rehabilitation plans; and • Initiate additional and targeted rehabilitation supervision, monitoring, and reporting.
1.3	Rehabilitation funding	Insufficient funding for or prioritisation of rehabilitation leads to poor planning and implementation of rehabilitation activities.	2	3	9	• Rehabilitation targets to be reviewed annually and reported in AEMRs. • Set rehabilitation budgets and targets annually; and • Rehabilitation KPIs to be part of management discussions and success reported annually.	1	3	6	• Escalate financial constraints to senior management.
1.4	Rehabilitation success	Rehabilitation monitoring is poorly planned or implemented, leading to poor performance and delays to necessary intervention.	3	3	13	• Implement annual rehabilitation surveys as part of an integrated rehabilitation monitoring program. Monitoring program to: ○ Compare results against rehabilitation objectives and targets ○ Identify possible trends and continuous improvement ○ Link to records of rehabilitation to determine causes and explain results ○ Assess effectiveness of environmental controls implemented ○ Where required, identify modifications required for the monitoring and rehabilitation program ○ Identify practices or areas requiring research ○ Compare flora species present against original seed mix and/or reference sites ○ Assess vegetation health; and ○ Assess vegetation structure (e.g., upper, mid, and lower storey).	2	3	9	• Initiate additional and targeted rehabilitation supervision, monitoring, and reporting; and • Seek specialist advice and implement targeted rehabilitation response to address the threat.
2. Mining / Production										

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
2.1	Site contamination	Contamination resulting from mining activities impacts the ability to achieve successful rehabilitation and a safe final land use.	3	2	9	• Store hazardous materials in covered and bunded containers, in accordance with relevant Australian Standards • Inspect storage areas and assess integrity, as part of weekly environmental inspections • Clean-up spills promptly and dispose of contaminated materials. Undertake follow up validation of clean-up of affected areas, as required • Undertake regular water monitoring to assess contamination risks; and • Take action to control the contaminant source and remediate affected waters ahead of rehabilitation works.	2	2	5	• Undertake targeted contamination assessment to characterise risks and develop appropriate remedial actions; and • Implement remedial action plan.
2.2	Geotechnical and chemical constraints	Adverse geochemical/chemical composition of materials such as overburden/interburden, processing wastes, subsoils and topsoils and imported cover materials leading to pollution or poor growing conditions, and poor rehabilitation outcomes.	3	3	13	• Test materials against relevant acceptance criteria before incorporating into final landform or blending with growth media • Obtain specialist advice from soil scientist, agronomist or similar; and • Ameliorate materials to overcome physical or chemical constraints.	2	3	9	• Obtain specialist advice and develop appropriate remedial actions which could include removal or amelioration of unsuitable materials.
2.3	Landform development	Mining landform results in complex or unsafe conditions that are inconsistent with final landform goals	3	3	13	• Ensure final landform goals are factored into development and implementation of mine plans; and • Incorporate staged rehabilitation into mine planning.	2	3	9	• Obtain specialist advice and review final landform goals. Amend rehabilitation and closure plans as required.
2.5	Waste Storage Materials	Loss of materials and sediment through runoff and erosion	4	3	17	• Ongoing monitoring, inspection and maintenance of dams and containment structures • Installation of water flow measures such as bunds to control flow events; and • Vegetation for long term stability.	2	3	9	• Obtain specialist advice and review final landform goals. Amend rehabilitation and closure plans as required.
3. Decommissioning										
3.1	Contamination from waste materials	Contamination resulting from residual wastes and associated activities (e.g., removal of fuel and chemical storage containers, underground fuel tanks, removal of asbestos materials) leading to pollution or poor growing conditions, and poor rehabilitation outcomes.	3	2	8	• Incorporate appropriate procedures for removal of hazardous materials including final verification. • Employ suitably qualified demolition contractors • When removing fuel storage ensure tank and bund is emptied prior to removal; and • Appropriately remove scrap steel and ensure that any contaminated soil is removed and disposed of in an appropriate manner.	2	2	5	• Undertake validation sampling and analysis of any residual contamination risks and develop appropriate remedial actions; and • Implement remedial action plan.

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
3.2	Waste material removal	Inadequate clean-up and removal of building and infrastructure materials generates residual wastes, causing ability to achieve closure criteria.	4	2	12	• Conduct final inspection of decommissioning and clean-up with Hold Points and release criteria for demolition contractors; and • Incorporate appropriate hold points and performance criteria and demolition and waste removal contracts.	3	2	8	• Obtain specialist advice and develop appropriate remedial actions which could include removal or amelioration of unsuitable materials.
3.3	Waste storage	Adverse geotechnical and or geochemical issues associated with process waste storage facilities (e.g. tailings, reject emplacements, overburden and waste rock dumps etc) leading to pollution or poor growing conditions, and poor rehabilitation outcomes.	3	3	13	• Seek specialist geotechnical assessment as part of final landform design; and • Design and construct suitable emplacements for geochemically hazardous materials.	2	3	9	• Obtain specialist advice and develop appropriate remedial actions which could include removal or amelioration of unsuitable materials.
3.4	Demolition and decommissioning of buildings and infrastructure	Inadequate planning and funding of decommissioning activities leads to delays or compromised final landform outcomes.	3	3	13	• Prepare a demolition plan that ensures achievement of the final landform and rehabilitation goals; and • Rehabilitation plans to clearly identify any infrastructure to be retained including for example, services, concrete slabs, roads and water management infrastructure.	2	3	9	• Obtain specialist advice and develop remedial action plan to address any decommissioning failures and update rehabilitation and closure plans as required.
4. Landform Establishment										
4.1	Rehabilitation resources	Use of inappropriate rehabilitation machinery and equipment, compromises ability to achieve rehabilitation outcomes or desired final landform.	3	3	13	• Final landform including roads to be designed by suitably qualified personnel • Hire specialised plant and contractors to undertake major bulk earthworks; and • Supervise rehabilitation activities and intervene promptly if damage or poor performance is occurring.	2	3	9	• Assess damage, develop and implement remedial actions that could include actions like scarification to soil surfaces, respreading topsoil and resowing seed.,
4.2	Landform stability	Instability of highwalls and benches compromises ability to achieve the desired final landform.	3	4	18	• Seek specialist geotechnical advice for final landform design, to specifically advise on measures such as bench and batter widths, heights and highwall stability and protection; and • Consider measures such as scaling or rock bolting to improve long term stability	2	3	9	• Implement repairs as necessary; and • Obtain specialist advice and review final landform goals. Amend rehabilitation and closure plans as required
4.3	Landform stability	Final landform instability (e.g., Steep slopes, long slopes, erosion etc.) affecting revegetation and final land use capability.	3	4	18	• Undertake survey of final landforms prior to the placement of subsoil and topsoil, to verify establishment of desired grades and levels; and • Seek specialist advice for advice on aspects such as batter grades, drainage measures, slope lengths and slope curvature, and placement of mid-slope berms and drains.	2	3	9	• Implement repairs as necessary; and • Obtain specialist advice and review final landform goals. Amend rehabilitation and closure plans as required.

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
4.4	Landform suitability	Final landform unsuitable for intended land use (e.g., Slopes too steep for grazing, large rocks present affecting cultivation, settlement and surface subsidence leading to extended ponding etc.).	3	4	18	• Seek specialist advice and undertake agricultural land capability assessment. Agronomist to advise on aspects of landform development where a final land use of light grazing is sought; and • Quality control of landform preparation to ensure appropriate surface preparation, achievement of desired grades and drainage control.	2	3	9	• Implement repairs as necessary; and • Obtain specialist advice and review final landform goals. Amend rehabilitation and closure plans as required.
4.5	Landform suitability	Landform aspect not properly considered when selecting target plant species, leading to poor rehabilitation outcomes.	4	3	17	• Aspect to be factored into revegetation design (e.g. use more drought tolerant species on exposed north facing slopes). Specialist advice to be sought when preparing revegetation plans.	3	2	8	• Seek specialist advice and revise revegetation program; and • Implement remedial actions such as resowing and implementing a watering program.
4.6	Water availability	Water availability inadequate for landform preparation	3	3	13	• If water supply is inadequate for proper landform preparation during earthworks, consider either suspending the action or ordering in supplemental water; and • Design the final landform with passive drainage as far as practicable and incorporate elements to encourage moisture infiltration and reduce runoff.	2	3	9	• Employ specialist contractor to undertake repairs ensuring; and • Obtain supplemental water to utilise during earthworks and landscape forming.
4.7	Dams and drains	Dams or major water conveyance structures inadequately designed or constructed for long term stability	3	4	18	• Final landform to be designed by suitably qualified personnel • Use experienced civil contractors and supervise works during major earthworks or drainage projects • Review of dam safety and integrity to be undertaken as part of final landform geotechnical assessment; and • Construction of major water storages or drains to be supervised and certified by suitably qualified personnel on completion.	2	3	9	• Seek specialist civil/geotechnical advice; and • Remedial measures to be implemented where dam or drain integrity is at risk. May involve repairs or complete rebuild.
4.8	Access roads	Poor design or construction of retained access roads (including road drainage) causing ongoing erosion or instability issues	3	3	13	• Final landform including roads to be designed by suitably qualified personnel; and • Use experienced civil contractors and supervise works during major earthworks or drainage projects	2	3	9	• Review stormwater drainage and assess need for new controls such as earth bunds and cross banks • Install new controls to manage surface water flows • Reconstruct damaged roads; and • Rehabilitate and revegetate disused tracks to stabilise soil surface and minimise the need for ongoing maintenance.
5. Growth Medium Development										

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
5.1	Soil resources	Poor knowledge and record keeping of subsoil and topsoil resources affects quality or availability of soil materials for rehabilitation.	3	3	13	• Audit and maintain up to date records of material type (topsoil and subsoil) quantity, quality and locations • Analyse stored topsoil prior to use to establish quality and amelioration requirements. A suitable guide to topsoil quality assessment would be used, e.g. *Guide for Selection of Topdressing Material* (Elliot & Veness, 1981). Test topsoil and subsoil materials • Assess availability of growth media against rehabilitation requirements and develop plans to address deficiencies; and • Conduct trials of blending processing wastes, overburden and other materials to produce desirable growing media. Testing to evaluate material physical and chemical properties. Specialist advice should be sought (e.g. agronomist or soil scientist).	2	3	9	• Seek specialist advice on growth media development where site resources are inadequate or perform poorly • Work with local suppliers to obtain and import topsoil to address any deficit; and • Ensure imported soil is of suitable quality, weed free and managed and spread to achieve rehabilitation goals.
5.2	Soil resources	Inadequate topsoil quality and volume available to achieve the desired final landform and rehabilitation plans	4	3	17	• Store topsoil appropriately to maintain optimum physical and chemical qualities, e.g. stockpile heights to be kept <3m high where practicable • Seed and fertilise stockpiles with an annual cover crop or with desirable native species, to help minimise weed infestation and improve organic matter • If practicable, revegetate topsoil stockpiles with native grasses to generate a seed bank of desirable species • When planning rehabilitation works, use the highest value growth media materials (i.e. topsoils) in situations where they will achieve maximum effect; and • Minimise wastage of high-quality growing media, e.g. avoid use of topsoils in situations where lower quality materials would suffice, such as in creation of bunds.	3	3	13	• Seek specialist advice on growth media development where site resources are inadequate or perform poorly • Work with local suppliers to obtain and import topsoil to address any deficit; and • Ensure imported soil is of suitable quality, weed free and managed and spread to achieve rehabilitation goals.
5.3	Soil resources	Substrate inadequate to support achievement of native revegetation or agricultural land capability (e.g. inadequate soil depth, adverse soil chemical or physical properties, lack of organic matter, nutrient deficiency, lack of soil biota, and any other factors impeding the effective	4	3	17	• Seek specialist advice when designing rehabilitation plans • Ameliorate subsoil and topsoil materials as determined necessary by material testing; and • Undertake revegetation trials to assess adequacy of growth media prior to larger scale establishment of growth medium across rehabilitation areas.	3	3	13	• Supplement onsite materials with imported topsoil, fertiliser and compost/mulch to improve soil fertility, soil biota and to make up deficit in topsoil volumes.

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
		rooting depth, fertility or moisture holding capacity).								
6. Ecosystem Establishment										
6.1	Seed quality	Poor seed viability, seed dormancy or poor germination, reduce revegetation success.	3	3	13	• Conduct germination testing and review of seed spreading and topsoil preparation techniques; and • Monitor revegetation performance.	2	3	9	• Review and adjust seeding rate or species type; and • Source alternate seed supply or increase seeding rate to account for lower germination rates.
6.2	Seed predation	Ant, insect or bird predation of seed reduce revegetation success.	2	2	5		2	2	5	• Increase seeding rates and re-sow as necessary if seed predation is an issue.
6.3	Fertiliser	Damage to seed by mixing with fertilisers reduce revegetation success.	2	2	5	• Follow supplier's recommendations; and • Avoid over-fertilising soils where native plants are being established.	1	2	3	• Re-sow as necessary in response to poor germination.
6.4	Destructive weather events	Destructive weather and climatic events (e.g., Drought; intense rainfall events; flood; bushfire etc.) causes damage to landform, soils, or ecology of rehabilitation areas.	4	3	17	• Incorporate preventative measures (eg fire breaks, good drainage) into landform design • Incorporate water storage into final landform design to assist resilience to drought and provide water for irrigation during vegetation establishment • Review weather forecasts regularly and adapt revegetation planning accordingly • Suspend revegetation work during extreme drought conditions if alternate water supply cannot be obtained; and • Plan for provision of supplementary water for irrigation always as part of revegetation planning.	3	3	13	• Obtain specialist advice and prepare remediation plan to address significant damage to ecology or landforms bought about due to climatic extremes; and • Implement remedial repairs.
6.5	Rehabilitation resources	Use of inappropriate rehabilitation machinery and equipment compromises ability to achieve rehabilitation outcomes or desired final landform.	3	3	13	• Hire specialised plant and contractors to undertake key rehabilitation tasks, such as seed spreaders, hydromulchers • Final landform including roads to be designed by suitably qualified personnel; and • Supervise rehabilitation activities and intervene promptly if damage or poor performance is occurring.	2	3	9	• Assess damage, develop and implement remedial actions that could include actions like scarification to soil surfaces, respreading topsoil and resowing seed.
6.6	Rehabilitation resources	Lack of resources for rehabilitation maintenance leading to failure to achieve rehabilitation and closure criteria.	4	3	17	• Rehabilitation inspection and maintenance to be an integral part of the site's operational management and monitoring system • Undertake formal annual rehabilitation surveys; and • Undertake regular inspections of rehabilitation areas (for example, as part of a weekly environmental inspection) to promptly identify risks	2	3	9	• Engage specialist contractors in rehabilitation and maintenance

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
						and also success factors. Incorporate feedback into future rehabilitation planning.				
6.7	Weeds	Weed infestation associated with both introduction and control (or lack thereof) within rehabilitation areas compromises rehabilitation targets and closure criteria.	4	3	17	• Visually screen rehabilitation seed mix to confirm free of weed seed • Obtain only high-quality compost, mulches or manures that are certified weed free • Undertake weed inspection and control program (at least annually) as part of the Weed Management Plan and routine rehabilitation monitoring; and • Avoid use of topsoil material from stockpiles infested with weeds.	2	3	9	• Implement targeted weed eradication program employing specialist contractors.
6.8	Revegetation stresses	Damage or overgrazing from fauna (e.g. kangaroos, feral goats, etc.) and livestock reducing vegetation establishment, reducing stability and causing erosion.	3	3	13	• Install exclusion fencing; and • Implement feral animal controls in consultation with relevant authorities.	2	3	9	• Implement feral animal controls in consultation with relevant authorities; and • Undertake revegetation repairs.
6.9	Infrastructure	Lack of infrastructure to support intended final land use (e.g. Dams, fences, watering facilities etc.).	3	3	13	• Assess infrastructure needs and incorporate details within the rehabilitation plans; and • Ensure infrastructure needs are accounted for in calculation of rehabilitation bonds.	2	3	9	• Review infrastructure needs as part of long-term monitoring and install new infrastructure as required.
6.10	Revegetation species	Inappropriate revegetation species mix for targeted final land use.	3	3	13	• Specialist advice to be sought when preparing revegetation mix. Advice to include consideration of desired final land use, slope/aspect, climatic, soil and other conditions.	2	3	9	• Obtain specialist advice to review the revegetation program and provide advice for revision as necessary; and • Implement remedial planting program.
6.11	Revegetation stresses	Insects and plant disease cause damage to the ecology of revegetation areas.	3	2	8	• Undertake pest inspection as part of routine monitoring.	2	2	5	• Seek specialist advice and implement recommended actions (e.g., pesticide control).
6.12	Revegetation goals	Lack of progress towards achievement of revegetation closure criteria (eg integration of native ecosystems with agricultural ecosystems as desired; poor development of target species and species diversity; limited structural development).	3	3	13	• Utilise annual rehabilitation surveys to assess progress towards completion criteria. • Where revegetation progress is deemed inadequate, use specialist advise to investigate the failing to understand the likely causes and develop remedial actions to address deficiencies.	2	3	9	• Seek specialist advice. Ensure that learnings are factored into future rehabilitation planning, processes, and monitoring.
6.13	Geotechnical risks	Geotechnical instability of rehabilitated landforms, e.g., slumping or cracking compromises ability to	3	4	18	• Assess stability of landforms as part of routine rehabilitation monitoring; and	2	3	9	• Undertake geotechnical investigation and seek specialist advice for repair of major deformation; and

