



Rehabilitation Management Plan

Name of Mine	Mallee Quarries Mine
Rehabilitation Management Plan commencement date	1 st July 2022
Rehabilitation Management Plan revision date and Version number	1 st July 2023, Version 1
Mining Lease numbers and expiry dates	ML 1644 (Expiry date 21/10/2031)
Name of Lease Holder	Mallee Quarries Pty Ltd
Date of submission	6-05-23

Abstract

Surface mining to extract gypsum has taken place within this lease boundary for at least 50 years. Any disturbed land by the leaseholder is to be returned to the natural ecosystem, which is low density Mallee scrub, not suitable for grazing. The major risks to rehabilitation onsite are the lack of topsoil present, with gypsum on the surface, and the potential for drought, which is quite common in this area. These risks can be mitigated by importing topsoil or developing a growing medium insitu. While drought cannot be totally mitigated, seed spreading after rain and irrigation trails are proposed.

The process of rehabilitation is straightforward with a haul back method employed with only a small area of active mining open at any time. There is no water infrastructure, waste generated or soil contamination risks. The landform will be formed to generally flat as the gypsum occurs in dunes. The year to year extraction and area disturbed will vary depending on demand.

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1. Part 1 – Introduction

1.1 History of Operations

GM Richardson transferred the mining lease to MEE Quarries in October 2020.

GM Richardson Pty Ltd had held various exploration licences (including No. 6034) and mineral claims (MC 299 and 300) in the area for the past 30 years. Exploration and analysis had been undertaken to determine where the high-grade gypsum exists, which lead to the application and acceptance of a mineral lease.

The lease area has been heavily disturbed since European settlement. This disturbance has included grazing, various mining (now derelict), recreational motorbike riding, rabbit invasion and illegal dumping of rubbish.

1.2 Current development consents, leases and licences

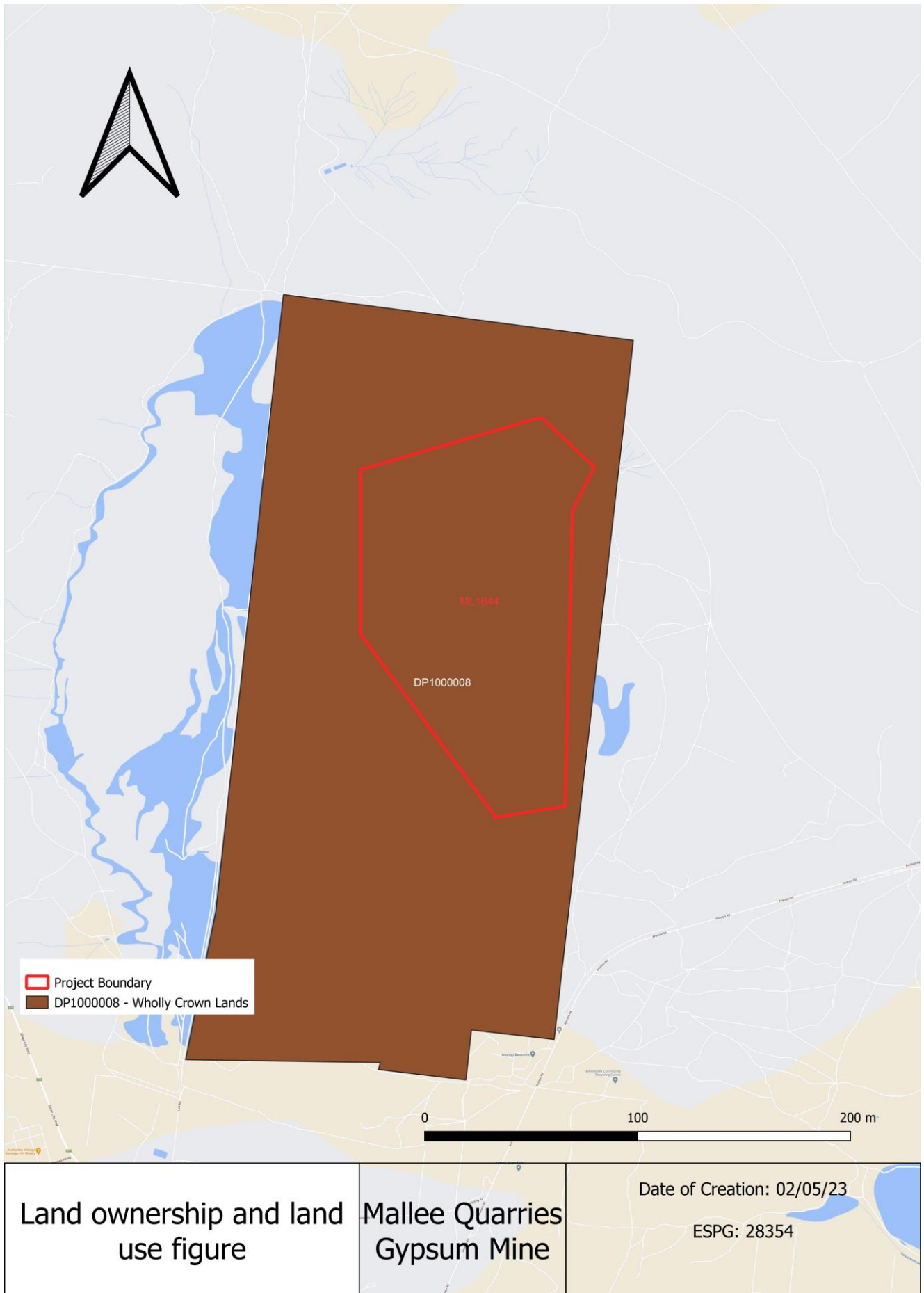
Name	Reference	Grant date	Authority responsible	Renewal/expiry
Development approval	DA08/075	3 July 2009	Wentworth Shire Council	1 July 2011 – does not need renewed
EPA licence	13239	12 May 2010	DECCW	12 May; annual report due; does not need renewed
Mining lease	1644	21 October 2010	NSW DPI	Renewal in 7 year periods commencing from issue date with end of lease in 2031

1.3 Land ownerships and land use

The mining lease is entire enclosed by a parcel of land (Lot 6918 DP 1000008) which is recognised as Vacant Crown Land and licensed (licence no 376369) to the Water Administration Ministerial Corporation.

The current land zoning is listed as Primary Production (RU1) in the Wentworth Shire Council LEP 2011, however due to the nature of the soil and vegetation on site relates to a low carrying capacity, so no grazing occurs.

