APPENDIX 7: REHABILITATION MANAGEMENT PLAN

KEYSBROOK MINERAL SANDS PROJECT

CONSERVATION AND REHABILITATION ENVIRONMENTAL MANAGEMENT PLAN, KEYSBROOK MINERAL SANDS PROJECT, MS810

DOCUMENT REFERENCE

CONSERVATION AND REHABILITATION ENVIRONMENTAL MANAGEMENT PLAN

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Mar 2013	1	Initial Document (Rehabilitation)	MM
Mar 2013	2	Updated to Conservation and Rehabilitation EMP	MM
Aug 2022	4	Updated EMP to support S45C (Lot 56)	CB
Apr 2023	5	Updated EMP to support S45C (Lot 63)	CB
Aug 2023	6	Updated EMP to support S.38 (Western Extension)	CB

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GLOSSARY

TERM	DEFINITION
BAM ACT	*Biosecurity and Agriculture Management Act 2007*
CAR	Compliance Assessment Report
CRMP	Conservation and Rehabilitation Environmental Management Plan
DBCA	Department of Biodiversity, Conservation and Attractions
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EMP	Environmental Management Plan
EPBC ACT	*Environmental Protection and Biodiversity Conservation Act 1999*
KLPL	Keysbrook Leucoxene Pty Ltd
MS	Ministerial Statement
PER	Public Environmental Review
WDMP	Weed and Dieback Management Plan

SUMMARY

This Conservation & Rehabilitation Environmental Management Plan (CRMP) is prepared in accordance with Condition 8 of Ministerial Statement No. 810 (MS810) and Condition 2 of the *Environmental Protection and Biodiversity Conservation Act 1999* Approval 2005/2016 for the Keysbrook Mineral Sands Mine (the Project) as indicated in Table 1. The proponent for the Project is subsidiary Keysbrook Leucoxene Proprietary Limited (KLPL), a subsidiary of Doral Mineral Sands Pty Ltd (Doral).

TABLE 1: CRMP SUMMARY

Proposal Name	Keysbrook Mineral Sands Mine
Proponent Name	Keysbrook Leucoxene Proprietary Limited
Ministerial Statement No.	MS810
EPBC Approval No.	2005/2016
Purpose of the EMP	Fulfil the requirements of MS810 Condition 8 and EPBC 2005/2016.
EPA Key Environmental Factor/s, outcome/s and objective/s	Re-establish self-sustaining local provenance native vegetation cleared in the implementation of the proposal, at a ratio of not less than 1.4:1 (i.e. 1.4ha of re-vegetation per 1ha of vegetation cleared).
Implementation Condition Clauses	MS810 Condition 6.1, 6.2 and 7.2 MS810 Condition 8 EPBC 2005/2163 – Condition 2
Key Provisions of the Plan	1. Return the land to its pre-mining use 2. Establish self-sustaining local provenance native vegetation appropriate to the underlying landform in planned areas including: 2.1. Establishing native vegetation corridors between local high value ecological areas. 2.2. Improving the ecological function of local major watercourses 2.3. Establishing native vegetation at a ratio of not less than 1.4 hectares of revegetation for every 1 hectare of native vegetation cleared. 3. Ensure a net gain in the extent and quality of breeding and foraging habitat for the Carnaby's Black Cockatoo, Baudin's Black Cockatoo and the Forest Red-tailed Black Cockatoo. In mined areas: 4. Re-establish a productive soil profile capable of supporting the target end land use.

	5. Re-establish functioning pasture suitable for productive grazing.

1. CONTEXT, SCOPE AND RATIONALE

1.1. PROPOSAL

Doral Mineral Sands Pty Ltd (Doral) through its subsidiary Keysbrook Leucoxene Proprietary Limited (KLPL), operate a mineral sands mine and primary processing plant (the Project) within an area of rural land near the townships of Keysbrook and North Dandalup, 70 km south of Perth (Figure 1). The Project is within the Shire of Murray and the Shire of Serpentine-Jarrahdale.

The Keysbrook Mineral Sands Mine targets a deposit containing high grade leucoxene. Leucoxene is a fine, granular, weathered titanium mineral used as feedstock for titanium pigment plants. The surface mining operation migrates across the land, and the shallow mine void is backfilled to pre-disturbance contours and generally rehabilitated within two years of mining.

The Project is located on privately owned land, used for grazing and other rural land uses. The currently approved area of disturbance is 1,532ha, within a 3,015ha Development Envelope (Attachment 3, Figure 2 of MS810). Two additional requests under Section 45C for additional mining areas were submitted to EPA in August 2022(Lot 56) and May 2023 Lot 63. No clearing was required for the amendments. Inclusion of these two requests will result in a total disturbance area of 1,745ha. Native vegetation approved for clearing ranges in condition from good to degraded. Doral has secured 75 hectares of native vegetation in two parcels through conservation covenants as per Condition 6 MS810. The area of mining approved under MS810, provides for 9 years of mining, which commenced in October 2015.

Based on the current mining schedule, ore reserves within the approved mine area as defined in (Attachment 3, Figure 2 of MS810), are due to be exhausted in 2024. In order for the continuation of the mine and workforce, KLPL seeks a significant amendment to the approved Proposal under Section 40AA to include an additional 511.64ha of mine area located immediately to the west of the currently approved Proposal. The 'amendment area' would increase the total mine area from approximately to 2,249ha. The additional disturbance area includes 21.04ha of degraded to completely degraded native vegetation, with the remainder comprising cleared pasture and some planted non-native vegetation. Mining the amendment area will result in approximately 5.5years additional mining for the Project.

To support the request to EPA to amend the Project under Section 40AA, KLPL has updated this Conservation and Rehabilitation Management Plan (CRMP) to incorporate the amendment area and demonstrate the amendment can be managed in accordance with existing Condition 8 of MS810.

1.2. KEY ENVIRONMENTAL FACTOR

The key environmental factors relevant to this CRMP are Flora and Vegetation and Terrestrial Fauna.

The Environmental Protection Authority (2015) describes the vegetation of the Perth and Peel region as being highly diverse in both structure and floristics including typical Australian plants such as the banksia, eucalypt and grevilleas. The highly cleared and fragmented landscape makes the diverse flora particularly vulnerable to extinction with many species confined to small remnants where weed invasion, disease and altered fire regimes add to the impacts of small population size. Similarly, the fauna of the Swan Coastal Plain has been significantly impacted since European Settlement. Three species of conservation significant black cockatoo use the region as foraging and breeding habitat including Carnaby's Black Cockatoo (*Zanda latirostris*), Baudin's Black Cockatoo (*Zanda baudinii*) and the Forest Red-tailed Black Cockatoo (*Calyptorhynchus banksii naso*). While native fauna are able to persist in small isolated remnants of

vegetation complexes; wetlands and waterways and the surrounding vegetation provide refuge habitat and allow fauna movement through the cleared landscape.