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
		achieve the desired final landform				• Record details of any structural defects such as depth and extent of cracking.				• Repair landforms where deformation is observed to be persistent or worsening, and initiate revegetation.
6.14	Erosion and sedimentation	Erosion and loss of topsoil and subsoil compromises revegetation success and achievement of final land use goals	3	3	13	• Assess erosion and sedimentation status as part of routine rehabilitation monitoring. Factors to record include erosion extent, type (sheet, rill, gully) and severity • Review drainage and initiate new drainage works as required to control water flow around or across rehabilitated landscapes • Review bank and waterway grades if scouring is occurring. Consider remedial options such as reducing grades or physically armouring waterway channels • Replace eroded topsoil, re-scarify and revegetate eroded areas; and • Consider application of spray on soil stabiliser, hydromulch etc for quick effective cover solution, particularly in high erosion hazard areas (e.g., waterways, steep slopes and batters).	2	3	9	• Observe eroded areas during rainfall to monitor stormwater drainage and identify root cause • Review causes of erosion and implement targeted remedial measures that address the root cause • Seek specialist advice to address major erosion issues such as failing waterways, dam spillways or batter drop structures • Promptly repair and reshape eroded areas to prevent acceleration and progression of the erosion problem; and • Feed back learnings from erosion repairs into future landform and drainage design.
6.15	Dam and drainage failure	Failure of drainage and water management/storage structures, causing significant loss of sediment, damage to infrastructure and landforms.	3	3	13	• Inspect water storages regularly for any signs of compromised integrity, such as tunneling or tension cracking of dam embankments.	2	3	9	• Seek specialist advice where integrity of major waterways or storage structures is compromised and implement remedial measures promptly.
7. Ecosystem and Land Use Development										
7.1	Destructive weather events	Weather and climatic influences (e.g., drought; intense rainfall events; bushfire etc.) causes damage to landform, soils or ecology of rehabilitation areas.	4	3	17	• Incorporate drought tolerant species in the Revegetation plan • Develop the landform design to assist climate resilience (e.g., encouraging moisture infiltration) • Develop growth media to maximise moisture retention (e.g., by utilising clayey materials in subsoil development); and • Consider incorporation of micro-relief and microhabitat development in landscape design.	3	3	13	• Obtain specialist advice and prepare remediation plan to address significant damage to ecology or landforms bought about due to climatic extremes; and • Implement remedial repairs.
7.2	Vandalism and unauthorised access	Vandalism causes damage to the landform, soils or ecology of revegetation areas.	3	3	13	• Maintain security measures and include routine site security monitoring.	2	3	9	• Review security measures and implement additional controls as necessary; and • Repair any damage.

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
7.3	Vandalism and unauthorised access	Inadvertent or unauthorised access by mining equipment and vehicles causes damage to the landform, soils or ecology of revegetation areas.	3	3	13	• Maintain security measures and include routine site security monitoring.	2	3	9	• Review security measures and implement additional controls as necessary; and • Repair any damage.
7.4	Water quality	Post-closure water quality is unsuited to the final land use or causes ongoing pollution (e.g.acid-drainage, high salinity, high suspended solids etc.).	3	3	13	• Monitor water quality to address any risks identified during mining or landform development; and • Implement additional controls as necessary, such as sediment traps or other source controls.	2	3	9	• Seek specialist advice and implement remedial measures that may include new water treatment measures or removal of contaminant source.
7.5	Revegetation stresses	Insects and plant disease cause damage to the ecology of revegetation areas.	3	2	8	• Monitor vegetation success and plant health to allow quick identification of pest issues.	2	2	5	• Seek specialist advice and implement pest eradication program
7.6	Revegetation stresses	Overgrazing of pasture rehabilitation areas by livestock and wildlife damages revegetation areas, reducing vegetation establishment, reducing stability and causing erosion.	3	3	13	• Prevent grazing as far as possible until completion criteria achieved in lands destined for grazing. Exclude stock permanently from native ecosystem areas • Control feral animals to prevent overgrazing; and • Employ fencing or alternative to prevent stock and feral animal access.	2	3	9	• Implement feral animal controls in consultation with relevant authorities • Review efficacy of fencing and implement repairs or install new fencing as required; and • Undertake revegetation repairs.
7.7	Rehabilitation resources	Lack of resources for rehabilitation maintenance leading to failure to achieve rehabilitation and closure criteria.	3	4	18	• Maintain an adequate bond for long term maintenance and regularly review the bond; and • Ensure ecosystem development is sufficiently progressed towards final goals before closure criteria are signed off, to minimise need for post-closure maintenance.	2	3	9	• Escalate major rehabilitation and closure risks to senior management and seek additional funding if necessary for targeted maintenance and remedial programs.
7.8	Rehabilitation damage	Re-disturbance of established rehabilitation areas results in failure to achieve rehabilitation and closure criteria.	3	3	13	• Prevent unauthorised access; and • Routinely monitor rehabilitation areas to identify and repair any unwanted disturbance.	2	3	9	• Review efficacy of fencing, security measures and staff training, to ensure rehabilitation goals are widely understood and observed; and • Implement repairs or install new fencing as required.
7.9	Fauna mortality	Fauna entrapment and mortality in dams, final void etc due to unsafe landforms.	3	3	13	• Develop a water management plan in conjunction with a decommissioning procedure that details measures like safety and access prevention • Provide fencing around the perimeter of the mine pit and any dangerous water storages to prevent fauna access; and	2	3	9	• In the event of fauna mortality or unsafe conditions, review efficacy of fencing and other security measures and implement remedial actions.

Risk ID	Risk Issue	Description of Risk and Trigger	Risk Rating (pre-Control)			Preventative Controls	Residual Risk			Response actions to be considered if the risk eventuates
						• Design the final landform and water bodies to enable self-rescue of fauna (eg shallow gradient ramps for access).				
7.10	Public and stock safety	Unauthorised access past security fence due to poor design or damage of exclusion measures, results in safety risks to people and fauna such as fall from height hazards, unstable slopes and deep water	3	3	13	• Rehabilitation plan will provide for fencing to be installed around the perimeter of the mine pit to prevent uncontrolled access to this area • Install locked entry gate at site access • Install signage warning of dangers and to deter unauthorised entry; and • Address public and stock safety as part of final landform design and include necessary safety elements such as bench bunds above unsafe edges and fencing.	2	3	9	• In the event of fauna mortality or unsafe conditions, review efficacy of fencing and other security measures and implement remedial actions.

4. Rehabilitation objectives and rehabilitation completion criteria

4.1 Rehabilitation objectives and rehabilitation completion criteria

The Environmental Impact Assessment (EIS) (Gordon Atkinson & Associates, 1999) prepared for the DA 99/307 stated the rehabilitation objective is to leave the site in a safe condition, with disturbed ground to be returned to rough grazing and voids left open as water storage. The MOP clarified this objective indicating the majority of the Mining Lease area is to be returned to a state suitable for a combination of stock grazing, pasture and wildlife habitats. Cropping in some sections of the property may form part of a final land use.

These general objectives have been used to develop proposed rehabilitation objectives, indicators and completion criteria for each mining domain and final land use domain, that are presented in Appendix A. In due course, completion criteria will be further refined during preparation of a detailed decommissioning procedure.

The rehabilitation objectives statement was approved by the Secretary on 12 December 2023 (Reference: ROBJ0001366).

4.2 Rehabilitation objectives and rehabilitation completion criteria – stakeholder consultation

A consultation process was undertaken during the preparation of the EIS. Consultation did not raise specific issues related to rehabilitation and final land use.

5. Final landform and rehabilitation plan

5.1 Final landform and rehabilitation plan – electronic copy

The Final Landform and Rehabilitation Plan was approved by the Secretary on 12 December 2023 (reference FLRP0001261). Figures Figure 2 to Figure 5 provide copies of the approved final landform and rehabilitation plans submitted to the mine rehabilitation portal. Specifically, these Figures depict:

- Final Land Use (Figure 2)
- Final Landform Features (Figure 3)
- Current Authorisations (Figure 4)
- Final Landform Contours (Figure 5).