1.3.1 Land ownership and land use figure



2. Part 2 – Final Land Use

2.1 Regulatory requirement for rehabilitation

Document	Condition	
Mining Lease	2.	Any disturbance resulting from the activities carried out under this mining lease must be rehabilitated to the satisfaction of the Minister.
DA08075	9.	The Environmental Impact Statement and Environmental Management and Rehabilitation Plan forms part of this approval and is to be read in conjunction with the conditions of this approval. Where there is a conflict between the Environmental Impact Statement and Environmental Management and Rehabilitation Plan, the conditions of this approval shall apply.
	15.	<p>Flora and Fauna</p> <p>A site rehabilitation and revegetation plan must be submitted to Wentworth Shire Council before quarrying activities commence at the site. The plan should detail management actions such as exclusion of stock grazing, weed control, and rabbit control. The plan should only use locally native species for revegetation purposes.</p>
	16.	The site rehabilitation and revegetation plan implementation must be commences within 12 months of the commencement of extraction activities at the site.
	17.	Monitoring of site rehabilitation activities must be undertaken by a qualified ecologist to determine the success of the rehabilitation works, and identify any areas where follow-up plantings or other work is required. This monitoring should be undertaken within 12 months of the completion of quarrying activities at the site.
	18.	A report detailing the findings of the monitoring should be submitted to council within three (3) months of the monitoring being undertaken.
EIS 2007	4.3.1	<p>After topsoil is reapplied to worked out areas, the ground is to be lightly ripped (depth 25cm @0.5m centres across the slope to create a roughened surface. The ripping operation must avoid exposing overburden. A rough surface will minimise wind erosion.</p> <p>Revegetation of disturbed areas will occur naturally by careful retention and reuse of the topsoil which will contain appropriate indigenous seed. This method will reduce soil erosion by decreasing the time needed to become stable.</p> <p>The sparse trees surrounding the mining lease area will be retained. The trees may provide some protection from wind erosion and have biodiversity value.</p>
	5.0	<p>Rehabilitation will be progressive throughout the life of the lease. Worked areas will not require leveling as excavation is predominately the removal of topsoil. The site will not be levelled to a perfectly flat surface, as this is not representative of the existing topography. The base of the excavated site will be graded if required. The excavated sites naturally have potential for rapid water penetration; therefore, collection of windblown seeds will enable natural re-growth.</p> <p>The topsoil pushed into windrows prior to excavation will be re-spread over the area to be rehabilitated, which will aid the revegetation of species naturally occurring in the area and will contribute to soil stabilization. The areas to be lightly ripped on contour to minimize wind erosion while avoiding burying the topsoil</p> <p>It is envisaged that the site will be returned to as near as possible its natural condition. Previous experience indicated when the topsoil is replaced, germination of the seed store occurs soon after the next rain.</p>
SRRP 2010		It is proposed to return the area to a similar if not better condition than it is currently in. This includes returning the soil surface to its original form, recolonisation of vegetation and seeding of Atriplex species to assist in developing a vegetative cover to minimise soil erosion.

2.2 Final land use options assessment

The DA does not define the final land use. It instructs that the EIS and SRRP be read in conjunction with the DA. As noted above, the SRRP states 'It is proposed to return the area to a similar if not better condition than it is currently in'.

The lease area has been heavily disturbed since European settlement. This disturbance has included grazing, various mining (now derelict), recreational motorbike riding, rabbit invasion and illegal dumping of rubbish. The current land zoning is listed as Primary Production (RU1) in the Wentworth Shire Council LEP 2011, however due to the nature of the soil and vegetation on site relates to a low carrying capacity, so no grazing occurs.

The land surrounding the lease is not used for any purpose. Due to the extremely low volume and poor quality of topsoil in the area, low rainfall totals and high summer temperatures, growth is slow and sparse. The land cannot support agricultural grazing.

Finally, the EIS states that 'the site will be returned to as near as possible its natural condition'. The final land use should therefore be considered **native ecosystem** as the surrounding land is not used for light grazing (i.e. agricultural grazing) and its natural condition is native (although heavily disturbed) ecosystem.

2.3 Final land use statement

The final land use of any mining area should be native ecosystem as stated in the EIS submitted with the development consent.

2.4 Final land use and mining domains

2.4.1 Final land use domains

The entire site should be restored to:

native ecosystem

2.4.2 Mining domains

Mining Domain	Final land use domain
Infrastructure area	native ecosystem
Active mining area (open cut void)	native ecosystem

3. Part 3 – Rehabilitation risk assessment

A rehabilitation risk assessment was inherited from the previous lease holder, this will be the first update.

Conditions of a mining lease granted under the Mining Act 1992 require the lease holder to conduct a rehabilitation risk assessment and implement measures to eliminate, minimise or mitigate the risks in accordance with the Resources Regulator's Guideline: Rehabilitation risk assessment.

A risk assessment workshop was undertaken on 24 April 2023. The workshop was used to identify the key issues that presented a risk to achieving satisfactory within the lease area. The risk assessment included key MEE.

The risk assessment has been used to inform the preparation of this Plan.

The objectives of the risk assessment were to:

- Identify the risks associated with rehabilitation and closure to achieve the approved post mining land uses;
- Identify knowledge gaps in Whitehaven's current understanding of the risks to rehabilitation;
- Identify the investigations/controls/action plans necessary to effectively mitigate risks and/or realise opportunities and to close any identified knowledge gaps;
- Inform the development of this RMP, to provide a basis to determine additional investigations and/or project works to be undertaken; and
- Provide the framework to satisfy relevant internal and government guidelines, requiring implementation of a risk-based approach to closure.

Rehabilitation risks, controls and proposed controls will regularly be reviewed and revised (as required).

Rehabilitation Risk Assessment

General Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Administrative failures	Insufficient skills and experience of rehabilitation personnel.	Only experienced operators will be engaged to conduct rehabilitation activities.	
	Lack of clearly defined responsibilities.	Responsibilities and roles for rehabilitation will be defined in a landclearing and rehabilitation guideline that is to be developed and used with inductions.	
	Insufficient funding for or prioritization of rehabilitation activities	MEE will ensure that sufficient funds are available to conduct rehabilitation activities. Note, a rehabilitation bond is held over the site and will be reviewed annually for the life of the mine.	
Erosion		Slopes to be reduced.	Slopes to be reduced to a maximum of 3H:1V within the void
		Reduce slope lengths.	Slope Lengths shall not exceed 50 metres before being broken by earth banks or similar for batter slopes of 3H:1V.
		Topsoil stockpile management.	Slopes no greater than 18o (3H:1V). Stockpile height no greater than 2 metres. No stockpiles to be constructed in areas of concentrated flows. See 6.2.1 for further information
Wind Erosion		Dust suppression	Water cart to be engaged during mining, hauling and rehabilitation activities. During adverse conditions: <ul style="list-style-type: none"> • Cease mining or hauling activities in adverse wind conditions: and • Increase water cart frequency.
Bushfire	Harm to rehabilitation areas.	Limit access for deliberately lit fires.	Appropriate fencing is to be repaired and maintained. Locked access gate outside of operating hours.
		Maintain fire breaks.	

Active Mining Phase Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Salvage of Biological Resources	Loss of biological resources	Minimise loss of biological resources through suitable land clearing, salvage and handling practices.	<p>Areas to be land cleared will be clearly marked to ensure only land to be cleared is disturbed.</p> <p>Land clearing is only carried out by experienced staff.</p> <p>Fallen trees are to be salvaged and reused immediately by placing on rehabilitated land. If no suitable rehabilitation areas are available, fallen trees will be stored in windrows for reuse in future rehabilitation.</p> <p>Topsoil material to be stripped will be used immediately or stored in stockpiles no greater than 2 metres in height and be revegetated with temporary grass species or otherwise stabilised as described in the erosion risk controls above.</p> <p>See 6.2.1 for further information</p>
		Substrate inadequate to support revegetation or agricultural land capability (e.g. lack of organic matter, nutrient deficiency, lack of soil biota, adverse soil chemical properties, exposed hostile geochemical materials, and any other factors impeding the effective rooting depth).	<p>Short term planning process</p> <p>Study appropriate gypsum-phillic fauna</p> <p>Study artificial seeding and cover cropping.</p> <p>See proposed trails in Section 9.2</p>
	Limited biological resources available on site.	Importation of topsoil/growth medium material.	If on-site topsoil/growth medium deficit is noted, material may be imported to assist in rehabilitation.
Weather Conditions	Adverse weather conditions during land clearing.	Land clearing activities will not be undertaken during adverse weather conditions.	<p>Land clearing will not be undertaken during periods of prolonged rainfall where damage to soil structure and erosion impacts are greatest.</p> <p>Land clearing will not be undertaken during periods of prolonged drought if there is high wind to prevent excess wind erosion.</p> <p>See 6.2.1 for further information</p>

Decommissioning Phase Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Infrastructure	Retained roads and hardstands are not safe and stable.	All roads and hardstand areas to be retained for the final landuse will be reduced in width/size to that suitable for the final landuse.	Roads not required for final landuse are removed. Hardstand areas reduced to a size required for the final landuse. Slopes of major tracks are to be <10degrees or have cross drains/banks installed. Where unsuitable soils are present, tracks are to be stabilised with crushed bricks, concrete, gravel or similar

Landform Establishment Phase Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Unstable landform	The final landform is unstable.	Continued monitoring of the landform establishment works by suitably qualified person/s.	Slopes to be reduced until all slopes meet the approved final landform. See 6.2.1 for further information
Final landform unsuitable for final landuse.	Final landform does not conform to approved final landform.	Landform to be remediated to approved final landform	Slopes to be reduced until all slopes meet the approved final landform. Survey plan or similar to be prepared to show final slopes meet the approved final landform.