Although the majority of the approved mining area is cleared pasture, there are fragmented stands of remnant vegetation within some mine areas. Land rehabilitation and conservation actions will aim to return the land to the pre-mining land use and ensure a local net gain of native vegetation following mining activities. Potential risks to biological diversity and ecological integrity include degradation and fragmentation of habitat, introduction of invasive species and disease, altered fire regimes, grazing, altered water regimes and climate change.

Competition from weeds can impact the quality of remnant native vegetation and constitute a threatening process in the establishment of successful rehabilitation (pasture or native vegetation). Altered surface water regimes following mining and reinstatement of the land surface is a risk not only to water quality in water ways passing through the Project, but also in the potential for creating erosion on newly formed land surfaces and the loss of newly established vegetation. Similarly, the presence of *Phytophthora* infestations in the project area affects the design of native revegetation plans (i.e., plant translocations and species selection) and the potential spread of the pathogen offsite has the potential to threaten a range of native species and significant ecological communities on the Swan Coastal Plain.

Potential conservation and rehabilitation related risks arising from the Project which may impact on achieving success criteria are summarised in Table 2.

TABLE 2: POTENTIAL CONSERVATION AND REHABILITATION PROJECT RISKS

SOURCE	ACTIVITY	POTENTIAL IMPACT	INHERENT RISK
Mining and Exploration	Vegetation Clearing	Spread of invasive weed species to un-infested areas. Clearing of native vegetation outside of approved areas Loss of nesting and foraging habitat Fragmentation of remnant vegetation	High
	Topsoil removal and movement	Spread of invasive weed species to un-infested areas. Spread of Phytophthora dieback to un-infested areas.	Low
	Heavy and light vehicle movements	Loss of newly established native vegetation due to vehicle traffic	Medium
		Spread of invasive weed species to un-infested areas	Medium
		Spread of Phytophthora dieback to offsite un-infested areas.	Low
	Ore extraction and material replacement in pit	Altered surface water regime.	High

SOURCE	ACTIVITY	POTENTIAL IMPACT	INHERENT RISK
	Reinstatement of land surface profile including surface drainage	Surface erosion Altered surface water regime Increased sediment movement into steams	High
	Application of soil ameliorants when rebuilding soil profile in rehabilitation areas	Nutrient run-off into wetlands / streams / water ways	Medium
	Pasture re-establishment using purchased seed.	Introduction of new weed species in purchased seed spread in rehabilitation areas	Low
	Revegetation using seed and tube stock	Introduction of new weed species through planting tube stock in rehabilitation areas Native seed dormancy prevents germination Local provenance seed / seedlings not available for revegetation programs	Medium
	Translocation of native species	Spread of invasive weed species to un-infested areas. Spread of Phytophthora dieback to un-infested areas.	Low
Primary Production	Uncontrolled grazing	Degradation and further fragmentation of remnant vegetation Revegetation failure	Medium
	Application of fertilizer / soil ameliorants	Nutrient run-off into wetlands / streams / water ways	Medium
Natural events	Localised flooding	Introduction of new weed species Spread of Phytophthora dieback Erosion of rehabilitated areas Revegetation failure	Medium
	Altered fire regimes	Degradation and further fragmentation of remnant vegetation Loss of nesting and foraging habitat Revegetation failure	Medium

SOURCE	ACTIVITY	POTENTIAL IMPACT	INHERENT RISK
	Climate change	Degradation and further fragmentation of remnant vegetation Loss of nesting and foraging habitat Revegetation failure	Medium

1.3. CONDITION REQUIREMENTS

The Project was assessed and approved under Part IV of the *Environmental Protection Act 1986* on 19 October 2009, with the issuing of Ministerial Statement 810. Revisions to the Project were approved via Section 46C in June 2011 and Section 45C in February 2013 and October 2019. A Section 46 amendment to extend the time limit for commencement of the Project was made in October 2014. Further requests under Section 45C (Lot 56 and Lot 63) were requested in August 2022 and May 2023.

The Project was also approved by the Federal Minister for the Environment with *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) Approval 2005/2163 issued on the 16 February 2011.

This CRMP has been prepared to address the following Conditions in MS810 and EPBC 2005/2163.

TABLE 3A: CRMP MINISTERIAL CONDITION REQUIREMENTS

CONDITION NO.	CONDITION	RELEVANT SECTION OF CRMP
8	**Rehabilitation Management Plan**	
8.1	*Prior to the commencement of operations, the proponent shall submit a Rehabilitation Management Plan to the requirements of the CEO.*	Completed: March, 2013. Revised, this document
8.2	*The objectives of the Plan are to:* a. *re-establish self-sustaining local provenance native vegetation cleared in the implementation of the proposal, at a ratio of not less than 1.4:1 (1.4 hectares of revegetation per 1 hectare of vegetation cleared); and* b. *re-establish functioning pasture.*	1.4.4 1.4.6
8.3	The Rehabilitation Management Plan shall: a. describe measures to protect the areas to be revegetated from access, including grazing by stock; b. identify measures to translocate native plant species cleared for mining into revegetated areas; c. identify measures to eradicate weeds in the revegetation areas; d. identify measures to use dieback un-infested topsoil and dieback resistant species in the revegetation areas;	1.4.10 1.4.4 1.4.8 1.4.4, 1.4.9 1.4.4

CONDITION NO.	CONDITION	RELEVANT SECTION OF CRMP
	e. describe a strategy to revegetate areas, including the use of local species of local provenance, and establishment of middle storey and understorey species; f. identify completion criteria for revegetation; g. outline a revegetation monitoring programme.	1.4.12 1.4.13
8.4	The proponent shall implement the Rehabilitation Plan.	This document
8.5	The proponent shall review and revise the Rehabilitation Plan as and when directed by the CEO.	3.2
8.6	The proponent shall implement revisions of the Rehabilitation Plan required by condition 8.5.	2
8.7	The proponent shall make the Rehabilitation Plan (including all amendments) publicly available in a manner approved by the CEO.	4
8.8	The proponent shall ensure grazing stock are excluded from areas described in condition 8.2(a)	1.4.10
6	Protection of native vegetation	
6.1	*Prior to the commencement of clearing the proponent shall, in consultation with the DEC, ensure that a minimum of 75 hectares of native vegetation within the area cross-hatched in Figure 2 is protected in perpetuity by an instrument or instruments approved by the CEO.*	1.4.4, Figure 2
6.2	*The instrument or instruments referred to in 6.1 shall include the following:* b. *measures which have the objective of maintaining a functioning and self-sustaining vegetation community*	1.4.4
7	Protection of watercourses and wetlands	
7.1	*The proponent shall not clear vegetation or undertake mining activities:* a. *within 20 metres of the banks of watercourses shown in Figure 9 of the PER document*;	
	b. *within 100 metres of the boundary of a conservation category wetland.*	
7.2	*The proponent shall implement management measures (including but not limited to weed and disease control, revegetation and monitoring) in respect to the areas under 7.1 to achieve a functioning and self-sustaining vegetation community.*	1.4.4