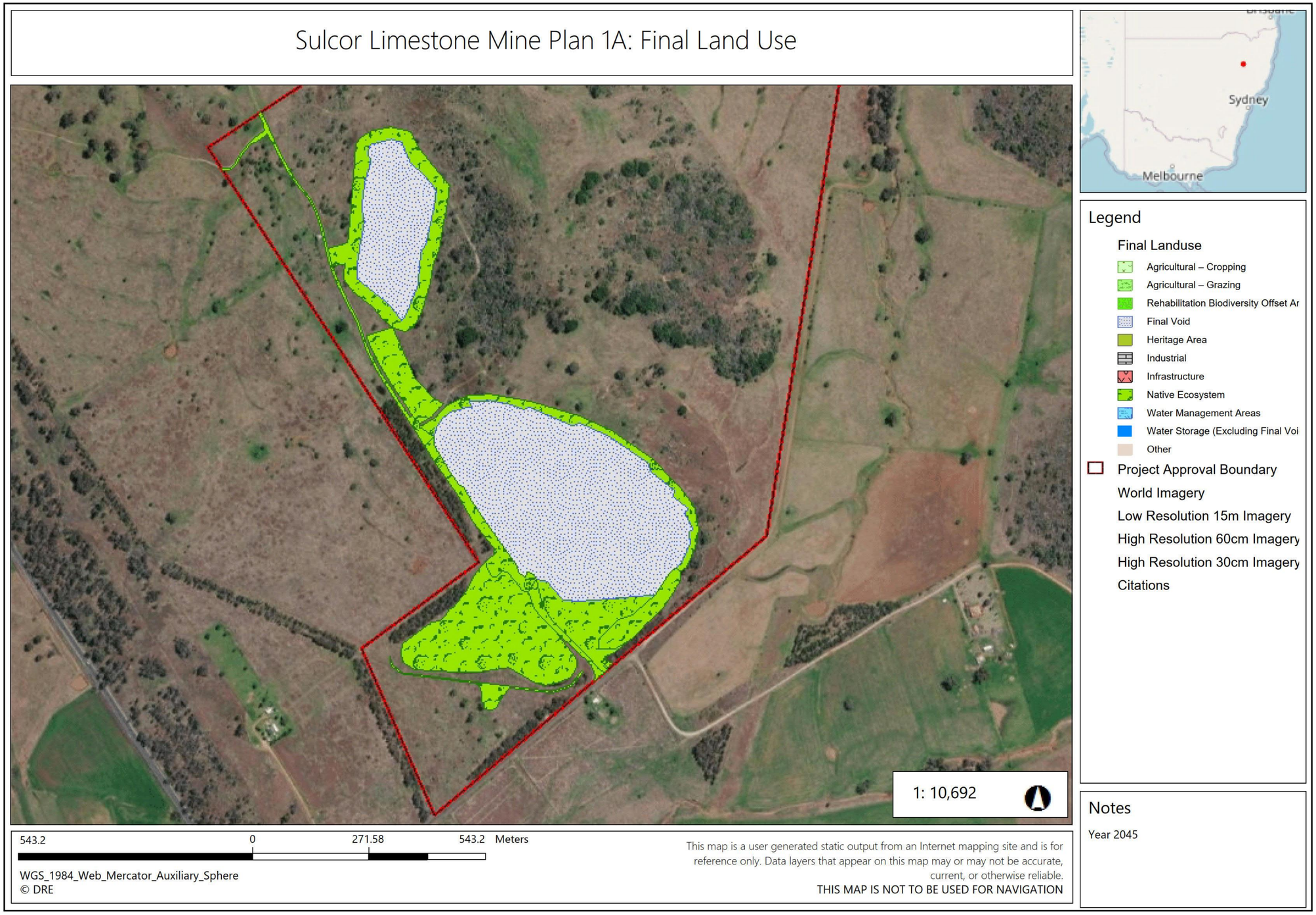

Figure 2: Final landform and rehabilitation plan - Final land use

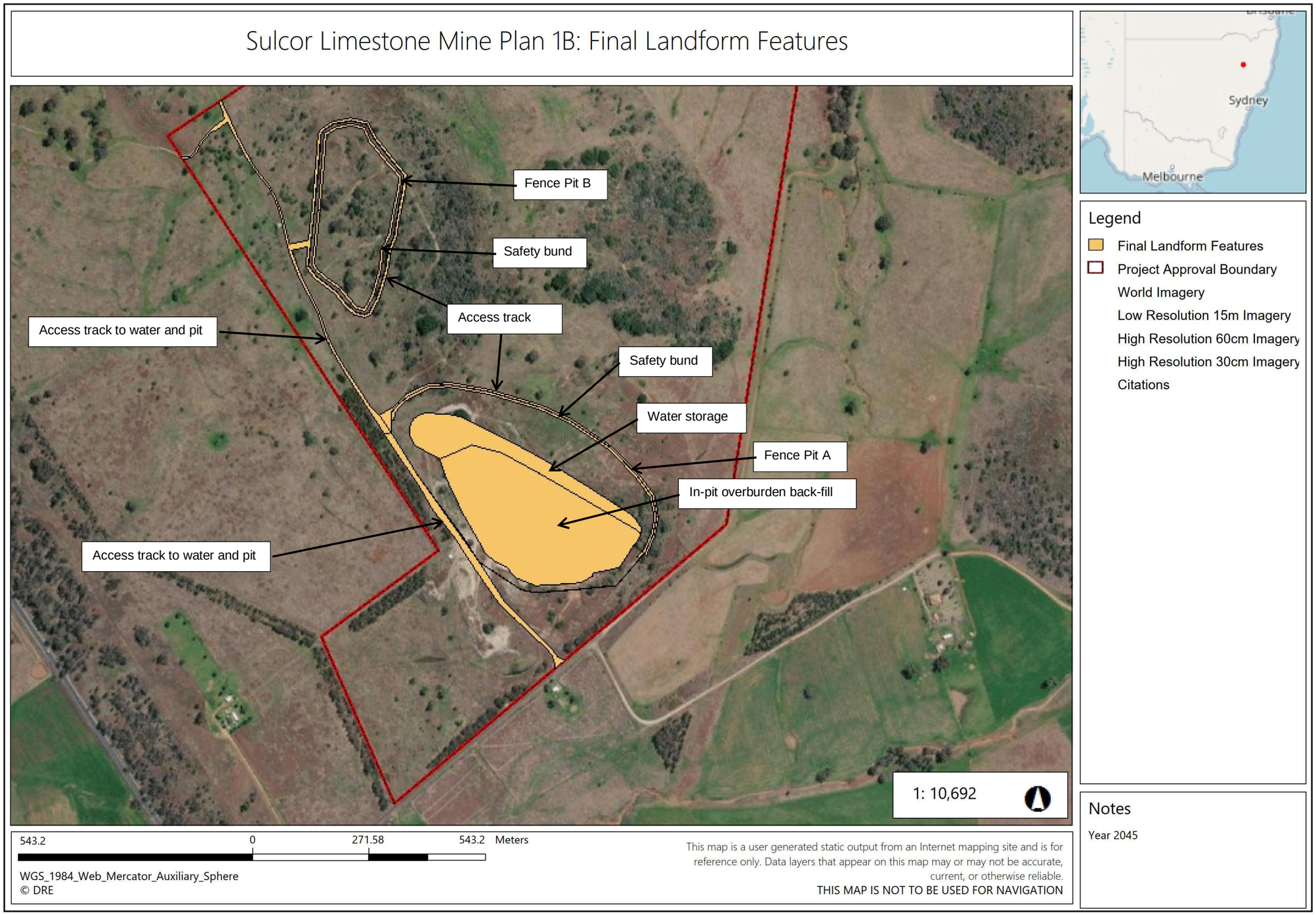

Figure 3: Final landform and rehabilitation plan - Final landform Features

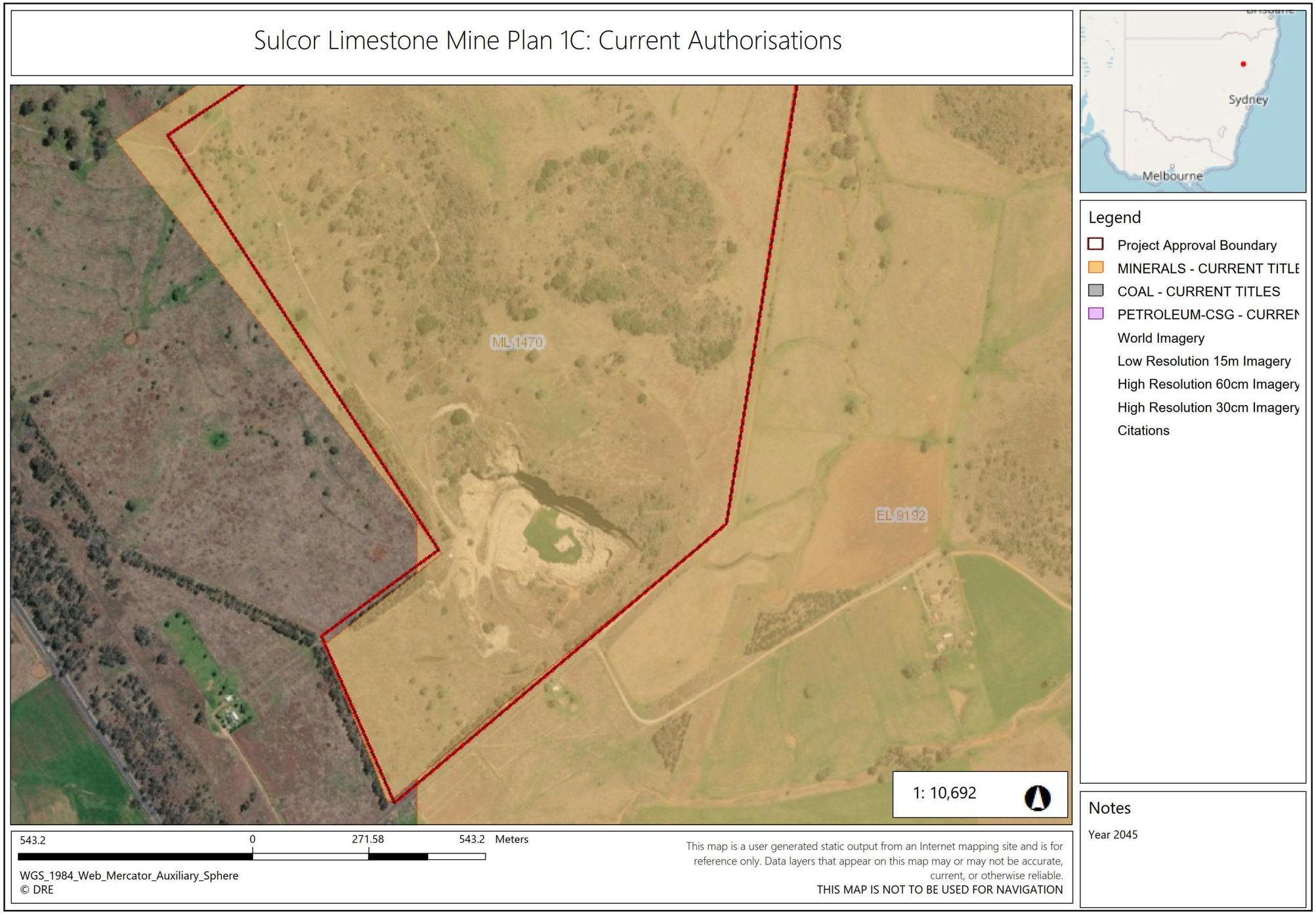

Figure 4: Final landform and rehabilitation plan – Current Authorisations

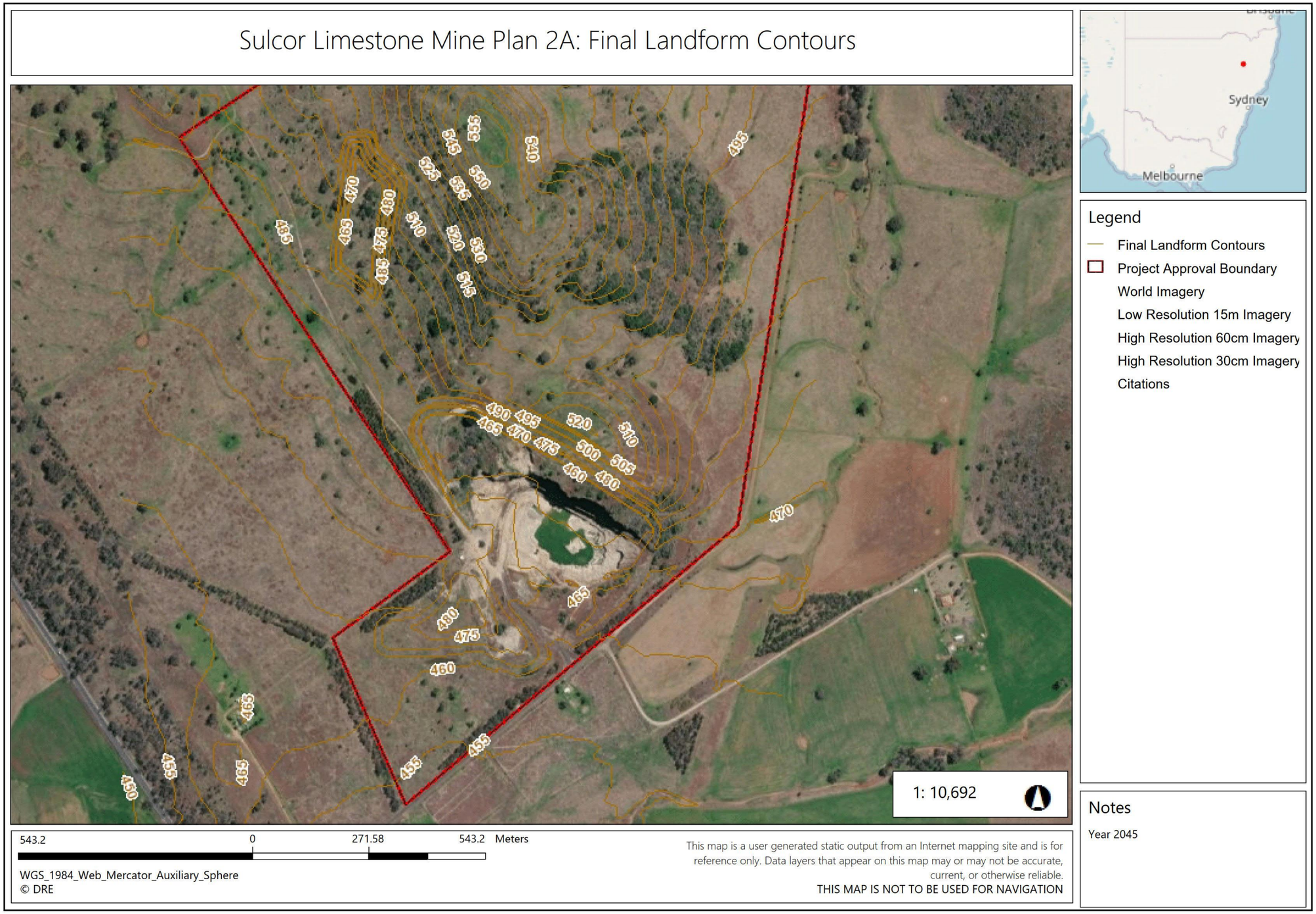

Figure 5: Final landform and rehabilitation plan - Final landform contours

6. Rehabilitation implementation

6.1 Life of mine rehabilitation schedule

Table 11 presents the proposed rehabilitation schedule from 2022 to 2038 at yearly and five-yearly intervals.

Table 11: Rehabilitation mine schedule

Disturbance ID	Area Description	Final Land Use Domain	Area (m^2)	Rehabilitation Phase – as of May 2022	Rehabilitation Start Date	Rehab Status 2022	Rehab Status 2023	Rehab Status 2024	Rehab Status 2027	Rehab Status 2032	Rehab Status 2037	Rehab Status 2042	Year 2045 (End of Life)
Infrastructure Area Domain													
IA1	Bitumen road	Infrastructure	2,885	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
IA2	Laydown area roads	Agriculture - Grazing	3,259	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Development	Rehabilitation Competition
IA3	Western haul road	Infrastructure	9,128	Active Mining Area	2045	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
IA4	Temp mine haul roads	Final Void	7,870	Active Mining Area	2045	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
IA5	Road to Shariona Park	Infrastructure	5,005	Active Mining Area	2045	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
IA6	Stockpiles roads	Agriculture - Grazing	1,898	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Development	Rehabilitation Competition
IA7	Access road around north wall	Infrastructure	11,485	Active Mining Area	2042	N/A	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
IA8	Stockpile area	Agriculture - Grazing	9,849	Active Mining Area	2042	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Development	Rehabilitation Competition
Environmental restoration and maintenance works - Historical vegetation screens and acoustic bunds. No mining domain.													
R1	Environmental restoration and maintenance works	Native Ecosystem	11,761	Ecosystem and Land Use Development	2001	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R2	Environmental restoration and maintenance works	Native Ecosystem	9,241	Ecosystem and Land Use Development	2001	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R3	Environmental restoration and maintenance works	Native Ecosystem	3,215	Ecosystem and Land Use Development	2001	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition

Disturbance ID	Area Description	Final Land Use Domain	Area (m^2)	Rehabilitation Phase – as of May 2022	Rehabilitation Start Date	Rehab Status 2022	Rehab Status 2023	Rehab Status 2024	Rehab Status 2027	Rehab Status 2032	Rehab Status 2037	Rehab Status 2042	Year 2045 (End of Life)
R4	Environmental restoration and maintenance works	Native Ecosystem	9,329	Ecosystem and Land Use Development	2001	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R5-1	Environmental restoration and maintenance works	Native Ecosystem	7,440	Ecosystem and Land Use Development	2001	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R5-2	Environmental restoration and maintenance works	Native Ecosystem	7,043	Ecosystem and Land Use Establishment	2001	Ecosystem and Land Use Establishment	Ecosystem and Land Use Establishment	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R6	Environmental restoration and maintenance works	Native Ecosystem	5,691	Ecosystem and Land Use Development	2003	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R7	Environmental restoration and maintenance works	Native Ecosystem	4,605	Ecosystem and Land Use Development	2003	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
R8	Environmental restoration and maintenance works	Native Ecosystem	13,426	Ecosystem and Land Use Establishment	2003	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition	Rehabilitation Competition
Overburden Emplacement Area Domain													
OEA1	Main overburden emplacement	Agriculture - Grazing	8,726	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Establishment	Rehabilitation Competition
OEA1 Batter	Main overburden Batter	Agriculture - Grazing	3,599	Active Mining Area	2027	Active Mining Area	Active Mining Area	Active Mining Area	Landform Establishment	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition
OEA2	Stockpile	Agriculture - Grazing	4,278	Active Mining Area	2032	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Growth Media Development	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition
OEA3	Stockpile	Agriculture - Grazing	1,946	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Development	Rehabilitation Competition
OEA4	Topsoil storage	Agriculture - Grazing	10,309	Active Mining Area	2042	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Establishment	Rehabilitation Competition
OEA5	Main overburden emplacement	Agriculture - Grazing	1,420	Active Mining Area	2042	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Establishment	Rehabilitation Competition

Disturbance ID	Area Description	Final Land Use Domain	Area (m^2)	Rehabilitation Phase – as of May 2022	Rehabilitation Start Date	Rehab Status 2022	Rehab Status 2023	Rehab Status 2024	Rehab Status 2027	Rehab Status 2032	Rehab Status 2037	Rehab Status 2042	Year 2045 (End of Life)
OEA5 Batter	Main overburden Batter	Agriculture - Grazing	5,082	Active Mining Area	2027	N/A	Active Mining Area	Active Mining Area	Growth Media Development	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition
OEA6	Main overburden emplacement	Agriculture - Grazing	6,445	Active Mining Area	2042	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Ecosystem and Land Use Establishment	Rehabilitation Competition
OEA6 Batter	Main overburden Batter	Agriculture - Grazing	3,599	Active Mining Area	2032	N/A	N/A	N/A	Active Mining Area	Growth Media Development	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition
OEA7	Main overburden emplacement	Agriculture - Grazing	4,231	Active Mining Area	2042	N/A	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Ecosystem and Land Use Establishment	Rehabilitation Competition
OEA7 Batter	Main overburden Batter	Agriculture - Grazing	6,372	Active Mining Area	2032	N/A	N/A	N/A	N/A	Growth Media Development	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition
Active Mining Area													
AMA1	Current pit	Final Void	65,418	Active Mining Area	2045	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
AMA2	Pit Expansion Yr1-3	Final Void	14,545	Active Mining Area	2045	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
AMA3	Pit Expansion P1	Final Void	11,164	Active Mining Area	2045	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
AMA4	Pit Expansion P2	Final Void	15,346	Active Mining Area	2045	N/A	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition
AMA5	Pit Expansion P3	Final Void	10,648	Active Mining Area	2045	N/A	N/A	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Rehabilitation Competition
AMA6	Pit Expansion P4	Final Void	5,960	Active Mining Area	2045	N/A	N/A	N/A	N/A	N/A	N/A	Active Mining Area	Rehabilitation Competition
Water Management Area													
WMA1	Water catchment bund	Agriculture – Grazing	1,814	Active Mining Area	2027	Active Mining Area	Active Mining Area	Active Mining Area	Landform Establishment	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition
WMA2	OEA sediment ponds	Agriculture – Grazing	745	Active Mining Area	2027	Active Mining Area	Active Mining Area	Active Mining Area	Landform Establishment	Ecosystem and Land Use Establishment	Ecosystem and Land Use Development	Rehabilitation Competition	Rehabilitation Competition
WMA3	New sediment pond	Water Management Area	3,171	Active Mining Area	2045	N/A	N/A	N/A	Active Mining Area	Active Mining Area	Active Mining Area	Active Mining Area	Rehabilitation Competition

6.1.1 Rehabilitation from 2001 – 2022

Extensive tree and shrub plantings have been established in the areas designated by the Sulcor Environmental Plan (R1, R2, R3, R4 and R5). Further tree and shrub plantings have been made in areas to the Northwest of Pit A (R8), along the Travelling Stock Route (R7), joining plantation at R1 and the vegetation corridor to the south of the Mine Lease (R6). These environmental restoration and maintenance works are now at the Ecosystem and Land Use development stage.

Table 12 Environmental restoration works details and status

Restoration works area	Description	Landform & Establishment Vegetation	Area m^2	No of trees	Aim of land use	Status
R1	Old railway easement	2001	11,982	822	Visual screen	Complete
R2	Kirk site screen	2001	11,222	727	Visual screen	Complete
R3	Clout site screen	2001	5,147	338	Visual screen	Complete
R4	McMahon site screen	2001	14,519	995	Visual screen	Complete
R5	Pit A site screen	2001	9,519	433	Visual screen	Complete
R6	Corridor plantation	2003	5,691	379	Veg corridor	Complete
R7	Corridor plantation	2003	4,604	307	Veg corridor	Complete
R8	Corridor plantation	2003	13,427	895	Veg corridor	Complete

6.1.1 Rehabilitation year 2022

Figure 6 shows that the rehabilitation plans for the year include no expansion of existing rehabilitation sites and no commencing of rehabilitation for mining disturbed areas. Maintenance will be performed on rehabilitation area internally identified as R5, to improve vegetation uptake. This will include sowing of new vegetation and any measures needed for soil health that are deemed necessary.

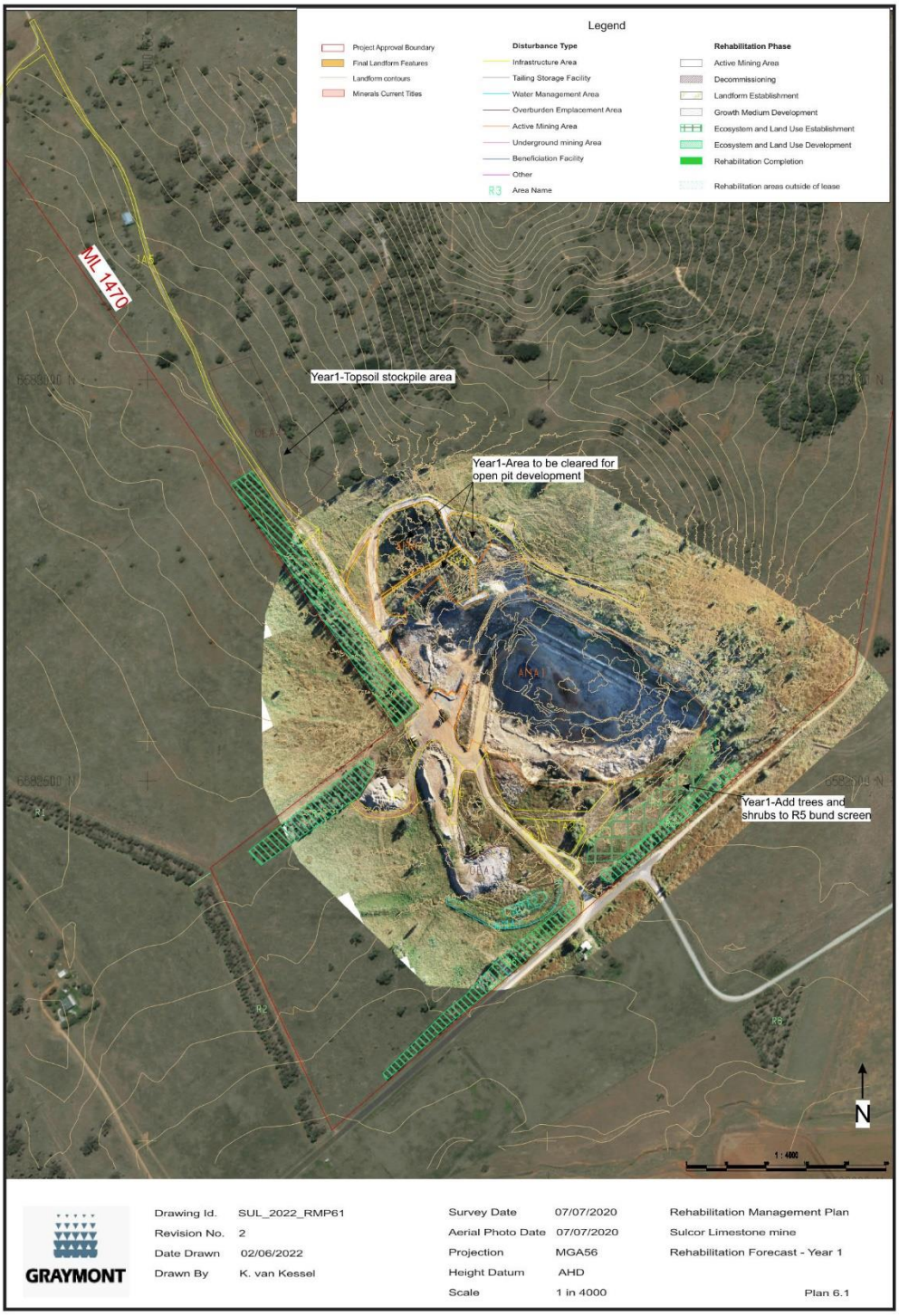

Figure 6: Rehabilitation by the end of 2022

6.1.2 Rehabilitation year 2023

Figure 7 shows the rehabilitation plans for 2023. This includes monitoring of environmental restoration work of R5 site to facilitate the process of further establishment.