Growth Medium Establishment Phase Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Unsuitable physical and structural substrate	Substrate compacted	Substrates to be placed in such a way to maintain soil structure as far as possible	Minimise vehicle movement over the emplaced substrates. Substrates to be lightly ripped to permit water infiltration and air penetration prior to topsoil placement.
Subsoil and topsoil deficit	Insufficient on-site material available for growth medium.	Available topsoils are stockpiled appropriately and reused on the site.	Records to include amounts of subsoil and topsoils stripped, locations and depths re-spread. If on-site topsoil/growth medium deficit is noted, material may be imported to assist in rehabilitation. See 6.2.1 for further information

Ecosystem and Land Use Establishment Phase Rehabilitation Risk Assessment

Hazard	Risks	Risk Controls	Details
Lack of target seed availability and quality	Seeds unable to be sourced for rehabilitation.	Study artificial seed spreading.	See trails in Section 9.2
Damage to seed through revegetation processes	Insufficient germination of seeds to provide groundcover.	Protect seeds from damage during rehabilitation.	Experienced operators to be employed for rehabilitation works. Rehabilitation areas to be protected from vehicular traffic by fencing or similar barriers. Minimize handling of seeds during storage and use.
Weed Infestation	Weed number overwhelm revegetation	Regular inspection and spraying for weeds will be undertaken.	
Inappropriate rehabilitation techniques	Failure of rehabilitation	Ensure approved rehabilitation procedures are followed	Experienced operators to be employed for rehabilitation works. Rehabilitation to be undertaken in accordance with the Rehabilitation Plan approved within the DA.
		Approved plans will be reviewed as required to ensure best practice techniques are employed.	
Adverse weather conditions	Failure of rehabilitation	Revegetation will not be undertaken during periods of drought.	
		Artificial watering to be trailed to enable germination	See trails in Section 9.2
		Rehabilitation works will not be undertaken during wet periods where soils and seed planting may be damaged	
Inappropriate Seasonal timing of revegetation	Failure of rehabilitation.	Revegetation will preferably be sown during the spring and autumn seasons to avoid hot and dry weather conditions and winter frost.	
Insufficient establishment of target species and limited species diversity	Vegetation community does not become established on final landform affecting final land use and ecosystem.	Sowing of additional seed mix for targeted species or additional species endemic to the pre-disturbance community. Use seed and mulch mix or other application techniques. Soil amelioration works such as addition of fertiliser. Additional weed control activities (mechanical and/or chemical)	See trails in Section 9.2

4. Part 4 rehabilitation objectives and rehabilitation completion criteria

4.1 Rehabilitation objectives and rehabilitation completion criteria

Rehabilitation Objectives Sourced from DA or SOEE	Final Landuse Domain	Mining Domain	Spatial Reference (e.g. A3)	Rehabilitation Objective Category	Rehabilitation Objectives
	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 and free of hazardous materials.
	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 any hazard to the community.
	Native Ecosystem	Infrastructure Area	A1	Land Contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
	Native Ecosystem	Infrastructure Area	A1	Management Of Wastes and Process Materials	Residual waste materials stored on site (e.g. tailings, coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended land use.
	Native Ecosystem	Infrastructure Area	A1	Landform Stability	Provide a low maintenance, geotechnically stable and safe landform which is

					commensurate with a continuation of grazing land use.
	Native Ecosystem	Infrastructure Area	A1	Landform Stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.
EIS 2008 - It is proposed to return the area to a similar if not better condition than it is currently in. (5.0 Rehabilitation Works)	Native Ecosystem	Infrastructure Area	A1	Landform Design	As far as practicable, to blend the created landforms with the surrounding land fabric.
	Native Ecosystem	Infrastructure Area	A1	Bushfire Management	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
	Native Ecosystem	Infrastructure Area	A1	Surface Water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
	Native Ecosystem	Infrastructure Area	A1	Water Approvals	Structures that take or divert water such as final voids, dams, levees etc. are appropriately licensed (e.g. under the Water Management Act 2000) and where required ensure sufficient licence

					shares are held in the water source(s) to account for water take.
	Native Ecosystem	Infrastructure Area	A1	Groundwater Quality	Groundwater quality is similar to, or better than the pre-disturbance groundwater quality.
	Native Ecosystem	Infrastructure Area	A1	Groundwater Regime	Impacts to groundwater regime are within range as predicted in pre-mining environmental assessment.
EIS 2008 - Revegetation of disturbed areas will occur using the topsoil that has been stored and will potentially contain indigenous seed. This method will reduce soil erosion from the site by decreasing the amount of time needed for the site to revegetate	Native Ecosystem	Infrastructure Area	A1	Native Ecosystem - Land Use Capability	Revegetation is sustainable for the long-term and only requires maintenance that is consistent with the intended final land use.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	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 and free of hazardous materials.
	Native Ecosystem	Active Mining Area	A5	Retention of Infrastructure	All infrastructure that is to remain as part of the final

		(Open cut void)			land use is safe and does not pose any hazard to the community.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Land Contamination	There is no residual soil contamination on site that is incompatible with the final land use or that poses a threat of environmental harm.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Management Of Wastes and Process Materials	Residual waste materials stored on site (e.g. tailings, coarse rejects and other wastes) will be appropriately contained / encapsulated so it does not pose any hazards or constraints for intended land use.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Landform Stability	Provide a low maintenance, geotechnically stable and safe landform which is commensurate with a continuation of grazing land use.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Landform Stability	The final landform is stable for the long-term and does not present a risk of environmental harm downstream/downslope of the site or a safety risk to the public/stock/native fauna.
EIS 2008 - It is proposed to return the area to a similar if not better condition	Native Ecosystem	Active Mining Area (Open cut void)	A5	Landform Design	As far as practicable, to blend the created landforms with the surrounding land fabric.

than it is currently in. (5.0 Rehabilitation Works)					
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Bushfire Management	The risk of bushfire and impacts to the community, environment and infrastructure has been addressed as part of rehabilitation.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Surface Water	Runoff water quality from mine site is similar to, or better than the pre-disturbance runoff water quality.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Water Approvals	Structures that take or divert water such as final voids, dams, levees etc. are appropriately licensed (e.g. under the Water Management Act 2000) and where required ensure sufficient licence shares are held in the water source(s) to account for water take.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Groundwater Quality	Groundwater quality is similar to, or better than the pre-disturbance groundwater quality.
	Native Ecosystem	Active Mining Area (Open cut void)	A5	Groundwater Regime	Impacts to groundwater regime are within range as predicted in pre-mining environmental assessment.
EIS 2008 - Revegetation of disturbed	Native Ecosystem	Active Mining Area	A5	Native Ecosystem - Land Use Capability	Revegetation is sustainable for the long-term and only requires

<p>areas will occur using the topsoil that has been stored and will potentially contain indigenous seed. This method will reduce soil erosion from the site by decreasing the amount of time needed for the site to revegetate</p>		<p>(Open cut void)</p>			<p>maintenance that is consistent with the intended final land use.</p>
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Once rehabilitation is complete, the remaining features will include the sparse trees and undulating sand dunes as per the pre mining environment.