TABLE 3B: CRMP EPBC CONDITION REQUIREMENTS

EPBC Approval 2005/2163		
Condition No.	**Condition**	**Relevant Section of CRMP**
2	For the better protection of the *Zanda latirostris* (Carnaby's Black-Cockatoo) and *Zanda baudinii* (Baudin's Black-Cockatoo), the person taking the action must prepare a conservation, offsets, and rehabilitation plan (the plan) to achieve the following outcomes in order of priority: a. preservation of at least 75ha of existing remnant vegetation which contains foraging and/or breeding habitat for the above species in a secure tenure such as a conservation covenant; b. improvement in quality of existing remnant habitat areas on site through rehabilitation and weed management strategies; c. expansion of breeding and foraging habitat offsite; d. rehabilitation of foraging habitat areas on the mining area. The plan must include: - criteria for determining the success of the plan; - parameters to be monitored and frequency of monitoring; - an assessment of the risks to achieving the success criteria; - measures that will be used to manage risks, including contingency measures; - reporting arrangements to management, external stakeholders and the public. The plan must be submitted to the Minster for approval. The action cannot commence until the plan is approved by the Minister. The approved plan must be implemented.	1.4.4, Figure 2 1.4.4 1.4.4 1.4.4 1.4.12 1.4.13 1.2 1.2.1 4 Completed March 2013. Revised plan 2019

1.4. RATIONALE AND APPROACH

Land rehabilitation consists of the design and construction of landforms; and the establishment of sustainable ecosystems dependent on the final land use post-mining. Mine site rehabilitation must consider:

- The long-term stability and sustainability of the landforms, soils and hydrology of the site; and
- The re-establishment of ecosystem capacity to provide habitats for biota and services for people.

An adaptive management approach which incorporates a continuous improvement focus (based on site-specific knowledge, research and monitoring) facilitates successful outcomes in rehabilitation. Effective and early planning contribute to minimising rehabilitation costs, plus progressive rehabilitation can provide an

early indication as to whether site rehabilitation objectives are realistic and achievable in addition to reducing long term mine closure liability.

1.4.1. LAND MANAGEMENT

The mine and surrounding land are currently used for agricultural purposes. The dominant industry of the area is dairy and beef cattle farming, although there are also smaller landholdings with hobby farms, horticulture, and semi-rural partial bush blocks.

The land in the mine area is held in private ownership under pre-1898 titles. These titles impart ownership of the mineral rights to the landowner not the State, and as such KLPL undertakes agreements directly with landowners regarding land access and compensation in relation to mining activities. These agreements can also specify rehabilitation requirements including returning the land to pre-mining land use.'

Management Approach

Landowners will be engaged and identify areas to be returned to pasture; and agree to defined revegetation areas. Pasture areas will remain under KLPL management for two years post the first seeding or until it has met the criteria defined in the respective landowner agreement. Native revegetation areas will be fenced to exclude grazing and will be monitored for 5 years or until it has met the rehabilitation objectives. Fenced areas will need to allow for the implementation of the various landowner's management strategies post mining.

1.4.2. MINE PLANNING

Mine planning schedules and plans the mining operations to optimise the fleet, the design of the mine, and to ensure the ore delivered for processing meets the specified requirements. Within the land rehabilitation components of the mine plan this typically includes:

- Pre-mining landform (contour) survey;
- Preparation of areas pre-mining: scheduling clearing, vegetation downsizing, wood chipping and stockpiling, topsoil removal and stockpiling;
- Scheduling the return of non-economic materials to the void or open pit (oversize and tailings return from the processing plant);
- Developing the post mining rehabilitation landform design;
- Allocation of resources to re-establishing the final landform (to meet the rehabilitation landform design);
- Allocation of resources to re-spread topsoil;
- Post rehabilitation landform survey;
- Within the Project area liaison with specific landowners on the location of activities during the period is also conducted.

Management Approach

Final landform design is based on pre-mining contours and surface water flows, creating positive fall to minimise ponding where possible, and ensuring the post mining landform blends seamlessly with the adjacent unmined landform. Landform design ensures minor drainage lines are reinstated within the

constraints of the underlying bedrock (coffee-rock) and drain across cadastral boundaries in the same locations as pre-mining. Final landform design is informed by the agreed final land use with the landowner.

The mine plan schedules clearing of vegetation and topsoil stripping together with stockpiling of these materials ahead of the mining operations. Clearing constraints (including area open and noise considerations) are directed by the specific management plans or as specified in MS810.

Topsoil is identified as the top 10cm of the soil and is stockpiled separately to native vegetation material. All materials stockpiled for rehabilitation are stored outside of the mine area.

Rehabilitation planning and execution is integrated in the mine planning process including the allocation of adequate resources to meet the planned land rehabilitation targets.

1.4.3. LANDFORM DEVELOPMENT

Materials excavated from the pit void are processed through the wet concentrator plant where the sand and clay materials are separated as part of the process of extracting the heavy mineral. In the first two and a half years of operations, sand tails were used to construct dams where the finer clay slimes were pumped and later reintegrated through the top meter of the soil profile using heavy machinery to mix the sand and clay slimes. Since 2018 sand and clay tails have been recombined at the process plant and co-disposed directly into the mined void, eliminating the need for heavy machinery mixing and reducing the requirement for reworking the reinstated profile.

Co-disposal allows for the pumping of the combined sand and clay mixture directly into the void using the final landform design to inform placement.

Management Approach

Land reprofiling shall be executed to design ensuring surface drainage reinstatement. The reinstated landform shall be similar to pre-mining areas and will match existing contours on adjacent unmined lands. Final surface profiles will reinstate water flows to pre-mining regional drainage and shall not result in higher than background levels of sedimentation in water channels. Natural contours shall be reinstated to minimise the risk of erosion.

With the co-disposal method the final soil profile will have a homogeneous mix of sand and clay, with the water holding capacity of the reconstructed soil profile being similar or better than pre-mining.