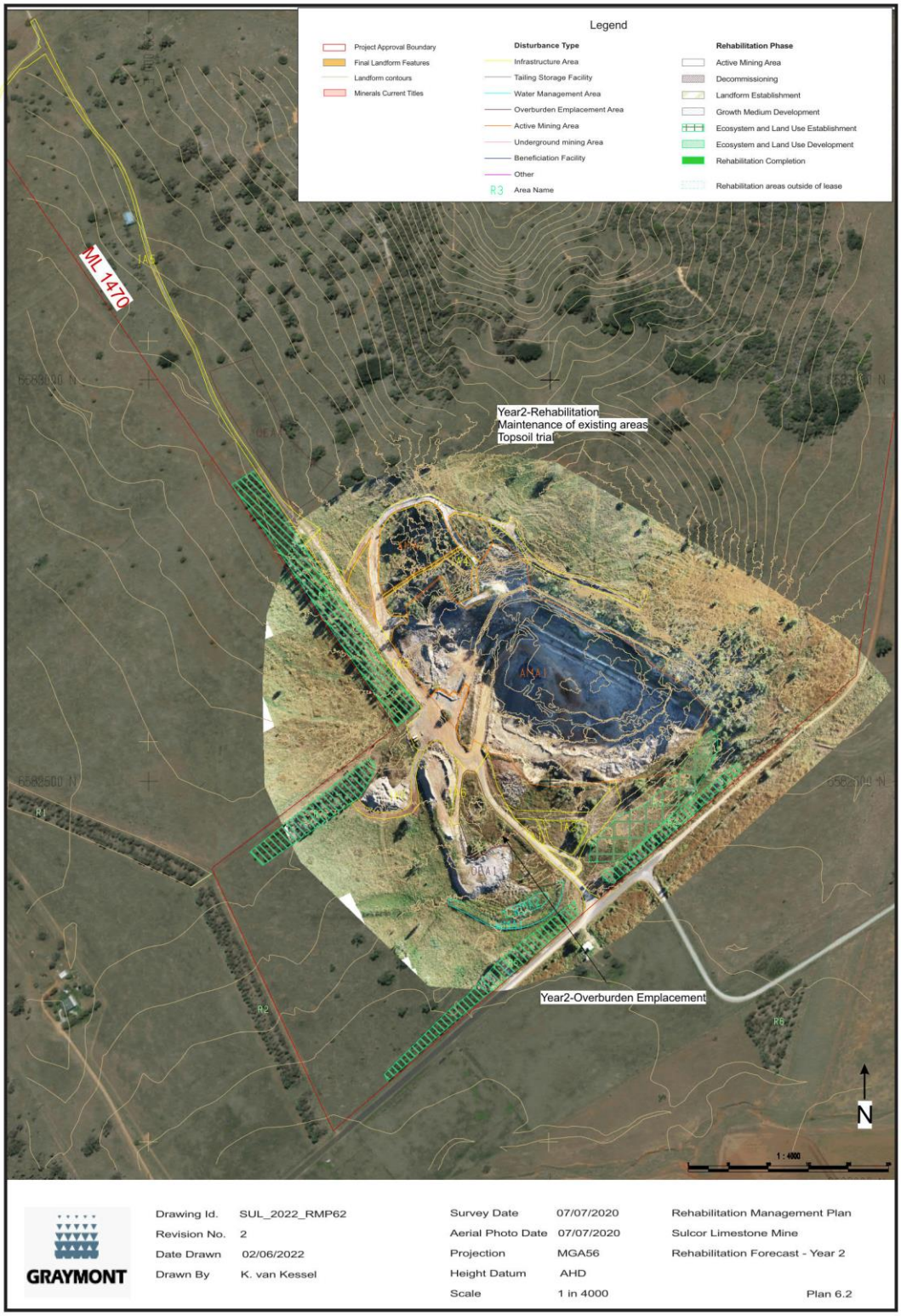

Figure 7: Rehabilitation by the end of 2023

6.1.3 Rehabilitation year 2024

Figure 8 shows the rehabilitation plans for 2024. This includes the commencement of the landform establishment phase for the overburden emplacement area OEA5.

Figure 8: Rehabilitation by the end of 2024

6.1.4 Rehabilitation year 2027

Figure 9 shows the proposed rehabilitation activities to be completed by 2027. Overburden emplacement areas OEA1B and OEA5 will be in the landform establishment and growth medium development phases, respectively.

Figure 9: Rehabilitation by the end of 2027

6.1.5 Rehabilitation year 2032

Figure 10 shows the proposed rehabilitation activities to be completed by 2032. OEA1B and OEA5 are expected to be in the ecosystem and land use establishment phase. OEA2, OEA6B and OEA7B are intended to be in the growth medium development stage.

Figure 10: Rehabilitation by the end of 2032

6.1.6 Rehabilitation year 2037

Figure 11 shows the proposed rehabilitation activities to be completed by 2037. OEA1B and OEA5 are expected to be in the ecosystem and land use development phase. OEA2, OEA6B and OEA7B are expected to be in the ecosystem and land use establishment stage.

Figure 11: Rehabilitation by the end of 2037

6.1.7 Rehabilitation year 2042

Figure 12 shows the proposed rehabilitation activities to be completed by 2042. Overburden emplacement areas OEA1, OEA6 and OEA7 will be intended to be in the ecosystem and land use development phase, while OEA4 is intended to be in the ecosystem and land use establishment phase.

Figure 12: Rehabilitation by the end of 2042

6.1.8 Rehabilitation by 2045 (End of Life)

Figure 13 presents the rehabilitation schedule to be completed by the end of the year 2045. All disturbed areas are expected to be completed rehabilitated by this time.

Figure 13: End of life rehabilitation by 2045

6.2 Phases of rehabilitation and general methodologies

6.2.1 Active mining phase of rehabilitation

General methodology

The rehabilitation methodology in this phase is driven by activities and controls focused on soils and materials management, material handling, environmental monitoring, and planning for rehabilitation.

Soil and materials management

Develop and maintain a materials and soils balance and database to include the following information:

- Volume of inert capping material, topsoil and subsoil stockpiled
- Location, age and quality of stockpiles
- Chronology of treatments including weed control and application of cover crop undertaken on the stockpile
- Volume of material, topsoil and subsoil required for application to current and future disturbance areas.
- An estimate of the volume of suitable alternative material required to be imported onto site to supplement potential material, topsoil and subsoil deficits (if required); and
- Record data on the location of the stockpiled material including date stripped, source area, indicative volume, pre-strip plant community type.

Materials and waste handling

Develop specific strategies for mine materials management to address potential geochemical and geotechnical constraints for rehabilitation as follows:

- Continued sampling and testing of overburden/interburden materials during operations to confirm the potential geochemical constraints across the deposit
- Continued sampling to ensure materials are understood (e.g. particle size distribution) and to identify potential changes in material properties
- Development of a register of contaminated sites and waste landfill sites areas and where they are located; and
- Development of strategies for disposal or stockpiling of processing waste materials from the hydration and calcination to avoid poor rehabilitation outcomes.

Environmental Monitoring

Maintain and document an environmental monitoring program that includes the following environmental matters.

- Surface and groundwater
- Flora and fauna
- Pasture monitoring and or agricultural capacity
- Soil and erosion; and
- Weed assessment and control.

Planning for rehabilitation

When planning for rehabilitation the key focus areas will include:

- Landform establishment
- Topsoil and growth media development
- Revegetation
- Weed management; and
- Record Keeping.

Site conditions

The below matters summarise the site conditions and the risks and opportunities for rehabilitation associated with the active mining phase across the mining domains. The following sections are paraphrased from the 1999 EIS and subsequent documents.

Soils and materials

Topsoil is a red-brown earth with exposed limestone rock comprising up to 50% of the ground surface on the central hill. The depth and coverage of soil increases down slope to a point where the land is cultivatable.

Flora

A flora and fauna assessment undertaken by Ecological (2016) identified the following flora and fauna values within the areas to be disturbed by future mining. The study area comprises a highly disturbed landscape impacted by previous agricultural and mining activities, which supports a box gum woodland community heavily impacted by exotic weed invasion. Despite the observed degradation, the vegetation communities present within the proposed disturbance area are classified as White Box-Yellow Box-Blakely's Red Gum Grassy Woodland, an Endangered Ecological Community and Critically Endangered Ecological Community (CEEC) as described under the TSC Act and EPBC Act respectively and exotic dominated grasslands.

The area described as White Box-Yellow Box-Blakely's Red Gum Grassy Woodland has a canopy dominated by Eucalyptus melliodora (Yellow Box), E. albens (White Box) and E. blakelyi (Blakely's Red Gum) with an understorey in most sections containing few native species and high cover of Coolatai Grass. Native tussock grasses and forbs persist in some small patches scattered across the area, however the community exists generally in a degraded state as a result of former clearing and invasion of exotics such as Coolatai Grass. Tree density is low, being approximately 2 trees per ha within the proposed disturbance area and adjacent land into which the community extends (Figure 5).

Small patches of this community, in the form of planted tree screens, are in better condition and meet the criteria of the CEEC listed under the EPBC Act, as within these patches the understorey is dominated by native species and contain several 'important species' (DotE, 2016c) including:

- Bulbine bulbosa (Native Leek)
- Calotis cuneifolia (Purple Burr-daisy)
- Calotis lappulacea (Mallee Burr-daisy)
- Glycine tabacina
- Sida corrugata (Corrugated Sida)

The ground layer comprised a mix of native and exotic grasses and forbs but was dominated by Coolatai Grass, an invasive weed recognised for its deleterious impacts on the health of box gum woodland communities. Coolatai Grass was estimated to cover 75% of the study area. Coolatai Grass is a serious agricultural weed, having been declared noxious in many local government areas across NSW. It is resistant to fire and drought and is tolerant of many herbicides. Lycium ferocissimum (African Boxthorn) is also common, a declared weed of national significance declared noxious weed across NSW.

A formal weed control program will be developed. This shall focus on the management of introduced Coolatai Grass, African Boxthorn and other priority weeds .

Fauna

The Ecological (2016) survey found twenty-four fauna species, mainly birds, as well as several mammals (Eastern Grey Kangaroo, Wallaroo and Red-necked Wallaby). Introduced species including Manorina melanocephala (Noisy Miner) and Felis catus (Feral Cat) were identified, the actions of both of which are listed as key threatening processes under the TSC Act and EPBC Act. AnaBat ultrasonic recorders identified the potential presence of two threatened species, Vespadelus troughtoni (Eastern Cave Bat) and Miniopterus orianae oceanensis (Eastern Bent-winged Bat), however general microbat activity was very low with calls recorded less often than once every half hour throughout each evening on average.

Rock/overburden emplacement

Continued activity in Pit A is unlikely to generate significant amounts of waste material such as overburden. It is expected that any overburden generated can be either placed within the pit area or handled on the existing waste emplacement. The current waste emplacement usage is at 40% of the total available final capacity.

A new overburden emplacement would be established closer to pit B for material from Pit B.

Waste Management

The sulcor site produces very little waste material. Any wastes are transported offsite and disposed to a licensed facility.

Geology and geochemistry

The Mining lease features an extensively outcropped central Limestone ridge approximately 2km long by 0.75km wide, running north – south. The ridge is surrounded by Colluvial and Alluvial slopes. These areas are used for agriculture, including cropping and grazing activities. The central ridge is of limited agricultural use except for some grazing due to outcropping limestone and shallow soils. There are two main limestone formations present on the lease.

1. The Sulcor Limestone Member - located to the Southern end of the lease. This includes the existing Sulcor quarry (Pit A). Recent drilling has identified an extension of Pit A towards the north; and
2. The Moore Creek Limestone Member – located in the Northern half of the lease.

Reserves of 7,500,000 tonnes are estimated to remain in the existing Sulcor pit (Pit A Extension). Additional limestone resources are present on the lease but have not been defined quantitatively. Neither the Geology nor Geochemistry is expected to contribute to any specific environmental risk.

Material prone to spontaneous combustion

No issues relating to spontaneous combustion have been identified at the Sulcor site.

Material prone to generating acid mine drainage

No issues relating to generating acid mine drainage have been identified at the Sulcor site.

Ore beneficiation waste management (reject and tailings disposal)

There is no ore beneficiation or associated waste on site.

Erosion and sediment control

Erosion control will focus on reducing the concentration of runoff, increasing infiltration and providing soil surface cover. Erosion control works will include:

- Amelioration of dispersive soil to minimise the risk of rill, gully and tunnel erosion and to allow the infiltration of surface water (reduce the amount and velocity of surface water)
- Contour scarification to increase infiltration, reduce flow velocity and to incorporate soil ameliorants; and
- Ground cover vegetation is established promptly following commencement of rehabilitation works to prevent raindrop and sheet erosion of the overburden emplacements. The seed mixture will include at least three cover crop species that will grow quickly to provide early groundcover, even if that species will not form part of the final, permanent vegetation.

Ongoing management of biological resources for use in rehabilitation

Ongoing management for biological resources includes the following activities:

- Sprinkler systems utilised to suppress dust on stockpiles
- Regular inspection of stockpiles
- Topsoil testing from stored stockpiles prior to re-spreading
- Topsoil stockpiles are limited to 2m in height and will be vegetated with an identified appropriate grass species
- Overburden emplacement batters will be vegetated to minimise erosion and dirty water runoff
- Surface water runoff diverted by earthen bunds and drainage channels to pit void; and
- Surface water runoff collected in pit void is reused onsite or pumped to sediment basins prior to discharge.
- Scheduled weed control inspections.

Mine subsidence

No issues relating to mine subsidence have been identified at the Sulcor site.

Aboriginal Heritage

No activities are planned that will affect the previously identified sites. Routine monitoring will be undertaken to ensure fencing around previously identified sites is maintained. In the event that an Aboriginal object is found, works in the vicinity of the object will cease immediately, and the relevant authorities notified.

Natural Heritage

No activities are planned that will affect the previously identified sites.

Exploration activities

The geology of the Mining Lease is generally well understood, and there is no scope for any significant further reserves to be discovered. Further drilling may be required to better define existing reserves. This will be discussed with the Resource Regulator – Regional NSW, as required, with all necessary approvals granted, prior to work commencing.

6.2.2 Decommissioning

The decommissioning phase for the Sulcor site will include activities associated with removing mining infrastructure and the removal and/or remediation of contaminants and hazardous materials if required. This rehabilitation phase may also include studies and assessments related to decommissioning and demolition of infrastructure or works carried out to make safe or 'fit for purpose' built infrastructure to be retained for future use(s) following lease relinquishment.

A detailed decommissioning procedure will be developed in a future update of this RMP closer to the end of mine life. This will guide activities at the end of the mine operations and detail the resources needed to undertake those activities. The decommissioning procedure will include the process for undertaking decommissioning and closure activities, complying with all legal obligations, and communicating to minimise the risk of safety and environmental incidents. In addition, the decommissioning procedure will outline how all the infrastructure remaining at the end of the mining lease is to be managed and financed into the future and provide opportunity for the community and other stakeholders to provide input.