The rehabilitation completion criteria requires 'sign off' from a suitably trained person in the monitoring report within 12 months of rehabilitation and site rehabilitation report. This includes rehabilitation success measured through annual photo-point monitoring and documenting estimates of type and cover of species, contours and soil stability.

4.2 Rehabilitation objectives and rehabilitation completion criteria – stakeholder consultation

As this type of mining activity has been in existence for decades, relevant stakeholders have been consulted and/or have provided permission to conduct mining and discussion around the previous rehabilitation plan. Such agencies and nearby landholders consulted with include:

- Wentworth Shire Council - in relation to the granting of consent for the activity and access issues to the site, including a site visit
- Department of Environment and Heritage- in relation to EPA licence requirements and impact on threatened species, including a site visit
- NSW Planning and Environment – Resources and Energy - in relation to the requirements of a lease, MOP, including a site visit
- NSW Department of Industry - Lands and Forestry - in relation to tenure and use of land on completion of the lease, including a site visit
- WaterNSW/DPI-Water – location and access to piezometers (groundwater monitoring wells) on the land.
- Natural Gypsum Association of Victoria - in relation to the quality of gypsum, latest harvesting techniques and best practice management
- Local Aboriginal community - (Barkindji Elders Council), in relation to the Aboriginal cultural heritage assessment and mitigation activities, involved in cultural heritage assessment and presentation and elders meeting
- Arumpo Bentonite – neighbouring property in relation to the proposed mining activities
- Morello Earthmoving – neighbouring property in relation to mining activities
- Murray River Salt – neighbouring lease-holder (ML1512) in relation to proposed mining activities
- Tapio Station - neighbouring property in relation to proposed mining activities

5. Final landform and rehabilitation plan

5.1 Final landform and rehabilitation plan – electronic copy





Project Boundary
Final_Landform_Contours

0 250 500 750 1,000 m

Final Landform Contours

Mallee Quarries
Gypsum Mine

Date of Creation: 02/05/23
FWP0001169
ESPG: 28354
Accuracy 0-5m

6. Part 6 – Rehabilitation implementation

6.1 Life of mine rehabilitation schedule

Rehabilitation Activity		Timing	Assumptions and Principle (Milestones)
Active mining	Any topsoil generated will be stored in perimeter bunds if final surfaces not available.	Up to 2031 (estimated)	Topsoil stripping is anticipated to be complete prior to 2031, when mining is expected to be completed.
Removal of product stockpiles	Any remaining material stockpiles will be removed offsite. If stockpile material remains it will be utilised in battering slopes to achieve the final landform.	Up to 2031	Raw material exhausted from extraction area. Mining has ceased.
Removal of Infrastructure	Removal of roads not required in the final landform for rehabilitation and maintenance.	Up to 2031	Mining has ceased. Infrastructure is no longer required for rehabilitation purposes.
Batter Slopes in-Pit	An overburden material will be utilised to assist in battering in pit slopes. Slopes will be lightly ripped where possible to key in topsoil material.	Up to 2031	Mining has ceased in target areas.
Topsoil Emplacement	Topsoil material stored in bunds. Final slopes will be lightly ripped where possible to key in topsoil material. Topsoil bunds will be removed and reused on final surfaces.	2022 to 2031	Applicable when final slopes have been achieved. Final slopes have been ripped. Topsoil is suitable for target species.
Establishment of Vegetation	Seeding/planting of natural species is undertaken on finished surfaces Watering/Irrigation as required to assist establishment of vegetation.	2022 to 2031	Applicable where final slopes have been achieved. Suitable topsoil has been spread on final surfaces available to date. Watering/irrigation to occur after if trailing is successful and is required.

Monitoring and Maintenance of Rehabilitation	Monitor progress of rehabilitation areas. Continue weed management and pest management. Repair failed rehabilitation areas.	2022 to 2031	Completion of vegetation establishment.
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6.2 Phases of rehabilitation and general methodologies

6.2.1 Active mining phase

A. Soils and material

The majority of the lease area has been disturbed from past grazing by livestock, rabbits, and mining activity. Topsoil depth is variable across the site. Topsoil will be pushed into windrows prior to excavation of gypsum. The gypsum will be excavated, processed and stockpiled for short periods. Gypsum is only mined on an as-needs basis. This will ensure the soil is protected from erosion by not having a large windswept area open at any one time.

A system of planned progressive rehabilitation will be implemented. The topsoil will be retained separately throughout the operation ensuring that any overburden is not mixed with topsoil. Overburden will not be deposited on an area until after the topsoil is removed and stockpiled. Overburden, if any occurs will be returned to worked out areas, levelled and then topsoil respread.

Previous rehabilitation onsite has proven effective using these methodologies. There is a risk of a topsoil deficit during the life of the mine due to the lack of existing resource – some areas are already bare gypsum. If a topsoil deficit is predicted, locally sourced topsoil maybe sourced in order to ensure the best outcome.

Mitigation Measures

- Supervision of earthworks will be undertaken by a suitably qualified person
- Areas to be land cleared will be clearly marked to ensure only land to be cleared is disturbed.
- Fallen trees are to be salvaged and reused immediately by placing on rehabilitated land. If no suitable rehabilitation areas are available felled trees will be stored in windrows for reuse in future rehabilitation.
- Topsoil stripping will only occur during suitable conditions e.g., not on days of rain or high wind.
- Topsoil will be removed and stockpiled prior to mining while ensuring there is no cross contamination by overburden.
- Topsoil will be stripped and stockpiled prior to placement of overburden if this is to be outside the opened mining area.
- Land clearing will not be undertaken during periods of prolonged drought if there is high wind to prevent excess wind erosion.
- Stockpiles of topsoil, overburden or gypsum will be located clear of any drainage lines.
- Access track to be located to avoid long slopes to minimise erosion. Cut-off drains to be constructed to minimise erosion.
- Topsoil stockpiles will not exceed 2m in height.
- Gypsum will only be excavated and processed on a need-be basis.
- Mining and processing will only occur during suitable conditions e.g., not on days of rain or high wind.
- After topsoil is reapplied to worked out areas, the ground is to be lightly ripped (depth 25cm @0.5m centres across the slope to create a roughened surface. The ripping operation must avoid exposing overburden. A rough surface will minimise wind erosion.
- Revegetation of disturbed areas will occur naturally by careful retention and reuse of the topsoil which will contain appropriate indigenous seed. This method will reduce soil erosion by decreasing the time needed to become stable.
- The sparse trees surrounding the mining lease area will be retained. The trees may provide some protection from wind erosion and have biodiversity value.
- Slopes no greater than 18degrees (3H:1V) to avoid erosion.

B. Flora

A general flora assessment (2007) was conducted across the current lease area. The vegetation characteristics of the study area consist of mainly gypsum flats with old, mined areas and non-homogeneous chenopod woodland. The flora assessment revealed no vegetation species; population

or communities which are of local, regional or state conservation significance.

Mitigation Measures

- Artificial seed saving and sowing trails are expected onsite to increase the native vegetation growth immediately after landform establishment.

C. Fauna

A general fauna assessment (2007) was conducted across the current lease area. The assessment revealed no species; population or communities which are of local, regional or state conservation significance.

Mitigation Measures

- Trees will be protected during mining activities with a buffer zone of at least 5m from the tree trunk to the edge of mining area.
- No trees will be cleared.
- Any fallen timber or tree stumps within the area to be mined will be carefully relocated to sites close to existing trees while avoiding crushing hollow logs.
- Mining pits and stockpiles are to be examined prior to work starting each day to remove any reptiles or other fauna that may be within the work site.
- Rabbits will be monitored every six months and control will be conducted if warranted. Deep ripping to control local population would increase the disturbance area. Poisoning has been ruled out because on the larger ecosystem. MEE Quarries is investigating other control methods including shooting.
- The mining lease will be monitored regularly for the presence of noxious weeds to avoid spreading weeds in gypsum being carted off site for agricultural use.
- Revegetation of disturbed areas will occur using the topsoil that has been stored and will potentially contain indigenous seed. This method will reduce soil erosion from the site by decreasing the amount of time needed for the site to revegetate.