1.4.4. REVEGETATION AREAS

There has been extensive clearing of the native vegetation on the Swan Coastal Plain for urban, industrial and agricultural purposes, with only 29% remaining of the original extent within the Perth and Peel Region. The quality of waterways and wetlands has similarly deteriorated, with many wetlands also having been filled or degraded.

Key threats to biodiversity are clearing, degradation and fragmentation of habitat, introduction of invasive species, disease, and altered fire regimes. Typically, both management and strategic rehabilitation will be required to address these threats. Proactive planning is necessary for the restoration of ecological communities and landscape rehabilitation, reconnecting the fragmented network of natural areas, improve water drainage functions, sequester carbon and provide specific habitat requirements for fauna adversely affected by development such as the black cockatoos.

Improving the condition in existing protected natural areas and buffering of key areas together with the re-establishment of links between natural areas will contribute towards replacing critical habitat for threated fauna (EPA, 2015).

Management Approach

Revegetation works for the Project aim to improve ecological condition and function to an area that has been used for agriculture for many decades, with most of the existing native vegetation within the Project area in a degraded condition. As such it is recognised the planned revegetation areas are unlikely to achieve full ecological restoration within the life of the Project, however with measures to control feral pest species by exclusion and targeted baiting in addition to the creation and enhancement of revegetated areas will aim to establish a functional and sustainable ecosystem for indigenous fauna species.

Land clearing

Remnant vegetation within the approved mining footprint will be identified pre-clearing, and the area cleared of pasture or vegetation tracked. This process will ensure the area planned for revegetation meets the rehabilitation objectives and allows for any changes within the mine plan.

Conservation covenant

Two areas outside of the mining operations have been secured under Conservation Covenant and include remnant vegetation which is suitable for breeding and foraging habitat for the Carnaby's (*Zanda latirostris*), Baudin's (*Z. baudinii*), and Forest Red-Tailed (*Calyptorhynchus banksii naso*) Black Cockatoos (Figure 2):

- Northern Conservation Area – 50 ha (Lot 202 north of Elliott Road) and
- Southern Conservation Area – 27 ha (located on Lot 34).

A detailed spring flora and vegetation survey of the Conservation Covenant areas was undertaken in 2018 to establish a revegetation species list for the Northern and Southern Conservation Areas. This list has been used to plan and undertake revegetation efforts within the conservation areas and provides a reference list for the targeted revegetation species closure criteria.

Revegetation strategy

Revegetation areas are to cover at least 1.4ha for every 1ha of native vegetation cleared for the Project. Areas to be revegetated are required to be agreed with landowners to ensure they fit within the required management strategies of the land post mining.

Areas identified for revegetation aim to provide corridor linkages where possible between high value ecological areas such as conservation category wetlands, remnant vegetation, the Conservation Covenant areas, and the major creek lines passing through the Project footprint. The Conceptual Revegetation Plan (Figure 2) indicates planned revegetation areas, conservation covenants (Lots 202 and 34), habitat enhancement areas (within remnant vegetation stands), and revegetation areas (already planted).

Planned revegetation areas will be habitat mapped to enable selection of suitable plant species for each area, according to the soil type and local hydrology.

Species selection

Species considered for revegetation shall be suitable for the various habitat types in the Keysbrook area including: wetlands, damplands, sandplain, low relief dunes, and drainage / creek lines; and shall be selected (where available) from the list compiled in Appendix B. They will include plant species which:

- Provide foraging and breeding habitat for the Carnaby's, Baudin's and Forest Red-Tailed Black Cockatoos;
- Are associated with the Bassendean Dunes and Pinjarra Plain on the Swan Coastal Plain;
- Include species typical of overstory, mid and lower strata from the Bassendean Dune and Pinjarra Plain systems; and
- Include *Phytophthora* dieback resistant species.

Species selection to allow for the development of strata to support suitable fauna habitat and diversity to blend and create corridors with other local bushland remnants will be targeted to achieve that indicated in Table 4.

TABLE 4: TARGET PLANTING RATES TO ACHIEVE STRUCTURAL DIVERSITY

	LOW DUNES / SANDPLAIN	DAMPLANDS / PALUSPLAIN	SUMPLANDS / SEASONAL WETLANDS/ CREEKS
Stems / Ha (planted)	4500	4500	5000
Overstory	30% (15-25)	20% (15-25)	5% (5-10)
Middle story	40% (45-55)	50% (45-55)	40% (35-45)
Understory	30% (25-40)	30% (25-40)	55% (40-60)

Transplanting

Where possible transplanting of mature plants otherwise difficult to establish (such as *Kingia australis* and *Xanthorrhoea preissii*) will be determined ahead of clearing remnant stands of vegetation. Translocation will be considered where these plants:

- Have been previously identified as having a reasonable level of success in being transplanted, including an understanding of the required level of care to ensure successful re-establishment;
- Can be readily accessed from good condition remnant vegetation that is not affected by *Phytophthora* dieback;
- Can be relocated to areas outside of the mine path, which can be accessed for the required maintenance period (to allow for successful re-establishment).