Generally, the decommissioning procedure will address the following:

- Before demolition, all infrastructure should be evaluated in terms of the presence of hazardous substances and land contamination, and appropriate management strategies developed to protect employees, the public and minimise potential environmental harm. This includes the identification of the various waste streams and development of management strategies in accordance with the appropriate waste legislation
- Before demolition activities, undertake or review existing assessments to determine potential heritage approvals and or management measures that may be required; these may include heritage management plans, retention/restoration of buildings, archival recording and dilapidation studies
- Electricity services to any infrastructure scheduled for demolition will be removed before the start of building demolition works
- Telecommunications, water supply and other services will also be disconnected and removed where practical
- Where services are buried (e.g. pipelines, cables) and their retrieval may lead to further disturbance, the infrastructure may be left in situ (subject to any necessary approvals or agreements) if they don't pose constraints to the final land use. In this situation, the location of the services will be surveyed and marked on the site plan and a suitable caveat developed to provide that they are readily identifiable for future land holders
- All buildings, fixed plant and other infrastructure that are not required as part of the final land use will be demolished and removed. Demolition will be carried out in accordance with the AS 2601—2001, *The demolition of structures*. Approval for demolition will be reviewed closer to the demolition date as the this activity may be exempt under Clause 2.13 (c) of the State Environmental Planning Policy (Resources and Energy) 2021, which states that '*the demolition of a building or structure that is carried out in accordance with Australian Standard AS 2601—2001, The demolition of structures, but only if the building or structure is not, or is not part of, a heritage item, or in a heritage conservation area, identified by an environmental planning instrument,'*; and
- Remaining structures will be surveyed and recorded on a plan, developed to provide that they are readily identifiable for future land holders (as appropriate).

Site security

Site security management will include physical and operational measures to promote work health and safety and prevent access by members of the public to site. Physical and operational site security may include:

- Access control – as well as minimal access points, this includes installing suitable security gating so that gates cannot be simply unhinged after hours
- Fencing and barries – the final void will be isolated using a physical barrier around mine void constructed to limit access by people and stock to unsafe areas. A locked gate will be installed as part of the barrier around mine void to permit stock access and allow for irrigation of water from the mine void, as required
- Locks – the site will include lockable storage such as steel tool vaults and containment so that all equipment, tools, metals and materials can be secured out of sight overnight and when not in use
- Provision and monitoring of risk management, assessment and health and safety protocols; and
- Entry and exit monitoring.

Infrastructure to be removed or demolished

The following items will be removed and or demolished during the decommissioning phase.

- Relocatable buildings
- Electricity, water, septic system and telecommunications infrastructure
- Fuel and oil storage facilities and generator
- Concrete pads and footings; and
- Decommission dirty water dams (Drain and removed sediments to make dam clean water or drain and minor earthworks to fill in dam).

Buildings, structures and fixed plant to be retained

Some roads will be retained for property access, bushfire fighting and rehabilitation monitoring purposes. The structural integrity and possible risk of the proposed retained roads will be verified and addressed by a qualify engineer upon mining closure.

Management of carbonaceous/contaminated material

There is no carbonaceous material onsite and no known contaminated material.

Hazardous materials management

A register of hazardous substances used on site is maintained. The register is updated when new materials are brought into use on site. The site also has access to on line hazardous substance databases which can provide detail information on chemicals including SDS's as required. Following the cessation of the mining operation, the following material must be removed from site as required.

- **Fuel Containment:** Both diesel and waste oil fuels are stored in above-ground tanks built to relevant standards. The quantity of diesel stored on site is less than 40Kl
- **Explosives:** Explosives are generally not stored on site. The site does have suitably designed magazines for temporary storage. A site security plan has been developed and implemented
- **Oil & Grease:** Oils and grease are stored adjacent to the main fuel tank within the bunded containment area. Used oils are stored in a tank located in the same bunded area. Used oil is collected by a licensed contractor for disposal; and
- **Gas Bottle Storage:** Gas bottles are stored in a segregated compound of block construction**.**

Underground infrastructure

The Decommissioning procedure will also address the following:

- Removal of remote equipment (e.g. powerlines to remote shafts, ventilation infrastructure, PED lines, services boreholes, pipeline); and
- The need to undertake a hydrological assessment and develop a groundwater management strategy and monitoring (if required). This may require the development of water treatment strategies and subsequent approvals from relevant agencies.

6.2.3 Landform establishment

The landform establishment phase of rehabilitation consists of the processes and activities required to construct the approved final landform as per the Chapter 5 of this document.

Water management infrastructure

There are currently two water management areas. The first one wraps around a small part of the southern end of the overburden area, closest to Sulcor Rd. The second one sits just above the first. The bund at the site's southern end will continue to serve as a water catchment and hence is a water management area. Maintenance of these water management areas will include:

- Removal of excess sediment from the surface dams for future use by the subsequent land owner
- The installation of appropriate sediment and erosion control measures (if required); and
- Water within the final void will be appropriately licensed in perpetuity under the Water Management Act 2000).

Final landform construction: general requirements

During the final landform construction the following matters will be considered and addressed as relevant:

- Emplacement Areas: Overburden and waste rock emplacement areas are designed to enable progressive rehabilitation of all batter faces and benches prior to bulk waste rock emplacement, thereby minimising the extent of exposed surfaces liable to erode and minimising the magnitude of visual impacts. Emplacement areas will have a drainage system. A monitoring program will be in place to determine the drainage system's effectiveness, including a trigger action response plan (TARP) to address issues
- Final void: The final void on site has been approved to remain as part of the final landform as stated in the EIS prepared for the DA 99/307. Therefore, the design and construction will be following the minimum requirements of the development consent, associated environmental assessments/environmental impact statements, and in consideration of the following:
    - A geotechnical assessment should be undertaken to determine the likely long-term stability risks associated with the proposed final landform, including any remaining high walls or low walls. Based on the outcome of this assessment, suitable measures are to be implemented to minimise potential risks and support the final land use
    - Updated surface and groundwater assessments should be undertaken concerning the likely final water level in the void and post-mining water take, including groundwater inflows into the void and surface water capture
    - The final stabilisation and revegetation strategy associated with the final void should be designed and implemented based on the outcomes of the above assessments; and
    - The final void must address any relevant approval requirements of regulatory authorities and demonstrate the satisfaction of licensing requirements under the relevant legislation including the Water Management Act 2000.

Final landform construction: reject emplacement areas and tailing dams

There are no tailings dams on site. Final landform construction of the reject emplacement, including overburden and waste rock emplacement would involve:

- Run-of-mine waste rock lies at an angle of repose of 35° (70%). This will be re-profiled such that external batter are formed at a grade of 1:3 (V:H), or less. The batters would be separated by 5 m wide benches at 10 m vertical intervals. Emphasis would be placed upon creating a final surface that has an uneven appearance with large rocks scattered across the final cover. This final appearance would reflect the familiar natural outcrop in areas not yet mined. Benches would be constructed with a 5 per cent backslope and a longitudinal slope of 0.5 per cent for drainage purposes
- The batter slopes of waste emplacement areas will be constructed using existing methods which have been assessed by an authorised consultant as performing acceptably
- Moonscaping would be undertaken in those areas of the waste rock emplacements suited for this treatment, such as short steep batters; and
- Batters will be covered with at least 0.5m (where available) of subsoil like material to aid moisture and nutrient retention. Final capping with topsoil would then proceed as described in section 6.2.4.

Final landform construction: final voids, high walls and low walls

Although the open-cut Pits A and B would remain as a final void on cessation of mining, specific rehabilitation procedures would be applied during mining operations to achieve the rehabilitation objectives. The construction of the final landform would include:

- Pit A will be partially backfilled with waste rock and clay from Pit B. This waste material will also create rill slopes at the foot of the faces and spread over benches. In the absence of topsoil, this clayey waste material will provide an alternative growth medium for revegetation within the mine void.
- The floor of Pit A will progressively fill with groundwater to a depth of approximately 10 metres. This water will be useful both as storage for agricultural - grazing purposes and as a wildlife habitat.
- Pit B will be left as a dry, open void. Edges of benches will be shot to provide material for rill slopes at the foot of these benches, which will then be planted with trees.

Construction of creek/river diversion works

The final landform for the Sulcor site does not include construction of any creek or river diversion works.

6.2.4 Growth medium development

This phase of rehabilitation consists of activities required to establish the physical, chemical and biological components of the substrate required to establish the desired vegetation community to ensure achievement of the approved rehabilitation objectives and rehabilitation completion criteria and final landform. During this phase the following activities will be undertaken:

Soil stripping and handling

There is topsoil stored on-site for rehabilitation purposes. Prior to re-spreading of stockpiled topsoil onto reshaped batters and benches, a visual assessment of weed infestation will be undertaken to determine if individual stockpiles require scalping or burial due to their unsuitability as a result of weed infestation. Topsoil and subsoil stockpiles will be treated annually and additionally as required to control weeds, in accordance with the Weed Management Plan. The site HSEQ advisor is responsible for implementation of the Weed Management Plan.

Soil and overburden characterisation will also be undertaken to assess the suitability of the material as a growing media. Soil testing will address chemical factors including pH, electrical conductivity and general fertility. Physical factors such as texture and degree of stoniness will be assessed in consideration of material suitability as a growing media. Some rock and gravel in the soil profile are desirable to facilitate water penetration deeper into the soil profile and minimise evaporative losses. This is particularly important when rehabilitating for a nature conservation post mine land use.

The estimated topsoil quantity available at this early stage of mining is 500 m^3.

Surface preparation

Areas to be rehabilitated will be reshaped to achieve the desired landform and checked to ensure that desired batter grades and slope lengths are achieved. Suitable stormwater drainage measures shall be incorporated.

Surfaces will generally be contour ripped to a nominal depth of 300mm to incorporate ameliorants into the overburden and to encourage infiltration of water and improve keying in of topsoil.

Contour scarification of topsoil is undertaken to incorporate soil ameliorants into the plant rooting zone (to a depth of 100mm) and to provide a suitable seedbed for direct seeding. A roughened soil surface also increases rainfall infiltration, reduces run-off, and provides a micro-habitat allowing plants to germinate and establish.

Where possible ripping and scarification will be undertaken when the soil is moist to minimise structural decline and immediately prior to sowing. The respread topsoil surface will be scarified prior to, or during seeding.

Where topsoil resources allow, topsoil will be spread to a nominal depth of 100mm to 150mm on all regraded areas flatter than 1(v):3(h) and 50mm thick on areas steeper than 1(v):3(h).

Amelioration of growing media

Soil testing of topsoil and subsoil has been undertaken and will be used to determine amelioration requirements and rates. Fertiliser requirements will be assessed for type and rates in accordance with the planned vegetation for each area.

Where topsoil is unavailable or of insufficient quality, some of the site subsoils will be ameliorated to form a suitable growing media. A suitable guide to topsoil quality assessment would be undertaken to assess suitable alternatives such as biosolids, organic growth medium or another substitute, if required. However, the risk of introducing hazards to the establishment of the preferred plant community type (e.g., non-native species, elevated nutrient levels through the application of soil ameliorants) should be evaluated.

Erosion control

Erosion control will focus on reducing the concentration of runoff, increasing infiltration, and providing soil surface cover. Erosion control works will include:

- Amelioration of dispersive soil to minimise the risk of rill, gully, and tunnel erosion and to allow the infiltration of surface water (reduce the amount and velocity of surface water)
- Contour scarification to increase infiltration, reduce flow velocity and to incorporate soil ameliorants
- Ground cover vegetation is established promptly following commencement of rehabilitation works to prevent raindrop and sheet erosion of the overburden emplacements. The seed mixture will include at least three cover crop species that will grow quickly to provide early groundcover, even if that species will not form part of the final, permanent vegetation: and
- Implement erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction Volume 2E, Mines and Quarries (DECC 2008b).

6.2.5 Ecosystem and land use establishment

This phase of rehabilitation consists of the processes to establish the approved final land use following construction of the final landform. For vegetated land uses this rehabilitation phase includes establishing the desired vegetation community and implementing land management activities such as weed control.

At the Sulcor site revegetation activities associated with mine disturbance will be primarily aimed at restoring an Agricultural – Grazing land use. Native Vegetation land use domains are identified but these are associated with historical environmental works such as planted tree screens and acoustic bunds. These areas are in an ecosystem development phase and require little further intervention or active management.

Further advice of an agronomist will be sought to establish an appropriate seed mix for site revegetation. This is expected to include a range of native and improved pasture species including legumes. There are no specific targets for re-establishment of native species; however, selective tubestock planting of native shrubs and trees may be undertaken to improve habitat outcomes.

Rehabilitation establishment inspections, monitoring and maintenance

The following activities will be undertaken to ensure that the juvenile vegetation thrives during this rehabilitation phase:

- Inspections will be conducted no later than three months following the completion of each rehabilitation campaign to determine whether performance issues have occurred or are emerging, which may result in a delay revegetation establishment
- Inspections will be conducted to assess soil conditions and erosion, drainage and sediment control structures, runoff water quality, revegetation germination rates, plant health and weed infestation, until vegetation has become well established and the site can be considered stable
- Where possible, use drones or LiDAR to conduct additional inspections and analysis of developing rehabilitation
- Outcomes of inspections will be recorded to implement any required intervention/adaptive management actions as soon as practicable after a monitoring program indicates that rehabilitation performance is unsatisfactory as part of the rehabilitation management and maintenance program; and
- Implement long-term rehabilitation monitoring program and evaluate trajectory of rehabilitation against achieving rehabilitation objectives and rehabilitation completion criteria as per Chapter 8 of this document

6.2.6 Ecosystem and land use development

This phase of rehabilitation consists of the activities to manage maturing rehabilitation areas on a trajectory to achieving the rehabilitation objectives, rehabilitation completion criteria and final landform and rehabilitation plan.

The aim of this phase is to develop characteristics of functional self-sustaining ecosystems, such as nutrient recycling, vegetation flowering and reproduction, and increasing habitat complexity, and development of a productive, self-sustaining soil profile.

Maintenance and contingency

Maintenance/contingency works in the rehabilitation areas will be completed as required to address any issues of concern or unpredicted impact identified during monitoring. These works will include the following:

- Supplementary seeding of vegetated areas
- Weed and pest control
- Application of soil ameliorants; and
- Additional stabilisation.

Supplementary Seeding and tube stock planting

In the event that grass cover is initially insufficient to stabilise sloped areas due to slow growth rates (65 – 75% coverage), introduced sterile ground covers such as sterile Japanese Millet or Rye Corn may be used to supplement plantings.

- Supplementary seed broadcasting will be undertaken in areas where growth rates are considered insufficient or unsuccessful following monitoring. The seed for broadcasting will be treated where necessary prior to broadcasting to maximise germination rates
- Supplementary tube stock planting will be undertaken in areas where growth rates are considered insufficient or unsuccessful following monitoring; and
- Supplementary seed broadcasting will focus on ensuring desired shrub density and diversity is established in the rehabilitation areas.

Weeds and Pest Control

All noxious weeds within the Sulcor site will be controlled in accordance with the requirements of the Biosecurity Act 2015. A Weed Management Plan has been implemented. The continued monitoring of noxious weeds will reduce the potential for spread and provide control. This program ensures both a proactive and reactive approach to weed management.

Control strategies will include spot spraying in and around vegetation and boom spraying on the more open grasslands.

Predation of seedlings and tube stock by rabbits and kangaroos will be minimised using tree guards. As outlined in the TARP (Appendix C), Local Land Services NSW input will be consulted to implement an appropriate pest animal control plan if significant numbers are causing widespread damage to rehabilitation.

Application of Soil Ameliorants

Soil testing will be undertaken to determine amelioration requirements and rates. This will ensure the soil is ameliorated to ensure an optimum growing medium and further application of fertiliser will not be required.

Additional Stabilisation

Additional stabilisation works will be undertaken as required and may include reshaping, the installation of grade stabilisation structures, and amelioration of dispersive soil, revegetation, fencing and de-silting.

Stabilisation works are inspected as part of the Rapid Rehabilitation inspection program (Refer to Chapter 8).

6.3 Rehabilitation of areas affected by subsidence

The section does not apply as Sulcor site is not affected by mine subsidence. Therefore, no issues relating to mine subsidence have been identified at the Sulcor site.

7. Rehabilitation quality assurance process

A rehabilitation register will be developed and maintained for the Sulcor Mine. This will detail the current rehabilitation status and outline the rehabilitation works undertaken (including personnel responsible, landform preparation, drainage goals, growth media development, properties of soil media, surface preparation techniques, revegetation processes, and any follow-up corrective actions). In addition, the register will record success factors and lessons learned from previous reviews to assist future rehabilitation planning and improve outcomes. The rehabilitation register will be managed by the site HSEQ Advisor.

A Rehabilitation Quality Assurance Process (RQAP) will be implemented through the life of the mine and each phase of rehabilitation. The RQAP will ensure that:

- Rehabilitation is being implemented following the nominated methodologies
- Persons responsible for rehabilitation implementation are identified; and
- Identified rehabilitation risks are adequately addressed at each phase of rehabilitation.

The Sulcor site will implement the RQAP through every phase of rehabilitation. The RQAP will include inspections, monitoring and documentation to ensure that each phase of decommissioning and rehabilitation has been completed according to the nominated methodologies before proceeding to the next rehabilitation phase. Risks to rehabilitation are addressed in Chapter 3 of this RMP (rehabilitation risk assessment). The risk assessment is a live document that would be updated to address any emerging risks.

As part of the RQAP, a rehabilitation register will be developed and maintained. The register aims to record success factors and lessons learned from previous reviews to assist future rehabilitation planning and improve outcomes. This register will detail the current rehabilitation status and outline the rehabilitation works undertaken. The RQAP will be managed by the site HSEQ advisor.