D. Rock/overburden emplacement

The process produces no rock or overburden. Multiple crushing phases ensure all mined material is utilised.

E. Waste management

A commercial bin is located onsite at the infrastructure area. There will be no waste disposed of on site. The bin is removed regularly and emptied offsite.

Waste stream	Type	Risk	Compliance with
Discharge to air	Equipment emissions	Low	Manufacturing specifications EPA licence requirements
	Dust from processing	Low	EPA licence requirements
Discharge to surface water	N/A	N/A	N/A
Discharge to groundwater	N/A	N/A	N/A
Discharge to land	Waste	N/A - reused	Best practice management

	rock/overburden		
	Oil leak	Low	EPA licence requirements
	Grease	Low	EPA licence requirements
	Vegetation clearance	N/A - reused	EPA licence requirements

F. Geology and geochemistry

This surface mine is very basic and low risk to geology and geochemistry. The thin layer of topsoil is stripped and stockpiled for respreading during rehabilitation. The mining material is extracted and loaded on to truck before being screened. No wastes or ore is produced.

G. Material prone to spontaneous combustion

Gypsum does not ignite, eliminating the chance for spontaneous combustion.

H. Material prone to generate acid mine drainage

Acid mine drainage or venting does not apply to this site. No decomposition of wastes occurs at the site, which leads to the production of methane.

I. Ore beneficiation waste management

Not applicable on this site.

J. Erosion and sediment control

Erosion at the site can be caused by either water or wind. Water erosion of gypsum in stockpiles is not an issue as due to its porous nature, water infiltrates through to the soil profile underneath. The topsoil stockpiles (of 2m in height) are somewhat susceptible to water erosion in periods of high rainfall. The gentle undulating nature of the surrounding landscape limits any mobilised topsoil from moving down-slope any significant distance. Wind erosion can be an issue for stockpiled gypsum, as it can readily be blown away.

Mitigation Measures

- By using low stockpiles and only stockpiling crushed and screened material as required, airborne mobilisation of the mineral is minimised.

K. Ongoing management of biological resources for use in rehabilitation

Revegetation of disturbed areas will occur using the topsoil that has been stored and will potentially contain indigenous seed. This method will reduce soil erosion from the site by decreasing the amount of time needed for the site to revegetate.

L. Mine subsidence

The mine is not in a mine subsidence district and due to the shallow depth of the mineral does not apply to this proposal.

M. Management of potential cultural and heritage issues

No Aboriginal archaeological sites were identified during the cultural heritage assessment in 2008. It was noted that the area assessed is unlikely to have any Aboriginal archaeological sites due to its location so far from the river and the landscape not being useful for Aboriginal occupation. Due to no Aboriginal archaeological sites being identified on the surface, it is also unlikely that no sub surface sites exist either.

N. Exploration activities

Exploration activities would involve very little ground disturbance, usually with a post hole digger. Any topsoil will be kept to cover any holes that will be filled in after sampling.

6.2.2 Decommissioning

The lease will be relinquished on exhaustion of resource, decommissioning of infrastructure and mining areas are rehabilitated to a stable to ensure erosion does not occur. There are no permanent building or concrete structures onsite. A traffic barrier consisting of piled poles surround gypsum stockpiles.

A. Site security

The entire Crown Lands lot is enclosed within a fence line with all gates locked.

B. Infrastructure to be removed or demolished.

All equipment onsite is mobile and easily transported. No buildings are present.

C. Buildings, structures and fixed plant to be retired

Not applicable

D. Management of carbonaceous/contaminated material

Not applicable

E. Hazardous material management

Not applicable

F. Underground Infrastructure

Not applicable

6.2.3 Landform establishment

No modelling has been undertaken to achieve final landform. The mining process is quite simple with the land being levelled off.

A. Water management infrastructure

There is currently no water management infrastructure onsite and no plans to develop any.

B. Final landform construction: general requirements

When the gypsum resource is exhausted, the recently mined site will be levelled, with the final landform matching the undisturbed surroundings. lightly scarified and topsoil spread over with a front-end loader/bulldozer.

Rehabilitation will consist of a running a disk plough to create a large surface area for water catchment and blown seed retention when climatic conditions are suitable, preferably before forecast rain. This will aid further levelling of the site to existing contours and spread seed contained in topsoil across the mine site. Ripping along contours to a depth of 25cm with 50cm centres will assist in retaining rainwater to aid in natural recolonisation of vegetation.

C. Final landform construction: reject emplacement areas and tailings dams

Not Applicable

D. Final landform construction: final voids, highwalls and low walls

Not Applicable

E. Construction of creek/river diversion works

Not Applicable

6.2.4 Growth medium development

The site lies within the Murray Basin geological province. The area of assessment is characterized by gently undulating dunes of Aeolian origin incised by shallow drainage lines.

In areas of gypsum occurrence, the surface has been highly degraded by past mining activity without any evidence of reclamation. The majority of the proposed lease area has been disturbed from past grazing by livestock, rabbits, and mining activity. Topsoil depth is variable across the site.

Topsoil will be pushed into windrows prior to excavation of gypsum. The gypsum will be excavated, processed and stockpiled for short periods. Gypsum is only mined on an as-needs basis. This will ensure the soil is protected from erosion by not having a large windswept area open at any one time.

A system of planned progressive rehabilitation will be implemented. The topsoil will be retained separately throughout the operation ensuring that any overburden is not mixed with topsoil. Overburden will not be deposited on an area until after the topsoil is removed and stockpiled. Overburden if any occurs will be returned to worked out areas, levelled and then topsoil respread.

When the gypsum resource is exhausted, the recently mined site will be levelled, with the final landform matching the undisturbed surroundings. lightly scarified and topsoil spread over with a front-end loader/bulldozer.

Rehabilitation will consist of a running a disk plough to create a large surface area for water catchment and blown seed retention when climatic conditions are suitable, preferably before forecast rain. This will aid further levelling of the site to existing contours and spread seed contained in topsoil across the mine site. Ripping along contours to a depth of 25cm with 50cm centres will assist in retaining rainwater to aid in natural recolonisation of vegetation.

The most prevalent weed onsite is Tobacco bush. It germinates after the soil has been disturbed. There is a natural bloom after final topsoil spread but the plant dies back quick. Experience has shown leaving it reduces its spread as walking on the topsoil is enough to help germination. Any excessive weed growth will be treated with chemical sprays.

If there is a shortfall in topsoil (due to the limited topsoil already onsite), topsoil will be brought in from neighbouring communities.

6.2.5 Ecosystem and land use establishment

After the initial rehabilitation, the land is left for windblown seeds and the seedbank in the topsoil to germinate. The low viability of the soil means the a revegetation will be slow. MEE will always respread topsoil prior to autumn/winter to give the seeds a great chance of germination in winter rains.

6.2.6 Rehabilitation of areas affected by subsidence.

Not applicable

7. Part 7 – Rehabilitation quality assurance process

Rehabilitation success will be measured by drone flyovers and photogrammetry processing. This will give a high resolution, 2D plan of the rehabilitation area. Using this data will give highly accurate ground cover results. More rigorous monitoring is unnecessary due to the slow growth rates of vegetation at this location because of soil type and low rainfall.