Black Cockatoo Nesting Habitat

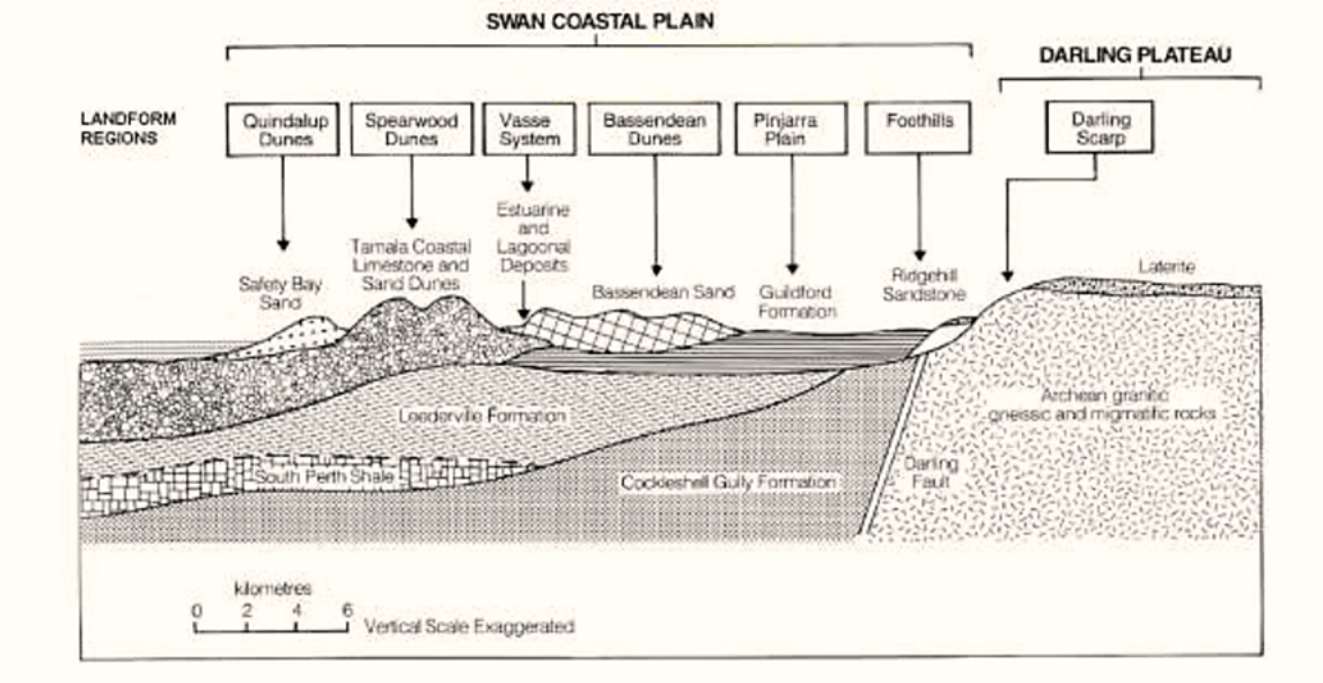
While there will be a net gain of native vegetation within the Project area post-mining, there will be a loss of mature trees containing potential nest hollows within the mine footprint. As it will take time for the revegetation areas to mature to the stage where they could provide nesting hollows, artificial nest boxes constructed to a proven design for large black cockatoos shall be installed in suitable areas.

30 artificially constructed nest boxes have been progressively installed by the Serpentine Jarrahdale Landcare Group within the Lot 202 Conservation Area since 2017 and monitored annually since installation. To date, monitoring results have shown no evidence of black cockatoo activity however annual monitoring shall continue for a minimum of 3 years post the cessation of mining.

1.4.5. SOILS

The Project occurs within the Peel-Harvey Catchment on the Swan Coastal Plain, predominantly within the Bassendean Zone. There are three soil-landscape zones identified within the Swan Coastal Plain as described by the Peel-Harvey Catchment Council (2015):

- Perth Coastal Zone – soils and landforms closest to the coast and include the Quindalup Dunes, Spearwood Dunes and Vasse Estuarine Deposits.
- Bassendean Zone – a complex of low dunes, sandplains and wetland depressions with pale deep sands. Bassendean sands are well draining, highly leached and have a very low nutrient holding capacity with a high risk of nutrient export. Superficial groundwater resources beneath the Bassendean Zone support a variety of uses, including public water supply and annual horticulture.
- Pinjarra Zone – comprised of the Pinjarra Plain and the Ridge Hill Shelf. The Pinjarra Plain is a flat, poorly drained alluvial plain with a variety of soils including grey deep sandy duplex soils, brown shallow loamy duplex soils and cracking clays.



SCHEMATIC 1: CROSS SECTION OF THE SWAN COASTAL PLAIN (adapted from Safstrom & Short, 2012)

While the Project footprint is mostly within the Bassendean Dunes, there are areas where the Bassendean sands are known to extend over the soils of the Pinjarra Plain.

Nutrient run-off into wetlands, streams and waterways from the application of fertilizers remains one of the largest contributors to the deterioration of water quality within the Peel-Harvey Catchment. The key land-use within the Project area is agriculture, and challenges of operating in this area are associated with the winter-saturated and highly permeable soils. These soils have a very low nutrient-holding capacity which is typically associated with the use of high levels of fertiliser.

The 2013 Report card on sustainable natural resource use in agriculture (DAFWA, 2013) provides a summary of the status of soil characteristics in the region. Key issues pertinent to the Project area soils are summarised in Table 5 and include:

- Soil acidity levels (pH) for the Swan Coastal Plain are generally poor to very poor and are considered likely to deteriorate further.
- Phosphorus Retention Index (PRI) for many of the soils on the Swan Coastal Plain is less than 10 which indicates a very low capacity to bind phosphorus to soil particles. The greater the PRI, the greater the phosphorus-holding capacity of the soil. This is particularly significant given the excessive nutrient levels entering the Peel-Harvey catchment and the various programs targeted at improving water quality in the waterways of the catchment. A soil's PRI can be increased with the application of ameliorants, such as natural clay.

TABLE 5: STATUS AND CONDITION TREND OF SOILS OF THE SWAN COASTAL PLAIN (DAFWA, 2013)

SOIL ASSET CHARACTERISTIC	STATUS/RISK	TREND
Soil acidity	Very poor	Likely deterioration
Wind erosion	Not assessed	
Water erosion	Low risk	Stable
Soil organic carbon levels	Good – very good	Measures not available
Water repellence	Very poor	Stable
Dryland salinity	Low risk	Stable
Nutrient status (phosphorus)	Excess	Stable
Nutrient export	Very high	Variable (mostly moderate to very high)

Management Approach

The Keysbrook Mineral Sands Project Nutrient Management Plan is a component of this Rehabilitation and Conservation Management Plan.

The reconstructed soil profile within the backfilled mine void consists of sand and clay co-disposal will include the amalgamation of sand tails and clay slimes returned to the mining void as part of the land forming process (Section 1.4.3). Stockpiled topsoil, removed from the mined area pre-mining, will be re-spread across the newly profiled landform.

Reconstructed soils will be sampled to determine nutrient and ameliorant input requirements, with a key focus on soil pH and on reducing the potential for nutrient export. This process is expected to contribute towards increasing the PBI of the soil and assist in improving the post mining soil profile.

Low pH values indicate soil acidity where the major elements required for plant growth (nitrogen, phosphorus and potassium) are less available to plants, with plant productivity falling when soil pH drops below 4.5. Within the reconstructed soil profile, both sub-soil and topsoil will be sampled to determine agricultural lime requirements to enable an average soil pH of 5.5 or greater. All reconstructed soils will have a pH above 4.5 within the pasture root zone of the soil profile.

Organic matter, or more specifically organic carbon is widely regarded as a vital component of a healthy soil, providing the energy source for soil microbes and as a reservoir of plant nutrients. As soil microbes break it down, nitrogen, phosphorus and sulphur are released and made available for plant uptake; organic matter also binds soil particles into aggregates necessary for soil structural stability. Soil carbon is involved in the adsorption of important plant nutrient cations (such as magnesium, calcium, sodium) that can significantly influence soil water holding capacity, especially in the sandy soils of the Project area; and it is important for the pH buffering capacity of the soil. Where possible, as part of the soil reconstruction process organic matter will be added to the newly established soil profile to improve the water holding, nutrient holding and the pH buffering capacity of the soil.