The key elements of the rehabilitation quality assurance process and how they would be applied at each rehabilitation phase, are summarised in sections 7.1 to 7.6

7.1 RQAP – active mining

- Updated mine and rehabilitation plans
- Maintenance of a topsoil inventory to document stripped, stockpiled and re-spread resources
- Scheduled inspections to identify soil and land erosion and adequacy of soil, erosion and drainage controls
- Weed inspections and maintenance; and
- Documentation of all weed management and eradication programs and follow-up inspections.

7.2 RQAP – decommissioning

- Inspections and demolition reports to confirm all infrastructure has been removed
- Inspections and assessments to ensure any contamination has been appropriately remediated and/or removed; and
- Waste tracking documentation to demonstrate that all wastes are disposed legally.

7.3 RQAP – landform establishment

- Survey and preparation of as constructed drawings of final constructed slopes, landforms and water drainage structures; and
- Inspection to record the progression of the intended landform.

7.4 RQAP – growth medium development

- Registers of topsoil and/or soil substitute stockpiles including management records (such as stripping/stockpiling dates, weed control, inoculation with microbes, etc.)
- Records of implementation of erosion and sediment controls in accordance with Managing Urban Stormwater: Soils and Construction Volume 2E, Mines and Quarries (DECC 2008b)
- Soil testing results to confirm appropriate soil geochemical parameters for plant establishment; and
- Records of soil replacement depths and methodologies.

7.5 RQAP – ecosystem and land use establishment

Records of revegetation activities undertaken including:

- Date of revegetation actions;
- 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 for use in rehabilitation
- Regular site inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation
- Rehabilitation monitoring in accordance with Chapter 8 of this plan
- Regular inspections to identify potential weed and feral animal infestations; and
- Documentation of all weed management and eradication programs and follow-up inspections.

7.6 RQAP – ecosystem and land use development

- Rehabilitation monitoring in accordance with Chapter 8 to monitor the success of rehabilitation
- Regular site inspections of rehabilitated areas to allow early identification of any emerging threats to rehabilitation
- Regular inspections to identify potential weed infestations; and
- Documentation of all weed management and eradication programs and follow-up inspections.

8. Rehabilitation monitoring program

8.1 Analogue site baseline monitoring

Two analogue sites have been identified, representing the range of final land use, vegetation community and management conditions proposed at the Sulcor mine. Location and details of all analogue sites are presented in Table 13 and Table 14.

Table 13: Analogue site 1

Site	**Analogue site 1 (AS1)** 
Coordinates	56 J 0291906 : 6583329
Ecosystem Type	Grassy Woodland
Canopy / Emergent	Open Woodland (<10% tree cover). Native species such as White Box (Eucalyptus aldens) Black Cypress Pine (Callitris endlicheri), Silver-leaved Ironbark (Eucalyptus melanophloia) and Kurrajong (*Brachychiton populneus*) mixed with introduced species such as Peppercorn Trees (Schinus mole)
Shrub / Understory Layer	Minimal native shrub layer. Primarily tall introduced species such as fleabane and vervain. These are considered weeds within pasture lands and should be controlled as part of the weed management program.
Ground / Herb Layer	100% covered with mixed native and introduced species, consistent with grazing pastoral land. Species not defined.
Fallen timber (Coarse woody debris)	Very low – Occasional thin (5-10mm diameter) sticks and rare medium (10-50mm diameter) sticks

Landform	Very gentle slopes, often less than 5%. Steeper slopes toward the base of the hill where tree density increases, between 5% and 15%. Undulating hills and long convex to simple side slopes.
Soil Conditions	Soils were not surveyed

Table 14: Analogue site 2

Site	**Analogue site 2 (AS2)** 
Coordinates	56 J 0290901 : 6583406
Ecosystem Type	Woodland
Canopy / Emergent	Woodland (10-30%) cover. Native species such as White Box (*Eucalyptus aldens*), Yellow Box (*Eucalyptus melliodora*) Black Cypress Pine (*Callitris endlicheri*), Silver-leaved Ironbark (*Eucalyptus melanophloia*), numerous wattles (*Acacia sp.*) and Rough-barked apple (*Angophora floribunda*) mixed with introduced species such as Peppercorn Trees (*Schinus molle*). Canopy cover tended to be clustered close together except for larger gum trees and Angophora.
Shrub / Understory Layer	Sparse shrub layer mainly in rocky areas. Includes Sticky Hop-bush (*Dodonaea viscosa subsp. Angustifolia*), Native olive (*Notolea microcarpa*) and African Boxthorn (*Lycium ferocissimum*).
Ground / Herb Layer	Ground layer heavily weed impacted with Milk Thistle (*Silybum marianum*) and Fleabane (*Conyza subspecies*). Introduced Coolatai grass is widespread. Some native tussock grasses and forbs persist in small patches. 5-10% rocky ground cover with limestone.
Fallen timber (Coarse woody debris)	Common – Small, medium, and large sticks, with some large logs / fallen branches
Landform	Gentle slopes between 5 and 10%. Small sections of exposed limestone outcroppings. Higher slopes transition towards 20°, with an increase in tree density. Slope at site is listed as 5%.
Soil Conditions	Soils were not surveyed

8.2 Rehabilitation establishment monitoring

8.2.1 Rapid rehabilitation survey

Graymont has adopted a formalised Rapid Rehabilitation Survey (RRS) process (Appendix B) to monitor rehabilitation performance. The RRS process involves an inspection that will be undertaken routinely within each discrete rehabilitation area. The recommended frequency of survey will vary depending on conditions and stage of completion, but typical frequency is:

- Monthly for the first three months during ecosystem establishment; then
- Quarterly through ecosystem establishment and development phases.

Rehabilitation monitoring using the RRS process will continue until the rehabilitation objectives have been met and are substantially trending towards the completion criteria such that active intervention is no longer required and the area is assessed as stable.

The RRS inspection will record key details of rehabilitation progress, including identification of any emerging risks, activation of triggers for mitigation controls, and noting any corrective actions that may be required. Any identified deficiencies or failures shall be noted and follow-up actions identified. Success factors will be noted for future reference and to assist in continuing improvement. Guidance on the key rehabilitation risks, and response actions is provided in the Rehabilitation Risk Assessment (RRA) (Chapter 3) and Trigger Action Response Plan (TARP) (Appendix C).

Details to be recorded during the rapid rehabilitation survey include:

- Area inspected
- Date and time of inspection
- Person undertaking the inspection
- Photographic record
- Surface water drainage. Note factors including:
    - Upslope stormwater diversion/management
    - Sheet flow stability
    - Management of concentrated flows including berms and batter drains
    - Stability and adequacy of discharge control and discharge locations
- Soil surface cover and erosion risk:
    - Ground cover %
    - Presence and severity of sheet, rill and gully erosion
- Assess vegetation cover, health, abundance, type and structure (qualitative assessment only, not full floristic survey)
- Assess presence of weeds, focus on key weed types; and
- Record specific repair/maintenance actions, with timelines and responsibilities for completion. Include an audit process to follow up and close out corrective actions.

8.2.2 Flora and fauna survey

Graymont will engage a suitably qualified person to undertake a targeted flora and fauna survey of rehabilitation areas to assess progress towards achieving the completion criteria. The aims of the vegetation survey are:

- Provide a detailed floristic record of analogue sites and rehabilitation areas
- Describe fauna habitat features and opportunistic presence of any native or introduced fauna
- Assess vegetation cover, health, diversity, abundance, structure
- Assess revegetation success and succession towards the target vegetation community and dominant species; and
- Recommend mitigation or improvement works where required, such as supplementary planting, weed control, soil amelioration and erosion control.

The frequency of these surveys would be annually initially (ecosystem development stage), but may reduce over time as the rehabilitated landscape becomes more mature (ecosystem sustainability phase).

Vegetation condition plots

Biometric plots with dimensions 20m x 20m will be established within each rehabilitation management units and permanently marked using star pickets or similar. A minimum of one plot to be established per management unit.

Data will be collected within each 20 x 20 m permanently marked monitoring plot including:

- A list of all visible vascular plant species (to assess recruitment through comparison with the seeding mix species with the total number of native species recruited based on the sum of plot data within each management area)
- A list of species showing evidence of flowering and seed set (to assess reproductively mature flowering or seeding with the total number of reproductive species based on the sum of plot data within each management area)
- A list of species with seedlings and saplings (to assess regeneration with the total number of native species regenerating based on the sum of plot data within each management area)
- An assessment of the cover – abundance of priority weeds (to assess weed management success based on the average of plots data per management area). Cover and abundance to be measured as:
    - Percentage cover (1-5%, then increments of 5% thereafter); and
    - Approximate abundance (density) of each individual species in intervals of 1-10, 20, 50, 100, 500, 1000, 2000 etc.

Ground condition - transects

Percentage ground cover shall be assessed along a 50m transect attached to each biometric plot, using a point intercept method with cover for all ground cover (vegetation, litter, bare soil, rock, cryptogram, woody debris) recorded at intervals of 0.5 m (100 points). The number of intercepts per ground cover type provides an estimate of % cover. The completion criteria should be assessed on the average of all transects within each management area.

The presence of erosion features shall be based on a site walkover across the grade within each management area and the measurement of the depth of any rills or gullies encountered. This would also provide an opportunity to provide a general appraisal of groundcover across the site.

8.2.3 Record keeping

Good record keeping will assist Graymont Sulcor to track rehabilitation planning and progress and improve success. Graymont Sulcor will maintain the following rehabilitation records:

- Rehabilitation Management Plan (RMP) (this document). The RMP will be reviewed and updated as necessary through the course of mine operations and closure planning and in accordance with Clause 11 of Schedule 8A to the Mining Regulation 2016
- Rehabilitation Risk Assessment. Maintained and updated in accordance with the RRA provided in Chapter 3 and Clause 7 of Schedule 8A to the Mining Regulation 2016
- Annual Rehabilitation Report and Forward Program. Provided annually to the Secretary and prepared in accordance with and Clauses 9 and 13 of Schedule 8A to the Mining Regulation 2016
- Register of soil materials for use in rehabilitation. The register will identify material type, locations and quantity
- Rapid Rehabilitation Survey Results, included as part of a Rehabilitation Register; and
- Rehabilitation Register to record rehabilitation activity and monitoring. This will detail the current rehabilitation status and outline in detail the rehabilitation methodologies undertaken (including landform preparation, drainage goals, growth media development, surface preparation techniques, and revegetation processes, and any follow up corrective actions). The register shall highlight success factors and lessons learned from previous reviews to assist future rehab planning and improve outcomes. The register would include quality assurance records such as as-built drawings. A photographic log would be kept as part of the rehabilitation register.

8.3 Measuring performance against rehabilitation objectives and rehabilitation completion criteria

Routine inspections as described in Chapter 8 will be used to review progress against the rehabilitation objectives and completion criteria for each rehabilitation domain. A closure checklist will be developed for future inspections targeted at assessing progress against the completion criteria.

9. Rehabilitation research, modelling and trials

9.1 Current rehabilitation research, modelling and trials

There are no rehabilitation trials currently being undertaken.

9.2 Future rehabilitation research, modelling and trials

Very little active rehabilitation of land disturbed by mining has been undertaken in the past at Sulcor. Consequently, there is limited information available on direct implementation of different rehabilitation techniques and their performance at the site. With rehabilitation of the overburden and waste dump scheduled to commence there is a good opportunity to trial different techniques, assess performance and use these learnings in planning future rehabilitation.

Future rehabilitation trails will focus on different vegetation techniques on overburden emplacement areas to achieve the desired Agricultural – Grazing final land use.

Aspects of rehabilitation that will be subject to trials and monitoring include:

Plant selection:

- Trialling different cover crop applications and various native and improved pasture species, in consultation with an agronomist; and
- Incorporating native trees and shrubs at low density to improve habitat value, and observing performance of different species and planting/maintenance techniques.

Timing:

- The timing of seed sowing can profoundly influence seedling emergence. Seeding should be undertaken optimally immediately following surface preparation before a surface crust forms; and
- Sowing during different seasons and under different climatic conditions.

Seeding technique:

- Use of alternative vegetation establishment techniques, including seeding with conventional farm equipment, hydromulching and tubestock planting; and
- Methods for supplementary planting as required.

Regular monitoring of rehabilitation success will be critical to ensure that lessons learned are transferred forward to future rehabilitation works.

10. Intervention and adaptive management

The site aims to balance future learning and improve understanding by implementing Adaptive Resource Management (ARM) strategies. The intent over time is to develop a structured set of processes that can be applied repeatedly to assist the site in making decisions about the uncertainty of rehabilitation outcomes.

This process will be assisted by structured rehabilitation monitoring and record keeping including through the use of a rehabilitation register, rapid rehabilitation surveys, and assessing rehabilitation performance against the rehabilitation objectives and completion criteria outlined in Chapter 4 of this document.

The monitoring program will:

- Compare results against rehabilitation objectives and targets
- Identify possible trends and continuous improvement
- Link to records of rehabilitation to determine causes and explain results
- Assess effectiveness of environmental controls implemented
- Where required, identify modifications required for the monitoring program, rehabilitation practices or areas requiring research
- Compare flora species present against original seed mix and/or reference sites and/ or RVC
- Assess vegetation health; and
- Assess vegetation structure (e.g. upper, mid and lower storey).

In the event that rehabilitation failure occurs, further investigation to establish a cause and appropriate remediation strategy(s) will be undertaken. Issues to include the following:

- Nutrient availability
- pH, salinity and metal toxicity
- Shallow root depth
- Other soil limitations
- Insect attack
- Lack of N-fixing legumes
- Lack of organisms involved in litter breakdown (e.g. fungal fruiting bodies) and nutrient cycling (e.g. puff balls)
- Excessive grazing
- Predation
- Evidence of drought effects or storm damage
- Poor soil preparation; and
- Weed competition.

A Trigger Action Response Plan (TARP) has been developed to identify a range of triggers for a number of key rehabilitation activities and to provide responses (refer to Appendix C). The trigger values reflect a trend or change which may affect rehabilitation outcomes and the ability to meet completion criteria for successful rehabilitation.

11. Review, revision and implementation

This Rehabilitation Management Plan (RMP) will be reviewed annually during the preparation of the Annual Rehabilitation Report.

Prior to rehabilitation works commencing on the site, this document will be reviewed to ensure that works are consistent with the RMP and within current approvals. Where works are not consistent, a discussion will take place with the Resource Regulator to determine if an amendment or new RMP is required.

The Operations Manager for Graymont (NSW) Pty Ltd Australia's Sulcor site is responsible for implementing the RMP.