Due to the limited capability of the land, minimal options exist for land use and closure concepts at cessation of the proposed land use. As stated in the EIS, it is envisaged that the site will be returned to at least a pre-lease condition with the MEE Quarries aiming for a vegetation response similar to that of the original vegetation community (Bladder Saltbush and Old Man Saltbush). A similar vegetation composition and dune gradients will be achieved to mirror the surrounding environment.

Key Actions – Baseline monitoring	Responsibilities	Records	Review
<p>Establish existing environmental baselines, which are to be used as the basis for rehabilitation completion criteria. A risk assessment process was undertaken to determine what baseline data is needed. This should also include consideration of development consent requirements and other relevant documentation including the EIS and Rehab Management plan.</p>	Mine Manager	Risk Assessment	Annual Rehabilitation Report

Key Actions - Before ground disturbance works	Responsibilities	Records	Review
<p>Mine Planning Systems Ensure mine planning systems provide sufficient time for the implementation of preclearance procedures to facilitate biological and habitat resources being appropriately identified and salvaged to minimise environmental impacts and maximise the viability for use in rehabilitation.</p> <p>Fauna Studies Define key plant species and targeted vegetation communities (e.g. plant community types) that would comprise the framework of the rehabilitation program. Plan seed harvesting and collection of plant material in advance of clearing and in consultation with suitably qualified practitioners (e.g. a 3-year lead time with a rolling collection program). Identify sufficient pre-disturbance and surrounding areas that can be used as seed or propagation resources Develop a seed collection program to maximise the amount of viable seed of local provenance for use in rehabilitation and revegetation activities. The program should include:</p> <ul style="list-style-type: none"> • a seed calendar that contains information relating to fruiting and seed collection times for key native species • data on seed collection including species, collection location and date of collection • seed assessment of native vegetation within the proposed disturbance areas to allow for seed collection prior to or immediately following clearing • required volumes of seed to be collected to enable adequate supply of native seed for reuse • appropriate treatment and storage to maintain viability • suitably qualified and experienced selectors • using record sheets and a geographic information system (GIS) database to track collection, storage and use of the seed resource. 	Mine Manager	<p>Weather data.</p> <p>Watercart usage/pumping volumes.</p> <p>Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report</p> <p>Section 8.3</p> <p>See Section 11</p>

Key Actions	Responsibilities	Records	Review
Active Mining (Land Clearing)			

<p>Topsoil Stockpile Management</p> <ul style="list-style-type: none"> • Slopes no greater than 3H:1V. • Topsoil stockpile height no greater than 2 metres. • Record volumes and locations of topsoil stockpiles. • Volume of material, topsoil and subsoil required for application to current and future disturbance areas • Estimate of the volume of suitable alternative material required to be imported onto site to supplement potential material, topsoil and subsoil deficits. • Only experienced operators will be engaged to conduct rehabilitation activities. <ul style="list-style-type: none"> • Areas to be land cleared will be clearly marked to ensure only land to be cleared is disturbed. • Topsoil material to be stripped will be used immediately or stored in stockpiles no greater than 2 metres in height and be revegetated with temporary grass species or otherwise stabilised as described in the erosion risk controls above. <ul style="list-style-type: none"> • Land clearing will not be undertaken during periods of prolonged rainfall where damage to soil structure and erosion impacts are greatest. • Land clearing will not be undertaken during periods of prolonged drought if there is high wind to prevent excess wind erosion. 	<p>Mine Manager Surveyor</p>	<p>Survey data of topsoil stockpiles. GIS data and plans. Soil inventory. Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>
<p>Overburden Stockpile Management</p> <ul style="list-style-type: none"> • Slopes no greater than 3H:1V. • Stockpile height no greater than 3 metres. • No stockpiles to be constructed in areas of concentrated flows. • Record volumes and locations of overburden stockpiles. • Volume of material, overburden required for application to current and future disturbance areas • Chronology of treatments (e.g. weed control, application of cover crop) undertaken on the stockpile. • Achieve groundcover factor of at least 0.05 (70% coverage) on stockpiles with long term inactivity. • Estimate of the volume of suitable alternative material required to be imported onto site to supplement potential material deficits. 	<p>Mine Manager Surveyor</p>	<p>Survey data of overburden stockpiles. GIS data and plans. Soil inventory. Reports from weed contractors. Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>
<p>Flora and Fauna</p> <ul style="list-style-type: none"> • Define key plant species and targeted vegetation communities (e.g. plant community types) that would comprise the framework of the rehabilitation program. • Plan seed harvesting and collection of plant material in advance of clearing and in consultation with suitably qualified practitioners (e.g. a 3-year lead time with a rolling collection program). • Identify sufficient pre-disturbance and surrounding areas that can be used as seed or propagation resources • Develop a seed collection program to maximise the amount of viable seed of local provenance for use in rehabilitation and revegetation activities. The program should include: <ul style="list-style-type: none"> • a seed calendar that contains information relating to fruiting and seed collection times for key native species • data on seed collection including species, collection location and date of collection • seed assessment of native vegetation within the proposed disturbance areas to allow for seed collection prior to or immediately following clearing • required volumes of seed to be collected to enable adequate supply of native seed for reuse • appropriate treatment and storage to maintain viability • suitably qualified and experienced selectors • using record sheets and a geographic information system (GIS) database to track collection, storage and use of the seed resource. 	<p>Mine Manager</p>	<p>Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>

Key Actions	Responsibilities	Records	Review
<p>Erosion</p> <ul style="list-style-type: none"> Slopes to be reduced to a maximum of 3H:1V in pit areas. Slopes of 3H:1V shall not be greater than 50 metres or they will be broken by catch drains to convey the surface water to the sediment dam to reduce erosion effects. Slopes of major tracks are to be <10 degrees or have cross drains/banks installed. Where unsuitable soils are present, tracks are to be stabilised with crushed bricks, concrete, gravel or similar. Track walk or lightly rip exposed surfaces to encourage infiltration of rainwater. <ul style="list-style-type: none"> Land clearing will not be undertaken during periods of prolonged rainfall where damage to soil structure and erosion impacts are greatest. Land clearing will not be undertaken during periods of prolonged drought if there is high wind to prevent excess wind erosion. 	Mine Manager	<p>Survey data. GIS data and plans. Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>
<p>Wind Erosion</p> <ul style="list-style-type: none"> Water cart to be engaged during mining, hauling and rehabilitation activities. <p>During adverse conditions:</p> <ul style="list-style-type: none"> Cease mining or hauling activities in adverse wind conditions: and Increase water cart frequency. 	Mine Manager	<p>Weather data. Watercart usage/pumping volumes. Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>

Key Actions	Responsibilities	Records	Review
Active Mining (Production)			
<p>Topsoil Stockpile Management</p> <ul style="list-style-type: none"> Slopes no greater than 3H:1V. Topsoil stockpile height no greater than 2 metres. Volume of material, topsoil and subsoil required for application to current and future disturbance areas Only experienced operators will be engaged to conduct rehabilitation activities. <ul style="list-style-type: none"> Areas to be land cleared will be clearly marked to ensure only land to be cleared is disturbed. Topsoil material to be stripped will be used immediately or stored in stockpiles no greater than 2 metres in height and be revegetated with temporary grass species or otherwise stabilised as described in the erosion risk controls above. <ul style="list-style-type: none"> Land clearing will not be undertaken during periods of prolonged rainfall where damage to soil structure and erosion impacts are greatest. Land clearing will not be undertaken during periods of prolonged drought if there is high wind to prevent excess wind erosion. Undertake topsoil and subsoil stripping when soils are moist (e.g. not saturated nor dry). MEE will develop and maintain a materials and soils balance and database to include the following information: <ul style="list-style-type: none"> location, age and quality of stockpiles chronology of treatments (e.g. weed control, application of cover crop) undertaken on the stockpile volume of material, topsoil and subsoil required for application to current and future disturbance areas (e.g. capping material for tailings dams, reject emplacement areas) an estimate of the volume of suitable alternative material required to be imported onto site to supplement potential material, topsoil and subsoil deficits. record data on the location of the stockpiled material including date stripped, source area, indicative volume, pre-strip plant community type. Information is to be stored using site-based GIS. 	<p>Mine Manager Surveyor</p>	<p>Survey data of topsoil stockpiles. GIS data and plans. Soil inventory. Reports from weed contractors. Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>
<p>Waste</p> <ul style="list-style-type: none"> Wastes will be stored in bins with a lid. Wastes will be removed by licenced contractor. 	Mine Manager	<p>Photography and site inspections reports.</p>	<p>Annual Rehabilitation Report Section 8.3 See Section 11</p>