1.4.6. PASTURE RE-ESTABLISHMENT

Agriculture is the dominant land use in the Peel Harvey Catchment; according to DAFWA (2013) beef cattle and sheep grazing, and hay and pasture production, using clover and ryegrass-based pastures, are the most common activities, along with horticultural enterprises. Within the Project area the primary land-use is agriculture, the main commodities being beef, dairy and some horticulture, with much of the land within the project footprint under pasture.

According to DPIRD (2019) pastures play a major role in agricultural enterprises, with improved pastures increasingly taking on a more comprehensive role in farming systems to address emerging challenges for environment protection and food production.

Management Approach

To facilitate the return of productive mixed agriculture land use on existing freehold land commensurate with the surrounding areas. Considerations with establishing a pasture-based system sympathetic to future land use will include:

- Waterlogged sites may require improved surface water drainage (Section 1.4.3.1)
- Soil testing; status of major nutrients and soil pH to inform soil amendments and application rates (particularly in relation to potential for nutrient run-off; Section 1.4.5.1)
- Weed and pest control
- Pasture species selection
- Timing; where possible seed bed preparation should be completed to take advantage of early autumn rainfall so that seeding can be completed while the soil is still warm.

Weed and pest control

Effective Spring weed control to minimize weed seed set will assist with establishing a new pasture and ensure higher palatability of dry matter for summer grazing (upon handover to landowner). Where required topsoil stockpiles and new pasture rehabilitated areas will have weed control undertaken. Such control measures may include spraying with a non-selective herbicide about 3-4 weeks after weeds have germinated to reduce completion with pasture species (further detail refer Section 1.4.10.1).

Pest such as RLEM (redlegged earth mite) and Lucerne flea may require control measures to be undertaken. During emergence pasture seedlings should be inspected for damage from pests and spray as required.

Biomass control

While excessive biomass development in the pasture rehabilitation area can be seen as successful pasture establishment it can also create management issues such as increasing fire risk and can reduce the potential establishment of the pasture into the second season.

Newly established pasture may be lightly grazed 6-8 weeks after germination and once overall pasture height is 10-15cm and pasture is well anchored in the soil. An initial short intensive graze at this point will encourage further tillering and root development.

During the first summer dry pasture should be grazed with a short intensive grazing period, to remove the bulk of dry material allowing the seed to be exposed to high soil temperatures which assist in softening the seed, in turn encouraging germination at the break of the season in late autumn.

Where grazing is not an option due to a lack of infrastructure (e.g., fences, water) other options to remove the biomass excess may need to be implemented. This may include cutting for hay (September/October) or burning (usually in April). Removing this biomass from the rehabilitated pasture will contribute to the removal of potential organic carbon and associated nutrients from the soil, and additional nutrient supplementation is likely to be required prior to season 2 (informed by soil sampling; Section 1.4.5.1).

Pasture species selection

First year pasture rehabilitation is focused on soil development and the importance of choosing species with strong root systems to move through the new soil profile, encouraging soil microbes, and organic materials to develop through the upper profile. Forage oats are frequently used in renovating pastures and are seeded into the newly built soil due to their root vigor; clover is also a significant contributor to developing the new pasture due to its nitrogen fixation ability; and ryegrass an important contributor to a robust pasture also with strong root potential. The blend is chosen with the ability to develop in waterlogged soils common in the project area, and for rust and disease resistance.

If supplementary seeding is required in the second season, a pasture blend of ryegrass and clover will likely be used where this is compatible with the landowner's requirements.

Cover crops (such as cereal rye) will be sown on new land to assist with stabilization of the soil surface (and dust suppression) where areas are not competed in time for inclusion in the annual rehabilitation program.

Pasture program

Implementation of the pasture program will be largely driven by availability of the land, when it becomes available for rehabilitation post mining; and by seasonal conditions. Typically, a pasture development program might follow a similar outline as shown in Table 6. Approach to pasture re-establishment including seed mixes, fertilizers and application methods (and timing) will be undertaken in accordance with good agricultural practice in line with recommendations from the DPIRD for the Peel Harvey (Keysbrook) region

1.4.7. LOCAL PROVENANCE

To achieve the establishment of resilient, self-sustaining revegetation the use of known provenance plant material (seed and seedlings) is believed to reduce the risk of rehabilitation failure through:

- Using plants and seed genetically adapted to the local environment;
- Ability to adapt to changing environmental conditions;
- Increased survival rates.

While these are key to successful revegetation, it is also important to determine the risk of only using collections from small populations (in a fragmented landscape) as if too small and isolated they may also be suffering from reduced genetic diversity which in turn may result in reduced vigour and a poorer revegetation establishment.

Plants of local provenance tend to be better adapted to local conditions and prove to be more successful in revegetation works. The exception to this is revegetation of heavily impacted Phytophthora dieback areas where dieback-resistant strains sourced from other localities may need to be used.

Management Approach

A hierarchy of provenance will be applied:

1. Seed collected from the Project area or within the locality of the Project;
2. Seed collected from the Swan Coastal Plain within 20 km of the project;
3. Seed collected from the Swan Coastal Plain.

1.4.8. WEEDS

Weed surveys to date (2022) for the Project have recorded 34 weed species, excluding pasture species. The weed species are collectively known as environmental weeds (introduced plants that have established in a natural ecosystem and adversely contributing to a decline of natural communities).

There are a number of Declared Plants as listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act) known to occur in the Shire of Serpentine – Jarrahdale and Shire of Murray. The Department of Primary Industries & Regional Development (DPIRD) (2017) has developed a Declared plant surveillance plan for the South West Land Division of Western Australia which lists 15 prioritised declared weeds for control across Western Australia (including Weeds of National Significance). Community, industry and biosecurity groups have selected another seven species as high priority surveillance targets:

- *Gomphocarpus fruticosus* (narrow leaf cotton bush)
- *Zantedeschia aethiopica* (arum lily)
- *Echium plantagineum* (Paterson's curse)
- *Solanum* species (silverleaf nightshade *S. elaeagnifolium* and apple of Sodom *S. linnaeanum*)
- *Emex australis* and *E. spinosa* (doublegee)
- *Moraea flaccida* and *M. miniata* (cape tulip)
- *Rubus laudatus* (blackberry)

These species have been selected as priority targets as they are agricultural weeds which have an adverse effect on agricultural production or systems and are likely to be found in the South West Land Division of Western Australia.