In addition to the above, the RMP must be amended in accordance with Schedule 8A of the Mining Regulation 2016, as follows:

> ***11 Amendment of rehabilitation management plans***
> *The holder of a mining lease must amend the rehabilitation management plan for the mining lease as follows—*
> *a) to substitute the proposed version of a rehabilitation outcome document with the version approved by the Secretary—within 30 days after the document is approved,*
> *b) as a consequence of an amendment made under clause 14 to a rehabilitation outcome document—within 30 days after the amendment is made,*
> *c) to reflect any changes to the risk control measures in the prepared plan that are identified in a rehabilitation risk assessment—as soon as practicable after the rehabilitation risk assessment is conducted, whenever given a written direction to do so by the Secretary—in accordance with the direction.*

Rehabilitation Objectives and Completion Criteria

Appendix A

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Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Infrastructure area	A1	Land and water contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	• Wastes and visible indicators of contamination; and • Soils (and where required water) tested and confirmed free of contamination and fit for final land use in accordance with applicable guidelines including the National Environment Protection (Assessment of Site Contamination) Measure (1999)	No visible signs of contamination. Waste materials removed Contamination assessments confirm site is fit for final land use and does not present an unacceptable ongoing contamination risk.	Land contamination assessment Validation reports
Native ecosystem	Infrastructure area	A1	Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any unacceptable hazards or constraints for intended final land use.	Visual – capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modeling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use. For example: • Capping depth – X metres • Capping material type • Capillary breaks • Seepage control. Groundwater and surface monitoring verify capping function e.g. ‘store and release’ and design performance permeability/seepage. Groundwater and surface water monitoring verify adequate containment of waste materials and seepage/leachate is not contributing to land/groundwater contamination.	Photos, rehabilitation monitoring reports, as-constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports. The structural integrity of the infrastructure and capping has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and water material adequately contained.
Native ecosystem	Infrastructure area	A1	Landform stability	The final landform is stable for the long-term and does not present an unacceptable risk of environmental harm or an unacceptable safety risk to the public/stock/native fauna.	Indicators of landform suitability include: • Slope gradient and length • Landforms shape • Indicators of dispersive soil • Soil surface condition • Indicators of erosion including mass movement • Drainage condition • Compacted hardstands are ripped and rehabilitated • Drainage is stable with adequate capacity to manage flows, lined where required and performing as designed • Retained dams have suitably sized spillways • Run-on water diverted around voids and rehabilitation areas as required to aid stability	• Slopes regraded to≤ 18 degrees • Landform blends with surrounding landscape • Exchangeable Sodium Percentage (ESP) ≤6% for topsoil materials • Absence of gullies >300mm wide or deep or gullies stable • Absence of tunnel erosion intake or outlets points • Landform shaped to maximise sheet flow with minimal concentration of flows. • Drains are performing under a range of climatic scenarios and are free of appreciable erosion • Landforms are safe and stable	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.
Native ecosystem	Infrastructure area	A1	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire mitigation measures based on advice from the NSW Rural Fire Service have been implemented as necessary including managing fuel loads, maintaining fire-breaks and fire-fighting access documented in a Bushfire Management Plan.	Bushfire controls implemented.	Bushfire management plan Acknowledgement of RFS.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Infrastructure area	A1	Water quality	Water quality is compatible with the final land use and does not pose a threat of environmental harm	Water quality indicators include: • No evidence of ongoing water quality impacts from mining • Water quality fit for stock and domestic use	Water quality analysed and proven fit for stock and domestic use. Water quality discharged from rehabilitated mining operation meets specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Water quality results
Native ecosystem	Infrastructure area	A1	Groundwater	Groundwater quality at the mine site is similar to background water quality and does not pose a threat of environmental harm	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operation meet specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Independent hydrological assessment report
Native ecosystem	Infrastructure area	A1	Groundwater	Impacts to groundwater regime are localised and do not pose a threat of environmental harm	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Groundwater regime assessed to not pose threat of environmental harm.	Water quality monitoring reports. Environment Protection Licence relinquished by Environment Protection Authority. Independent hydrological assessment report
Native ecosystem	Infrastructure area	A1	Native revegetation	Levels of **ecosystem function** have been established that demonstrate the rehabilitation is self sustainable	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Infrastructure area	A1	Native revegetation	The **vegetation composition** of the rehabilitation contains species that are commensurate with the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area	Native plant species recorded from fixed monitoring plots are characteristic of the target vegetation community	Native plant species are characteristic of the target vegetation community(s) when compared to analogue sites.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Infrastructure area	A1	Native revegetation	The **vegetation structure** of the rehabilitation is similar to that of the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area.	Cover and abundance of plant growth forms recorded from fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data	Cover, abundance and height range of native plant growth forms are characteristic of, or trending towards, the target vegetation community type	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Infrastructure area	A1	Removal of infrastructure	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe.	Removal of infrastructure and services, including the following: • Buildings, processing infrastructure and industrial equipment • Fuel and chemical tanks and drums in accordance with departmental guidelines • Mining roads • Water pumps and pipelines • Ground water piezometers sealed • Hazardous and contaminated materials • Offices/ laboratory, stores and workshops; and • No industrial machinery will be on site after the mining closure.	All built infrastructure including utilities removed. Hazards isolated and secured.	• Statement provided, utility service disconnection record/notification • Decommissioning reports; and • Before and after photos.
Native ecosystem	Infrastructure area	A1	Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe and does not pose an unacceptable risk to the community	• Hardstands and tracks retained in a fit for service condition that is safe and stable; and • Engineering and structural stability reports.	Retained infrastructure is safe, stable and non-polluting. Hazards isolated and secured.	Engineering report/statement and photos.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Water Management Area	A3	Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe and does not pose an unacceptable risk to the community	• Hardstands and tracks retained in a fit for service condition that is safe and stable; and • Engineering and structural stability reports.	Retained infrastructure is safe, stable and non-polluting. Hazards isolated and secured.	Engineering report/statement and photos.
Native ecosystem	Water Management Area	A3	Land and water contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	• Wastes and visible indicators of contamination; and • Soils (and where required water) tested and confirmed free of contamination and fit for final land use in accordance with applicable guidelines including the National Environment Protection (Assessment of Site Contamination) Measure (1999)	No visible signs of contamination. Waste materials removed Contamination assessments confirm site is fit for final land use and does not present an unacceptable ongoing contamination risk.	Land contamination assessment Validation reports
Native ecosystem	Water Management Area	A3	Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any unacceptable hazards or constraints for intended final land use.	Visual – capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modeling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use. For example: • Capping depth – X metres • Capping material type • Capillary breaks • Seepage control. Groundwater and surface monitoring verify capping function e.g. ‘store and release’ and design performance permeability/seepage. Groundwater and surface water monitoring verify adequate containment of waste materials and seepage/leachate is not contributing to land/groundwater contamination.	Photos, rehabilitation monitoring reports, as-constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports. The structural integrity of the infrastructure and capping has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and water material adequately contained.
Native ecosystem	Water Management Area	A3	Landform stability	The final landform is stable for the long-term and does not present an unacceptable risk of environmental harm or an unacceptable safety risk to the public/stock/native fauna.	Indicators of landform suitability include:• Slope gradient and length• Landforms shape • Indicators of dispersive soil• Soil surface condition• Indicators of erosion including mass movement• Drainage condition• Compacted hardstands are ripped and rehabilitated• Drainage is stable with adequate capacity to manage flows, lined where required and performing as designed• Retained dams have suitably sized spillways• Run-on water diverted around voids and rehabilitation areas as required to aid stability	• Slopes regraded to≤ 18 degrees• Landform blends with surrounding landscape• Exchangeable Sodium Percentage (ESP) ≤6% for topsoil materials• Absence of gullies >300mm wide or deep or gullies stable• Absence of tunnel erosion intake or outlets points• Landform shaped to maximise sheet flow with minimal concentration of flows.• Drains are performing under a range of climatic scenarios and are free of appreciable erosion• Landforms are safe and stable	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Water Management Area	A3	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire mitigation measures based on advice from the NSW Rural Fire Service have been implemented as necessary including managing fuel loads, maintaining fire-breaks and fire-fighting access documented in a Bushfire Management Plan.	Bushfire controls implemented.	Bushfire management plan Acknowledgement of RFS.
Native ecosystem	Water Management Area	A3	Water quality	Water quality is compatible with the final land use and does not pose a threat of environmental harm	Water quality indicators include: • No evidence of ongoing water quality impacts from mining • Water quality fit for stock and domestic use	Water quality analysed and proven fit for stock and domestic use. Water quality discharged from rehabilitated mining operation meets specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Water quality results
Native ecosystem	Water Management Area	A3	Water approvals	Structures that take or hold water are licensed if required subject to relevant legislation (e.g. Water Management Act 2000) and water sharing rules	• Investigation of basic water rights and obligations under applicable water legislation; and • Advice from Government Agency.	Water license and applicable volumetric entitlement held where required.	Water license investigation.
Native ecosystem	Water Management Area	A3	Groundwater	Groundwater quality at the mine site is similar to background water quality and does not pose a threat of environmental harm	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operation meet specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Independent hydrological assessment report
Native ecosystem	Water Management Area	A3	Groundwater	Impacts to groundwater regime are localised and do not pose a threat of environmental harm	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Groundwater regime assessed to not pose threat of environmental harm.	Water quality monitoring reports. Environment Protection Licence relinquished by Environment Protection Authority. Independent hydrological assessment report
Native ecosystem	Water Management Area	A3	Native revegetation	Levels of **ecosystem function** have been established that demonstrate the rehabilitation is self sustainable	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Water Management Area	A3	Native revegetation	The **vegetation composition** of the rehabilitation contains species that are commensurate with the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area	Native plant species recorded from fixed monitoring plots are characteristic of the target vegetation community	Native plant species are characteristic of the target vegetation community(s) when compared to analogue sites.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Water Management Area	A3	Native revegetation	The **vegetation structure** of the rehabilitation is similar to that of the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area.	Cover and abundance of plant growth forms recorded from fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data	Cover, abundance and height range of native plant growth forms are characteristic of, or trending towards, the target vegetation community type	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Overburden emplacement area	A4	Removal of infrastructure	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe.	Removal of infrastructure and services, including the following: • Buildings, processing infrastructure and industrial equipment • Fuel and chemical tanks and drums in accordance with departmental guidelines • Mining roads • Water pumps and pipelines • Ground water piezometers sealed • Hazardous and contaminated materials • Offices/ laboratory, stores and workshops; and • No industrial machinery will be on site after the mining closure.	All built infrastructure including utilities removed. Hazards isolated and secured.	• Statement provided, utility service disconnection record/notification • Decommissioning reports; and • Before and after photos.
Native ecosystem	Overburden emplacement area	A4	Retention of infrastructure	All infrastructure that is to remain as part of the final land use is safe and does not pose an unacceptable risk to the community	• Hardstands and tracks retained in a fit for service condition that is safe and stable; and • Engineering and structural stability reports.	Retained infrastructure is safe, stable and non-polluting.Hazards isolated and secured.	Engineering report/statement and photos.
Native ecosystem	Overburden emplacement area	A4	Land and water contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	• Wastes and visible indicators of contamination; and • Soils (and where required water) tested and confirmed free of contamination and fit for final land use in accordance with applicable guidelines including the National Environment Protection (Assessment of Site Contamination) Measure (1999)	No visible signs of contamination. Waste materials removed Contamination assessments confirm site is fit for final land use and does not present an unacceptable ongoing contamination risk.	Land contamination assessment Validation reports
Native ecosystem	Overburden emplacement area	A4	Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any unacceptable hazards or constraints for intended final land use.	Visual – capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modeling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use. For example: • Capping depth – X metres • Capping material type • Capillary breaks • Seepage control. Groundwater and surface monitoring verify capping function e.g. ‘store and release’ and design performance permeability/seepage. Groundwater and surface water monitoring verify adequate containment of waste materials and seepage/leachate is not contributing to land/groundwater contamination.	Photos, rehabilitation monitoring reports, as-constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports. The structural integrity of the infrastructure and capping has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and water material adequately contained.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Overburden emplacement area	A4	Landform stability	The final landform is stable for the long-term and does not present an unacceptable risk of environmental harm or an unacceptable safety risk to the public/stock/native fauna.	Indicators of landform suitability include: • Slope gradient and length • Landforms shape • Indicators of dispersive soil • Soil surface condition • Indicators of erosion including mass movement • Drainage condition • Compacted hardstands are ripped and rehabilitated • Drainage is stable with adequate capacity to manage flows, lined where required and performing as designed • Retained dams have suitably sized spillways • Run-on water diverted around voids and rehabilitation areas as required to aid stability	• Slopes regraded to≤ 18 degrees • Landform blends with surrounding landscape • Exchangeable Sodium Percentage (ESP) ≤6% for topsoil materials • Absence of gullies >300mm wide or deep or gullies stable • Absence of tunnel erosion intake or outlets points • Landform shaped to maximise sheet flow with minimal concentration of flows. • Drains are performing under a range of climatic scenarios and are free of appreciable erosion • Landforms are safe and stable	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.
Native ecosystem	Overburden emplacement area	A4	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire mitigation measures based on advice from the NSW Rural Fire Service have been implemented as necessary including managing fuel loads, maintaining fire-breaks and fire-fighting access documented in a Bushfire Management Plan.	Bushfire controls implemented.	Bushfire management plan Acknowledgement of RFS.
Native ecosystem	Overburden emplacement area	A4	Water quality	Water quality is compatible with the final land use and does not pose a threat of environmental harm	Water quality indicators include: • No evidence of ongoing water quality impacts from mining • Water quality fit for stock and domestic use	Water quality analysed and proven fit for stock and domestic use. Water quality discharged from rehabilitated mining operation meets specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Water quality results
Native ecosystem	Overburden emplacement area	A4	Groundwater	Groundwater quality at the mine site is similar to background water quality and does not pose a threat of environmental harm	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operation meet specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Independent hydrological assessment report
Native ecosystem	Overburden emplacement area	A4	Groundwater	Impacts to groundwater regime are localised and do not pose a threat of environmental harm	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Groundwater regime assessed to not pose threat of environmental harm.	Water quality monitoring reports. Environment Protection Licence relinquished by Environment Protection Authority. Independent hydrological assessment report
Native ecosystem	Overburden emplacement area	A4	Native revegetation	Levels of **ecosystem function** have been established that demonstrate the rehabilitation is self sustainable	Indicators of nutrient cycling are suitable for sustaining the target vegetation community	Litter cover is within 10th-90th percentile variation range of reference sites/data	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Native ecosystem	Overburden emplacement area	A4	Native revegetation	The **vegetation composition** of the rehabilitation contains species that are commensurate with the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area	Native plant species recorded from fixed monitoring plots are characteristic of the target vegetation community	Native plant species are characteristic of the target vegetation community(s) when compared to analogue sites.	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Native ecosystem	Overburden emplacement area	A4	Native revegetation	The **vegetation structure** of the rehabilitation is similar to that of the native vegetation community White Box-Yellow Box-Blakely's Red Gum Grassy Woodland found in the local area.	Cover and abundance of plant growth forms recorded from fixed monitoring plots are characteristic of the target vegetation community, or an ongoing trend toward becoming characteristic is evident from the monitoring data	Cover, abundance and height range of native plant growth forms are characteristic of, or trending towards, the target vegetation community type	Before and after photos, rehabilitation monitoring reports, independent ecological reports (where required) that validate rehabilitation completion criteria have been met.
Final void	Active mining area	J5	Land and water contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.	• Wastes and visible indicators of contamination; and • Soils (and where required water) tested and confirmed free of contamination and fit for final land use in accordance with applicable guidelines including the National Environment Protection (Assessment of Site Contamination) Measure (1999)	No visible signs of contamination. Waste materials removed Contamination assessments confirm site is fit for final land use and does not present an unacceptable ongoing contamination risk.	Land contamination assessment Validation reports
Final void	Active mining area	J5	Management of waste and process materials	Residual waste materials stored on site will be appropriately contained / encapsulated so it does not pose any unacceptable hazards or constraints for intended final land use.	Visual – capping material placement, type across emplacement Visual – indication of capping performance on final landform – vegetation health Visual – emplacement seepage and other indicators of groundwater issues – wet spots etc. Measured - survey of emplacement capping to verify construction and to monitor settlement. Quality assurance records for the construction of the emplacement material including (where relevant) capping material, liner system, seepage control etc Measured- surface and groundwater levels to verify water balance modeling and capping function Measured – contamination levels in surface and groundwater surrounding emplacement for contaminants of concern associated with waste material emplaced.	Visual – verification that capping, type and placement consistent with design Visual – no signs of compromised capping performance indicated by vegetation health – such as tree death (deeper root systems) Visual – no areas of unexpected seepage Survey verifies that capping placement consistent with design and settlement and/or material loss is within predicted limits and will not compromise final landform drainage via differential settlement. Quality assurance records verify capping constructed and in accordance with design specifications relevant to site risks and target final land use. For example: • Capping depth – X metres • Capping material type • Capillary breaks • Seepage control. Groundwater and surface monitoring verify capping function e.g. 'store and release' and design performance permeability/seepage. Groundwater and surface water monitoring verify adequate containment of waste materials and seepage/leachate is not contributing to land/groundwater contamination.	Photos, rehabilitation monitoring reports, as-constructed surveys, quality assurance records for construction, erosion surveys, independent geotechnical reports (where required), groundwater/surface water monitoring reports. The structural integrity of the infrastructure and capping has been inspected by a suitably qualified engineer and determined to be suitable and safe as part of the intended final land use and water material adequately contained.