Key Actions	Responsibilities	Records	Review
<p>Wind Erosion</p> <ul style="list-style-type: none"> Water cart to be engaged during mining, hauling and rehabilitation activities. <p>During adverse conditions:</p> <ul style="list-style-type: none"> Cease mining or hauling activities in adverse wind conditions: and Increase water cart frequency 	Mine Manager	Weather data. Water cart usage/pumping volumes. Photography and site inspections reports.	Annual Rehabilitation Report Section 8.3 See Section 11

Key Actions	Responsibilities	Records	Review
Decommissioning			
<p>Infrastructure (Removed)</p> <ul style="list-style-type: none"> Removal of all plant, equipment and associated infrastructure including processing facilities, stockpile areas, and loading facilities, portable offices (if installed). At the completion of exploration activity: Remove and lawfully dispose of all grid pegs, tags, sample bags, flagging tape, drill chips and other waste. 	Mine Manager	Photography and site inspections reports.	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3
<p>Stockpile Areas</p> <ul style="list-style-type: none"> All stockpiles are removed and or incorporated into the final landform. 	Mine Manager	Survey data. Photography and site inspections reports.	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3
<p>Waste</p> <ul style="list-style-type: none"> All rubbish/ waste materials removed from site. 	Mine Manager	Photography and site inspections reports.	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3

Key Actions	Responsibilities	Records	Review
Landform Establishment			
<ul style="list-style-type: none"> Slopes outside the final void are no greater than 3 horizontal to 1 vertical and slope lengths shall not exceed 50 metres before being broken by earth banks or similar. Final landform conforms to the approved final landform. 	Mine Manager Surveyor		Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3
Growth Medium Development			
<ul style="list-style-type: none"> Where permissible, should revegetation be delayed due to unsuitable seasonal conditions, undertake temporary stabilisation measures (e.g. sterile cover crops, erosion and sediment controls) to avoid erosion and further land degradation. Use appropriate earthmoving equipment to avoid compacting the rehabilitation substrate. Restore soil structure by scarifying or ripping (if soil compaction or erosion has occurred) in parallel with the contour. Apply soil ameliorants (where required) such as fertiliser to the substrate before the start of revegetation activities. Where access tracks are to be removed (e.g. not to be left as part of the final land use as defined by rehabilitation objectives and rehabilitation completion criteria), remove imported fill material (where used) and reprofile the disturbance area to the pre-existing landform. Topsoil shortages are to be supplemented with 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. Use structures such as tree hollows, logs and other woody debris, rock material to augment the target habitat value of native rehabilitation (if appropriate, in consideration of bushfire risks). 	Mine Manager	Photography and site inspections reports. Topsoil and overburden material inventory Soil testing results	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3
Ecosystem and Landuse Establishment			
<ul style="list-style-type: none"> Where adverse seasonal conditions (e.g. drought) or other factors affect the availability of local provenance seed and supplementary non-local provenance seed is required, seed stock should be purchased from reputable suppliers with quality control processes including seed viability testing. (It is good practice to record the name of the supplier and batch of seed being applied. Recording such details may assist in prevention/management of misidentified seeds). If revegetation is delayed due to unsuitable seasonal conditions, undertake temporary stabilisation measures (e.g. sterile cover crops, erosion and sediment controls) to avoid erosion and further land degradation. Spread seed as soon as possible following ripping/scarifying. If seeding is delayed following ripping/scarifying, undertake an assessment to determine whether further ripping/tilling is required before applying seed to ensure sufficient surface roughness (e.g. to break up any crusting that may have resulted from rainfall events). Develop a bushfire management plan (having regard to relevant ecological considerations and species fire tolerance) in consultation with NSW Rural Fire Service. Bushfire considerations should be factored into rehabilitation design (e.g. access tracks). Use appropriate earthmoving equipment to avoid compacting the rehabilitation substrate. 	Mine Manager	Photography and site inspections reports. Water testing results Seed viability certificates Water cart volumes and frequency Weather data	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3
Rehabilitation establishment inspections			
<ul style="list-style-type: none"> Conduct an initial establishment inspection no later than three months following the completion of each rehabilitation campaign to determine whether performance issues have occurred or are emerging, which have the potential to delay revegetation establishment. Conduct regular site inspections (e.g. at least quarterly) 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. 			

<ul style="list-style-type: none"> • Use drones or LiDAR to conduct additional inspections and analysis of developing rehabilitation. • Record outcomes of inspections and 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. <p>Rehabilitation monitoring program</p> <ul style="list-style-type: none"> • Implement long-term rehabilitation monitoring program and evaluate trajectory of rehabilitation against achieving rehabilitation objectives and rehabilitation completion criteria. • Broadly, the scope of the ecosystem rehabilitation monitoring program will be required to include indicators that measure site condition, vegetation composition and vegetation structure and ecosystem function. The range of indices should directly relate to the rehabilitation objectives and rehabilitation completion criteria identified for the specific ecological outcome. While the program should be designed to be comparable between monitoring periods, the program will also need to be flexible to enable incorporating evolving best practice in monitoring techniques. • The scope of the monitoring program will usually include photographic monitoring from fixed points. • Develop and implement a rehabilitation management and maintenance program based on the needs identified in the rehabilitation monitoring program. Included are as follows: <ul style="list-style-type: none"> • weed and feral animal control • erosion and drainage control works • monitoring and control of changes to surface and groundwater quality over time • reseeding/planting of failed rehabilitation areas (e.g. through lack of germination, high plant mortality rate) • repairing fence lines, access tracks and other general related land management activities • regular site inspections to assess rehabilitation performance. • The objective of this program is to facilitate rehabilitation progressing towards achieving the rehabilitation objectives and rehabilitation completion criteria in accordance with an approved progressive rehabilitation schedule (forward program). 			
Ecosystem and Landuse Development			
<ul style="list-style-type: none"> • Feral animal controls will be implemented if required. • Minimal erosion or land instability evident that would not require moderate to significant ongoing management and maintenance works. 	Mine Manager	Photography and site inspections reports.	Annual Rehabilitation Report Decommissioning Report See Section 11 Section 8.3

8. Part 8 – Rehabilitation monitoring program

8.1 Analogue site baseline monitoring

The baseline monitoring took place in the EIS 2008.

8.2 Rehabilitation establishment monitoring

The following inspection regime will be implemented at the commencement of the ecosystem establishment phase. The purpose of which is to enable early identification of issues that have the potential to delay vegetation establishment. To identify if triggers have been met in accordance with the Trigger Action Response Plan and to provide data for the continuous improvement of rehabilitation methods.

- Photographs of rehabilitated areas from designated photo points
- Aerial quarterly survey/photos of rehabilitated areas
- Photo analysis and quarterly inspections for landform stability, erosion, and vegetation growth.
- Maintain weed and feral animal control

A full Rehabilitation monitoring program is expected to be developed in 2023.

8.3 Measuring performance against rehabilitation objectives and rehabilitation completion criteria

9. Part 9 – Rehabilitation research, modelling and trials

9.1 Current rehabilitation research, modelling and trials

No trials are ongoing.