Management Approach

A Weed and Dieback Management Plan as per Condition 9 MS810 as approved by the EPA is in place and documents the Dieback management measures for the site. Key weed management measures as outlined within this plan include;

- Education of employees and contractors through site EHS Induction requirements,

- Ongoing observation and annual survey of known declared or priority weed locations,
- Using accredited seed collectors for the collection of local provenance seed for revegetation, and
- Vehicle inspections and wash down location.

1.4.9. PHYTOPHTHORA DIEBACK

A 2006 baseline survey identified *Phytophthora cinnamomi* in the Project area (Figure 3; MBS, 2006). Additional surveys undertaken in 2013 and 2016 confirmed the presence of the pathogen in an area of highly disturbed remnant vegetation (Terratree 2013; 2016). The cleared, grazing areas that formed the majority of the 2013 and 2016 survey areas were determined to be unmappable (uninterpretable) given the absence of indicator species. Remnant vegetation in the area surveyed is classified as degraded, with few indicator species remaining. A 2017 Dieback risk assessment determined that these areas must be assumed to be infested and managed accordingly (Terratree, 2017). This determination can be applied to much of the project area given intensive and unrestricted livestock movement between areas of infested and excluded vegetation and periods of seasonal inundation across the lower areas. Similarly, the risk assessment concluded it is likely *P. cinnamomi* is present in the drainage lines and tributaries in the surrounding areas and hence the areas should be managed as if designated infested.

A *Phytophthora* Dieback assessment was completed by BARK Environmental (2021a; 2021b; 2023) of the amendment area. Due to historical disturbance activities, there is an overall absence of suitable native indicator plants necessary to enable assessment, which resulted in the entire subject area to being mapped as excluded. The Department of Biodiversity, Conservation and Attractions (DBCA) methodology for Dieback Assessment notes that in areas where Keighery disturbance ratings of 5 or greater occurs, such as Degraded or Completely Degraded areas, that assessment is not possible (DPaw, 2015). The assessment concluded that the amendment poses no significant risk to flora and vegetation as there is no significant vegetation remaining to be at risk. The assessment (BARK Environmental, 2023) recommends that:

- The Dieback Management Plan / EMP tactics for the disturbance activities within the proposal area should be kept simple because there is no susceptible intact vegetation remaining at the site;
- The key tactic to adopt at Excluded sites is to 'arrive clean and leave clean' to avoid introduction and/or spread of diseases and weeds within and beyond the subject area;
- Should any areas be retained for revegetation that includes plants susceptible to *Phytophthora* disease, it is recommended that standard Dieback hygiene protocols are included during inductions, at entry/exit points, clean-down of footwear/vehicles/equipment and the sourcing of seedlings is preferrable from a NIASA accredited nursery to minimise risk of disease introduction;
- Plants within any revegetation areas displaying disease symptoms could be sampled as soon as practicable for early detection, diagnosis and treatment using Phosphite application.

Management Approach

A Weed and Dieback Management Plan as per Condition 9 MS810 as approved by the EPA is in place and documents the Dieback management measures for the site. Key dieback management measures as outlined within this plan include;

- Site personnel and contractor education through EHS induction requirements;
- Vehicle inspections;

- Dieback signage;
- Limestone entrance road to site.

1.4.10. ACCESS

Access to rehabilitation areas within the mine footprint is controlled through the site entry gate, with all traffic on site restricted to established roads and tracks. Access into conservation covenant areas is also controlled.

All newly established rehabilitation areas will be excluded from livestock grazing to allow for plant development. Pasture areas will remain under KLPL management for at least a one-year period after seeding, and revegetation areas for at least 5 years or until rehabilitation objectives have been achieved. Vehicle access will be directed via firebreaks and established tracks.

Management Approach

Fencing will be maintained around all rehabilitation areas to ensure exclusion of stock. Revegetation areas will have a 20m buffer established where possible between boundary fences and the planting zone to designate areas where vehicle access is permitted; all access into revegetation areas will be gated.

Conservation covenant areas have controlled access, with gates into these areas locked to exclude unauthorised entry.

1.4.11. BUSHFIRE

Fire is an important part of the environment on the Swan Coastal Plain and has been present in Western Australia for millions of years, influencing the evolution of plants and animals. It also poses a very real risk to communities, homes, and businesses, particularly in the semi-rural environment in which the Project is located. Uncontrolled bushfires across the South-west of Western Australia have increased in frequency and intensity in recent years, causing significant damage to property, forests and loss of life. The risk of operating in such environments must be considered and proactively managed.

Fire management while aiming to protect human life and property also must protect and conserve biodiversity.

Management Approach

A Fire Management Plan has been prepared for the Project.

Where revegetation areas are to be established adjacent to a cadastral boundary a minimum 5m buffer will be maintained where possible between the planting zone and the boundary fence. This will allow for landowner vehicle access to undertake fence maintenance and ensure a cleared firebreak in accordance with Shire requirements and with minimal tree overhang as the vegetation matures.

1.4.12. COMPLETION CRITERIA

Completion criteria are the measures against which implementation of objectives can be assessed. The criteria aim to ensure rehabilitated areas will display self-sustaining characteristics of surrounding areas and provide Regulators and other key stakeholders confidence that, to the maximum possible extent, they can be managed in the long term according to the intended land use, using normal management practices without the input of additional resources.

Management Approach

The assessment of rehabilitation against the completion criteria is applied throughout the various stages of the rehabilitation operations and during the early years of ecosystem development (Table 6).

Completion criteria are subject to review and revision on a regular basis to allow for learnings from trials, monitoring, improved knowledge, industry practices and changes in standards.

TABLE 6: COMPLETION CRITERIA

Criterion	Criterion objective	Criterion Standard / Milestone	Verification
1. Final Land use			
1.1 Final land use	Agreed final land use has been determined in consultation with relevant stakeholders	End land use for the area is agriculture – grazing and it is expected that most areas will be returned to pasture. Agreement has been obtained from landowners as to locations of revegetation and pasture areas.	Land owner agreements identify revegetation zones, fences and pasture areas.
2. Safety			
2.1 Safety	There are no unsafe areas where community stakeholders could gain inadvertent access	All hazards that could endanger the safety of any person or animal have been identified and eliminated where practicable.	Inspections to ensure structures are safe and security is maintained.
2.1 Landform safety	Final landforms are safe	No unacceptable hazards to humans or wildlife have developed through erosion, subsidence, or otherwise	Inspections of rehabilitated landforms have been conducted to monitor their stability over time, including after significant rainfall events. Rehabilitation monitoring results.
3. Landforms			
3.1 Visual amenity	Visual amenity of rehabilitated areas is compatible with the local surrounding areas	Reinstated landforms blend into the surrounding landscape.	Landforms are consistent with the agreed final land use (criterion 1.1)
3.2 Surface stability	The reconstructed surface is stable and showing no signs of significant erosion	Reconstructed slope surfaces are stable. No areas exposed to risk of significant erosions defined as having: • Channelized flow resulting in extensive active gullies	Visual assessment and monitoring results.