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Final void	Active mining area	J5	Landform stability	The final landform is stable for the long-term and does not present an unacceptable risk of environmental harm or an unacceptable safety risk to the public/stock/native fauna.	Indicators of landform suitability include: • Slope gradient and length • Landforms shape • Indicators of dispersive soil • Soil surface condition • Indicators of erosion including mass movement • Drainage condition • Compacted hardstands are ripped and rehabilitated • Drainage is stable with adequate capacity to manage flows, lined where required and performing as designed • Retained dams have suitably sized spillways • Run-on water diverted around voids and rehabilitation areas as required to aid stability	• Slopes regraded to≤ 18 degrees • Landform blends with surrounding landscape • Exchangeable Sodium Percentage (ESP) ≤6% for topsoil materials • Absence of gullies >300mm wide or deep or gullies stable • Absence of tunnel erosion intake or outlets points • Landform shaped to maximise sheet flow with minimal concentration of flows. • Drains are performing under a range of climatic scenarios and are free of appreciable erosion • Landforms are safe and stable	Before and after photos, rehabilitation monitoring reports, as-constructed surveys, erosion surveys, independent geotechnical reports (where required) and or erosion modelling reports (where required) that indicate long-term stability of rehabilitated landform.
Final void	Active mining area	J5	Bushfire	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.	Bushfire mitigation measures based on advice from the NSW Rural Fire Service have been implemented as necessary including managing fuel loads, maintaining fire-breaks and fire-fighting access documented in a Bushfire Management Plan.	Bushfire controls implemented.	Bushfire management plan Acknowledgement of RFS.
Final void	Active mining area	J5	Water quality	Water quality is compatible with the final land use and does not pose a threat of environmental harm	Water quality indicators include:• No evidence of ongoing water quality impacts from mining• Water quality fit for stock and domestic use	Water quality analysed and proven fit for stock and domestic use. Water quality discharged from rehabilitated mining operation meets specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Water quality results
Final void	Active mining area	J5	Water approvals	Structures that take or hold water are licensed if required subject to relevant legislation (e.g. Water Management Act 2000) and water sharing rules	• Investigation of basic water rights and obligations under applicable water legislation; and • Advice from Government Agency.	Water license and applicable volumetric entitlement held where required.	Water license investigation.
Final void	Active mining area	J5	Groundwater	Groundwater quality at the mine site is similar to background water quality and does not pose a threat of environmental harm	Water quality parameters selected from Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 and or Environment Protection Licence (further guidance available on the NSW Environment Protection Authority website).	Water quality discharged from rehabilitated mining operation meet specifications in Environment Protection Licence or assessed to not pose threat of environmental harm.	Independent hydrological assessment report
Final void	Active mining area	J5	Groundwater	Impacts to groundwater regime are localised and do not pose a threat of environmental harm	Groundwater quality both on and off a mining lease represent an acceptable level of change from a defined reference condition	Groundwater regime assessed to not pose threat of environmental harm.	Water quality monitoring reports. Environment Protection Licence relinquished by Environment Protection Authority. Independent hydrological assessment report

Final Land Use Domain	Mining domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives	Indicator	Rehabilitation Completion Criteria	Justification / Validation Methods
Final void	Active mining area	J5	Removal of infrastructure	All infrastructure that is not to be used as part of the final land use is removed to ensure the site is safe.	Removal of infrastructure and services, including the following: • Buildings, processing infrastructure and industrial equipment • Fuel and chemical tanks and drums in accordance with departmental guidelines • Mining roads • Water pumps and pipelines • Ground water piezometers sealed • Hazardous and contaminated materials • Offices/ laboratory, stores and workshops; and • No industrial machinery will be on site after the mining closure.	All built infrastructure including utilities removed. Hazards isolated and secured.	• Statement provided, utility service disconnection record/notification • Decommissioning reports; and • Before and after photos.
Final void	Active mining area	J5	Agricultural revegetation	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use, being agricultural (grazing).	Rapid rehabilitation survey indicates soil, landform and vegetation systems tending towards analogue sites including for the following indicators: • Vegetation cover (eg type, health, abundance, structure) • Weeds (presence, type, severity) • Surface water and drainage (diversion, stability, lining integrity, discharge stability) • Soil physical and chemical characteristics are suitable for the final land use • Erosion risks (soil exposure %, presence, type and severity of erosion e.g. sheet, rill and gully); and • Land and Soil Capability or Agricultural Land Classification criteria Grassland and pasture species mix is sown at the specified sowing rate as recommended by agronomist or rehabilitation specialist. Commodity data (e.g. stocking rates, livestock weights, pasture composition	The re-established topsoil / subsoil substrate is capable of supporting the targeted pasture regime on a sustained basis. Pasture establishment is consistent with the range of species utilised within the region. Pasture establishment is in good health and provides adequate cover.	Rehabilitation monitoring reports, independent soil reports, environmental monitoring records, independent agronomist reports.
Final void	Active mining area	J5	Agricultural revegetation	Landuse capability is capable of supporting grazing - Class VII.	Routine Soil Test Resilience demonstrated by the effects of drought and fire on composition, structure and other function attributes of pasture and cropping lands	Land and Soil Capability Class VI criteria met. Appropriate and reliable access to water for livestock. Appropriate animal refuge areas for livestock (e.g. wooded/treed areas) during extreme weather conditions. Resilience to drought and fire.	Rehabilitation monitoring reports, independent soil reports, environmental monitoring records, independent agronomist reports.

Rapid Rehabilitation Survey Form

Appendix B

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Graymont Sulcor Rapid Rehabilitation Survey Form

Rehab Site ID:	**Rehab stage:**
Date/time of inspection:	**Inspection by:**

Description of status	Existing or emerging risks	Remedial actions, timeframe and responsibility
Vegetation cover (eg type, health, abundance, structure):		
Weeds (presence, type, severity):		
Surface water and drainage (diversion, stability, lining integrity, discharge stability):		
Erosion (soil exposure %, presence, type and severity of erosion (eg sheet, rill and gully):		
Additional notes / key issues / progress since last inspection:		
TARP triggered?		

TARP Item	Risk Level	Recommended Mitigation

Photo record:	

Trigger Action Response Plan (TARP)

Appendix C

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Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
Changes in legislation or approval conditions requiring a review of rehabilitation criteria or change to land use or ecological community.	New legislation or approval conditions implemented, but no impact on current closure land use or criteria.	New legislation or approval conditions implemented that requires changes to land-use or closure criteria e.g. slope gradients or vegetation community. Required changes are such that they can be implemented without requiring major redesign work.	New legislation or approval conditions implemented that requires major changes to land- use or closure criteria, requiring major changes to rehabilitation design or processes, as well as impacting on closure costs.	
	Trigger Action Response to above Triggers			
	No actions required except to continue to review any legislation changes that may affect rehabilitation methodology. If best practice is implemented in rehabilitation works, then the risk of legislation changes impacting on planned or implemented rehabilitation will be reduced.	Rehabilitation management plan and closure criteria are to be updated in accordance with updated legislation. Impact on closure costing to be determined. Rehabilitation designs are to be updated as required.	Closure criteria and final land use options are to be reviewed and the rehabilitation processes developed to achieve the required changes, specialist advice may be required. Closure costing and rehabilitation plans and manuals are to be updated.	Triggers for legislation changes will include new approval conditions, updates of mining lease conditions and rehabilitation management plan.
Slope Gradients	Slope gradient ≤ 2% of design gradient	Slope gradient ≤ 4% of design gradient	Slope gradient ≤ 6% of design gradient	Formal survey is undertaken as part of the waste dump inspection process prior to the placement of subsoil and topsoil.
	Trigger Action Response to above Triggers			
	Do nothing, progress rehabilitation works.	Instigate investigation into the cause of the non-	Instigate investigation into cause of the non- conformance. Determine and	

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
		conformance—re-grade slopes and survey.	implement a methodology to return the slope to design gradients.	
Topsoil in rehab domains	Suitable topsoil quality and depth	Insufficient topsoil depth for establishment species	Insufficient suitable growing media	Topsoil testing from stored stockpiles prior to re-spreading.
	Trigger Action Response to above Triggers			
	Proceed with seeding and/or planting	Apply ameliorated subsoil	Test mine spoil for agronomic and erosion parameters. Amend spoil for rehabilitation purposes. Investigate why topsoil and subsoil resources were insufficient.	
Seed Establishment Rate	>75% of seeds germinate	<75% and > 40% of seeds germinate	<40% of seeds germinate	
	Trigger Action Response to above Triggers			
	Check soil moisture and weather forecast & determine if irrigation may be required. Review seed purity and germination certificates.	Visual investigation for potential causes of low establishment rate, including (soil moisture & temperature, ground conditions). Record any findings. Follow up seeding to improve plant densities is to be considered. Undertake spot topsoil and subsoil samples to determine if soil parameters fall within required ranges.	Detailed investigation into cause of poor seed establishment. Investigations may include: Detailed soil sampling program including soil moisture levels, analysis of meteorological conditions, follow seed germination testing with original seed used, germination trials in seed trays using field growth medium. Use an ecology specialist to investigate potential causes.	Measured as number of grass seedlings that have emerged ±2 weeks after expected germination. Establishment rate is determined by counting the number of seedlings in a few (1-3) square meter plots with comparison to sowing density

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
Germination testing	>80% of seeds germinate	65% - 80%of seeds germinate	<40% of seeds germinate	
	Trigger Action Response to above Triggers			
	No action to be taken and germination rate is to be used to determine seeding rate.	Cause of poor germination rate is to be investigated. The investigation is to include growth vigour, as vigour may also be affected. Actions to improve germination using various seed preparation methodologies may be required and the germination trials redone. Seeding rate in kg/ha is to be adjusted to compensate for poor germination. An alternate option is to include other seed which has a higher germination rate if available.	Investigation of flow germination rate to be undertaken. Actions to improve germination using various seed preparation methodologies may be required and the germination trials Seeding rate in kg/ha is to be adjusted to compensate for poor germination. Other seed may need to be sourced.	
Weeds and invader species across the mining lease or within the seed mix	No identified weeds	Suspect weed and/or invader species identified	Weeds and/or invader species identified in seed mix. Infestation of weeds in concentrated areas of the Mining Lease.	
	Trigger Action Response to above Triggers			
	No action to be taken.	Monitoring to continue, treatment and management to occur as per the weed management plan. Seed mix	Seed mix is not to be used on any mine rehabilitation areas. Monitoring frequency to increase, frequency of treatment and management measures to increase	Weeds and invader species will be identified during germination trials. Identification can also be

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
		to be visually screened and additional testing undertaken to confirm if free of weeds.	beyond the normal requirements of the weed management plan.	done by visual inspection of the seed mix prior to use. History and sourcing of the seeds acts as a prompt to investigate the seed mix.
Waste outside the design criteria (shape, height, and volume)	Waste Dump is in accordance with design criteria.	Waste Dump area has reached the design capacity.	Dumping has extended beyond the design criteria (shape, height, and volume).	
	Trigger Action Response to above Triggers			
	No action to be taken.	Discuss situation with mine planning and put procedures in place to prevent toe of dump extending beyond the design criteria. Design criteria can be reviewed and amended if the dump rehabilitation design is feasible within the amended toe constraints.	Dumping should be put on hold until the situation has been reviewed and a workable rehabilitation plan implemented for the change in dumping strategy. If no alternative design plan is feasible then all dumping should be halted. An investigation into the cause of the change of the dumping plan is to be investigated with corrective actions taken.	Identification of design exceeds is through: Visual inspection, from mining and survey reports, comparison of aerial photography with surface elevations to original design criteria.
Rehabilitation Monitoring				
Geotechnical instability	No identified signs of instability or mass movement.	Signs of minor settlement (drop in elevation), appearance of hairline ground cracks.	Signs of significant movement: Appearance of enlarged ground cracks (+2mm wide), visible vertical or horizontal movement	
	Trigger Action Response to above Triggers			
	No action to be taken.	Depth and extent of cracking to be recorded and 3 monthly	Geotechnical investigation of the ground movement is to be undertaken together	Ground movement will be identified as part of infield

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
		monitoring undertaken. Survey stations for movement may be required. Minor settlement can be infilled with topsoil and reseeded if required.	with an assessment of damage to rehabilitation landform or drainage structure.	rehabilitation monitoring (ecological or annual walk around, remote sensing initiative to identify erosion would also assist in the identification of ground movement)
Erosion and loss of topsoil/growth medium	No rill erosion evident	Rills and inter rill erosion present	Gullies and tunnels present	
	Trigger Action Response to above Triggers			
	No action is to be taken other than continued monitoring following rainfall.	Erosion to be treated. Surface hydrology reviewed and landform is to be reviewed, in conjunction with surface vegetation and historic weather. Application of organic cover or soil polymer maybe considered.	Full investigation is to be undertaken with a review of all design parameters with particularly emphasis on overland from the top of the dump, drainage design and amelioration of dispersive spoil and soils. Expert advice on remediation to be sought.	Visual assessment for rill, inter rill, gully and tunnel erosion inlet and outlet points as part of Rapid Rehabilitation Survey
Vegetation Predation	Minimal amount of vegetation predation by browsers and grazers (kangaroos, rabbits, livestock, insects), no effect on plant growth.	Pest animal species presence and density increased in annual monitoring events.	Significant numbers of pest animals causing widespread damage to rehabilitation	
	Trigger Action Response to above Triggers			

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
	No action to be taken other than continued monitoring.	Consult with Local Land Services NSW to recommend and implement appropriate pest animal control campaign. Implement controls to prevent access depending on the species eating the vegetation.	Consult with Local Land Services NSW to recommend and implement appropriate pest animal control campaign. Engage a suitably qualified specialist to prepare a site management plan and implement recommendations such as augmenting pest animal exclusion fencing and re-vegetation	Identified during Rapid Rehabilitation Survey and walk around monitoring.
Rapid Rehabilitation Survey monitoring shows Vegetation communities have unsatisfactory progress towards achieving the set closure criteria, or there is degradation in the vegetation community function	Vegetation community progression still within expected progression.	Vegetation community progression is not in accordance with expected progression.	Vegetation community progression has started to deteriorate.	
	Trigger Action Response to above Triggers			
	No action to be taken other than continued monitoring.	Progression analysis is to be reviewed with meteorological data and compared with analogue sites. Causes of the poor vegetation progression to be determined and remedial action developed.	Specialist advice is to be sought to determine root cause of deterioration and a remedial action plan developed. Learning's from the process are to be fed back into the rehabilitation plan as part of continuous improvement.	Determined by annual rehabilitation monitoring and analysis of monitoring data.
Destructive environmental event (Fire, drought, flood, insect plague)	Minimal effect/damage to vegetation and landform including drainage structures, vegetation able to fully recover without intervention.	Minor damage to ecological plant structures and or landform and stability structures. Minimal remediation required e.g.	Significant damage to ecological plant structures and or landform and stability structures requiring remediation and redesign.	

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
		reseeding or fertilizer application.		
	Trigger Action Response to above Triggers			
	No action to be taken other than continued monitoring.	Remediation action plan to be implemented by site personnel.	Detailed assessment to be undertaken by rehabilitation specialist and remedial action plan developed. Preventative measure to be investigated and any recommendations are to be implemented and the rehabilitation manual updated as required.	Identified as part of post event inspection and monitoring by rehabilitation specialist as required.
Batters and Benches	Batters and benches show no signs of erosion and vegetation layer is self-sustaining and improving over time.	Batters and benches show signs of sediment filling, minor erosion, stressed vegetation covering or minor water ponding.	Batters and benches are filled with sediment, signs of water overtopping or substantial erosion (undercutting, tunnel erosion, riling along bank), or bare vegetation patches.	
	Trigger Action Response to above Triggers			
	No action to be taken other than continued monitoring.	Monitoring frequency is to be increased, and observations undertaken during rainfall events that cause runoff. Local repair work is to be undertaken as needed. Diversion banks or contour drains to be removed and sheet flow conditions re-established if 70% soil surface	Investigation into the cause of the diversion bank failure is to be initiated, and the design parameters reviewed, with learning fed back into the rehabilitation processes. Investigation initiated by erosion specialist if ground movement (slumping, settlement) is suspected. Grade survey of the diversion bank may be required if drainage is an issue. After initial causes have been identified a remediation plan is to be implemented.	Monitoring is primarily undertaken during informal and formal rehabilitation inspections (walk around) and monitoring. Site incident reporting and ad- hoc environmental inspections ay also identify issues.

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
		(vegetation) cover exists below diversion bank.	Diversion banks to be removed and sheet flow conditions re-established if 70% soil surface cover (vegetation) exists below diversion bank.	
Slope Drains & Drops structures	Slope drains show no signs of erosion and any geofabrics/membranes or rock lining are in place as constructed with no signs of movement. No signs of water overtopping or undercutting of drain structure.	Slope drains starting to show signs of channel bed erosion, minor undercutting of drain inlets, erosion riling of drain sidewalls, drain outlets show signs of erosion. Topsoil/growth medium shows signs of accelerated erosion and degradation of any vegetation covering.	Severe channel erosion, damage to any geofabric linings or stone lining, overtopping of drain sidewalls, loss of topsoil/growth medium, tunnel erosion under or beside the structure.	Monitoring is primarily undertaken during informal and formal rehabilitation inspections (walk around) and monitoring. Site incident reporting and ad- hoc environmental inspections ay also identify issues.
	Trigger Action Response to above Triggers			
	No action to be taken other than continued monitoring.	Monitoring frequency is to be increased, and observations undertaken during rainfall events causing runoff. Local repair work is to be undertaken as needed. Diversion banks and slope drains to be removed and rehabilitation once 70% vegetative soil surface cover has been achieved and sheet flow conditions can be established.	Investigation into the cause of the failure is to be initiated, and the design parameters reviewed, with learning fed back into the rehabilitation design. Erosion specialist investigation initiated if tunnel erosion is suspected. Grade survey of the diversion bank may be required if drainage is an issue. After initial causes have been identified a remediation plan is to be implemented. Diversion banks and slope drains to be removed and rehabilitation once 70% vegetative soil surface cover has been	

Response to Undesired Changes to Rehabilitation affecting Outcome Criteria, or Operational Activities that may affect Rehabilitation Outcomes				
Rehabilitation or Operational Activity	Green	Amber	Red	**Recommended monitoring / measuring methods**
			achieved and sheet flow conditions can be established.	
Dams and water retained in final void.	Water quality monitoring shows water meets requirements for final land use.	Water quality monitoring shows water quality parameters are outside the requirements for final land use.	Water quality monitoring shows that water quality parameters are continually significantly outside the requirements for final land use.	Water quality monitoring
	Trigger Action Response to above Triggers			
	No action to be taken other than continued monitoring.	Continue monitoring to determine if increased vegetation establishment achieves improved water quality. Treat the dam water.	Investigate removal of dam or alternate water uses. Investigate removal of dam and landform changes to manage surface water as sheet flow conditions if possible. Develop removal and earthworks plan and undertake works. Alternatively investigate alternate water use and criteria if water quality cannot be maintained.	

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Rehabilitation Management Plan (RMP) Sulcor Limestone Mine

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Sydney
Brisbane
Hobart
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Devonport

ref: Sulcor RMP_Rev01_Final/CG/mj