9.2 Future rehabilitation research, modelling and trials

9.2.1 Sterile crop growth

Purpose: reduction of erosion and addition of carbon by adding structure and organic matter to newly spread topsoil while waiting for native seed germination.

Scope: Initially a 10m x 10m area of freshly spread topsoil. The area will be hand sown with a selected crop and the mechanically dropped. A neighbouring site will be setup as control.

Risk addressed: lack of viable topsoil and organic matter available.

Timing: 2023; several years

9.2.2 Watering trials

Purpose: reduction of reliance on weather to enable ongoing germination and growth of natural flora

Scope: Initially an area 8m in diameter fed by a single sprayer, fed by a solar pump and onsite water.

Risk addressed: ongoing drought limiting germination and regrowth

Timing: 2025; several years

9.2.3 Spreading of Old Man Saltbush seeds

Purpose: Old Man Saltbush is part of the native ecosystem. Artificially seeding after topsoil respread may allow faster regrowth of fauna, protecting the topsoil.

Scope: Initially a 10mx10m area

Risk addressed: lack of viable topsoil and organic matter available

Timing: 2023; several years

9.2.4 Research into flora that thrives in gypsum

Purpose: Even with the total recovery of topsoil, underlying gypsum is a poor medium for regrowth. Further research into gypsumphilic fauna may allow for better revegetation outcomes.

Scope: build a list of gypsumphilic plants that can survive in arid conditions that are not devlared weeds in NSW.

Risk addressed: lack of viable topsoil and organic matter available.

Timing: 2025

10. Part 10 – Intervention and adaptive management

An early draft of the TARP has been included without the scientific and/or quantifiable evidence that each planned response action is suitable.

TRIGGER	ACTION	RESPONSE
Insufficient materials and resources to achieve satisfactory final landform.	<p>Review the final landform requirements / associated material requirements</p> <p>Assess these requirements against available resources.</p>	<p>Design final landforms in accordance with available resources.</p> <p>Assess availability of alternative sources of materials and their costs (if required)</p> <p>Source additional material where required.</p>
Insufficient topsoil and growth medium material available to achieve satisfactory revegetation	Assess topsoil resources and requirements.	<p>Assess availability of alternative sources of topsoil/growth medium material, and their costs.</p> <p>Source additional material where required.</p>
Landform unstable and unable to achieve revegetation.	Undertake investigations to identify the extent, source, and cause of the trigger.	<p>Based on the investigation, implement management measures such as:</p> <p>Use of available materials such as rock or stockpiled topsoil to stabilise areas identified</p> <p>Revegetate bare ground</p> <p>Assess water management and drainage structures</p> <p>Where required a specialist engineer may be required to assess the structural integrity and design appropriate remedial measures.</p>
Excessive erosion and / or sedimentation resulting in land instability and /or vegetation growth issues.	Undertake investigations to identify the extent, source, and cause of the trigger.	<p>Erosion and sediment control measures may be implemented including:</p> <p>Erosion channels or bare areas will be managed and eliminated where possible</p> <p>Rip areas will be managed to prevent instability and erosion where possible and provide similar pre mining flows</p> <p>Re-designing and construction of appropriate drainage lines</p> <p>Installation of sediment traps and fences downslope of erosion areas</p>

		<p>Use of available materials such as rock or stockpiled topsoil to stabilise areas identified</p> <p>Supplementary revegetation of any bare areas.</p>
<p>Poor vegetation establishment and growth.</p> <p>Poor vegetation establishment and growth.</p>	<p>Review rehabilitation records</p> <p>including methods, weather records, species used and photographs to determine the cause of poor rehabilitation establishment.</p> <p>Identify appropriate remediation measures.</p> <p>Ongoing monitoring to confirm supplementary measures have been successful.</p>	<p>The appropriate supplementary response will reflect the cause of limited vegetation response or growth. This may include:</p> <p>Testing of soil for contaminants, pH, or deficiencies</p> <p>Supplementary seeding of vegetated areas or topsoil</p> <p>Investigation into the possibility of utilising irrigation as part of the water management system to promote germination and establishment of vegetation, and</p> <p>Supplementary vegetation will be designed based on analogue sites and overall ecosystem structure to include the desired vegetation structure and species.</p>
<p>Weed and / or feral animal infestation</p>	<p>Rehabilitated areas will be assessed for key weed and feral animal species.</p> <p>Where a weed or feral animal species is observed an investigation will be undertaken to determine the extent of the invasion, possible sources, and the appropriate response</p>	<p>Appropriate management techniques specific to each species will be implemented to limit the invasion and colonisation of foreign weed and feral animal species such as:</p> <p>Significant weed infestations or noxious weeds will be removed in accordance with relevant guidelines</p> <p>Implementation of wash down and inspection procedures if required</p> <p>Vertebrate pests will be managed to be absent or kept under control and monitored on an annual basis.</p>
<p>Drought</p>	<ul style="list-style-type: none"> • Replace topsoil at end of summer. • Replace stumps to reduce wind erosion 	<p>Water rehabilitation areas to facilitate vegetation</p>
<p>Bush fire</p>	<p>Fire break in place</p> <p>Fire extinguishers and water truck onsite</p>	<p>Control fire if possible</p> <p>Contact Emergency Services.</p>

11. Part 11 – Review, revision and implementation

Current triggers now included:

Triggers	Process	Timing	Responsibility	Implementation/ Records
<p>Mining Regulation- Clause 11 of Schedule 8A</p> <p>The holder of a mining lease must amend the rehabilitation management plan for the mining lease as follows —</p>				
<p>(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,</p>	<p>The approved rehabilitation outcome document i.e. Rehabilitation Objective Statement, Rehabilitation Completion Criteria Statement or the Final Landform and Rehabilitation Plan (spatial data) will replace any proposed (and unapproved) documents.</p> <p>The Rehabilitation Management Plan (RMP) will be reviewed and amended to ensure it is consistent with the approved rehabilitation outcome document.</p>	<p>Within 30 days after the document is approved.</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>
<p>(b) as a consequence of an amendment made under clause 14 to a rehabilitation outcome document—within 30 days after the amendment is made,</p>	<p>The RMP will be reviewed and amended within 30 days if a rehabilitation outcome document is amended to ensure it is consistent with the approved rehabilitation outcome document.</p>	<p>Within 30 days after the amendment is made.</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>

<p>(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,</p>	<p>The RMP will be reviewed and amended as soon as practicable if a rehabilitation risk assessment determines that risk control measures must be changed.</p>	<p>As soon as practicable</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>
<p>(d) whenever given a written direction to do so by the Secretary—in accordance with the direction.</p>	<p>The RMP will be reviewed and amended as soon as practicable if directed by the Secretary.</p>	<p>As soon as practicable</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>
<p>Mining Regulation- Clause 13 of Schedule 8A- Forward Program and Annual Reporting</p>	<p>The RMP will be reviewed and amended as soon as practicable if the Annual Review identifies changes to the processes, risks, mining progress etc that are inconsistent with the current RMP.</p>	<p>As soon as practicable</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>
<p>Modification to Development Consent DA No. 08-0326</p>	<p>The RMP will be reviewed and amended as soon as practicable after the approval of any modification to the development consent and be consistent with and requirements under the amended consent.</p>	<p>As soon as practicable</p>	<p>Mine Manager/ Environmental Manager</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p>
<p>Amendment to the Rehabilitation Management Plan</p>	<p>The amended RMP will be provided to staff and relevant contractors and acknowledgement of the changes from staff will be recorded.</p>	<p>As soon as practicable after document is amended.</p>	<p>Environmental Manager/ Site staff and contractors.</p>	<p>The amended RMP will be include a record of document versions, dates amended and a brief summary of the amendments.</p> <p>Records of staff training and inductions are to be updated to include the amended RMP.</p>