Criterion	Criterion objective	Criterion Standard / Milestone	Verification
		• Failure of drainage lines or banks • Evidence of ongoing significant sheet erosion	
4. Hydrology			
4.1 Surface Water	Rehabilitation drainage patterns have been established and impacts on natural surface water flows are acceptable at key receptors.	There are no significant physical off-site impacts as a result of the operations. Major creeks flowing through the project area show no significant increase in sedimentation or nutrient load when compared to baseline levels.	Water monitoring records and reports.
5. Sustainability			
5.1 Sustainability	Rehabilitation is sustainable, and the land capability is suitable for the agreed end land use.	Monitoring inspections indicate that the rehabilitation will be sustainable, and will continue to fulfil rehabilitation objectives relating to the agreed final land use for pasture and revegetation areas	Documented in relevant monitoring reports
5.2 Resilience	Vegetation is sustainable and resilient to likely impacts such as drought, fire and Phytophthora Dieback	Species selection for revegetation areas includes Phytophthora Dieback resistant species. Monitoring results demonstrate recruitment of native perennial species is occurring or is likely to occur on the site (e.g., evidence of flowering, fruiting, soil seed bank or second-generation seedlings). Monitoring has shown that the rehabilitation can survive one or more seasons of low rainfall (total annual rainfall <50% of average, or more than 2yrs of rainfall <75% of average).	Documented in relevant monitoring reports

Criterion	Criterion objective	Criterion Standard / Milestone	Verification
5.3 Provenance	Revegetation species are of local provenance	Vegetation is endemic to the Swan Coastal Plain and sourced locally where possible, and typically are associated with the Bassendean Dunes and Pinjarra Plain.	Monitoring results confirm species colonizing revegetation areas are either known in the local area or are endemic to the Swan Coastal Plain
5.4 Weeds	Potential for rehabilitation to meet agreed post-mining land use is not limited by the presence of weeds	All requirements of the Weed and Dieback Management Plan have been implemented. No Declared Pests (as defined under the BAM Act) are present in greater abundance than baseline surveys indicate. Populations of environmental weeds have been monitored and controlled; weed abundance does not exceed 15% cover.	Review weed monitoring and control undertaken to ensure compliance with the approved Weed and Dieback Management Plan. Monitoring and visual inspection results.
5.5 Reconstructed soil profile	Soil profiles are shown to have the capacity to support mature plant communities to meet the agreed final land use requirements	Soil pH in the reconstructed soil profile will be higher than baseline. Soil pH is expected to be above pH4.5 with an average above pH5 across a rehabilitation area. No channelized flow resulting in gullies greater than 30cm deep and 25cm wide are evident.	Documented in Annual Compliance Assessment report. Monitoring and visual inspection.
5.6 Vegetation development	Vegetation is suited to the final land use	Pasture areas and revegetation areas are identified and planned according to the landowner agreements. Species selection for revegetation areas allow for natural variations in soil, landform and hydrology.	Documented in Annual Compliance Assessment report.
5.7 Early establishment revegetation (<2yrs)	Initial plantings provide sufficient numbers and diversity to allow for the development of endemic plant species from each stratum to establish.	Plantings include species typical of overstory, mid and lower strata from the Bassendean Dune and Pinjarra Plain systems.	Documented in Annual Compliance Assessment report. .

Criterion	Criterion objective	Criterion Standard / Milestone	Verification
		Where seedlings are the primary revegetation, initial plantings to be an average of 4,500 stems/ha across all project areas. Monitoring of native plant abundance and species richness to ensure successful establishment at a survival rate of 75%.	
5.8 Maturing revegetation (3-5+yrs)	Revegetation demonstrates sustainability trends, with similarities in structure and species richness to remnant vegetation.	Monitoring results demonstrate recruitment of native perennial species is occurring or is likely to occur on the site (e.g., evidence of flowering, fruiting, soil seed bank or second-generation seedlings). Species richness is ≥60% of the target seedling list (Appendix 1). Species density of maturing native plants is ≥2,000 stems per hectare.	Documented in Annual Compliance Assessment report.
5.9 Nutrient cycling	Soil nutrient cycling process evident.	Developing leaf litter layer is evident (early establishment revegetation, maturing revegetation). Litter breakdown can be observed (maturing revegetation)	Documented in Annual Compliance Assessment report.
5.10 Fauna habitat	Revegetation supports native fauna habitat and foraging habitat for the Black Cockatoo's.	Species within revegetation areas meet foraging and habitat requirements for Black Cockatoo's. Key fauna habitat characteristics are present in revegetation areas including: vegetation structure, diversity of flowering species and a developing litter layer.	Documented in Annual Compliance Assessment report.

Criterion	Criterion objective	Criterion Standard / Milestone	Verification
6. Closure – sign-off			
6.1 Land capability	Rehabilitation is sustainable, and the land capability is suitable for the agreed end land use.	Outcomes relating to soil, flora, fauna and water indicate that rehabilitation will be sustainable and fulfil the rehabilitation objectives.	Documented in Annual Compliance Assessment report.
6.2 Land management	Rehabilitated land management requirements return to pre-mining levels.	Long term management requirements will not be greater than those of areas prior to mining. Where additional management actions may be required, a mechanism has been established to support them.	Documented in Annual Compliance Assessment report.

1.4.13. MONITORING

Monitoring is required to evaluate the performance of rehabilitated landforms and to assess whether they have either met the Project completion criteria (objectives, goals and targets) or are showing satisfactory progress towards meeting these criteria.

Observing, recording and monitoring the results of various rehabilitation treatments is required to identify the success or otherwise of the treatments in order to inform changes and different approaches to improve the success for future work (adaptive management). These results also contribute to assessing and analysing progress to identify whether objectives, goals and targets are being attained.

Management Approach

Progressive rehabilitation and ongoing performance assessment will be carried out in areas where mining and related operations have been completed and further disturbance is unlikely. Monitoring results shall be used to assess whether initial establishment has been successful, rehabilitation is developing satisfactorily, and when it is ready for sign-off. Research activities such as field trials shall be undertaken where knowledge gaps or deficiencies in rehabilitation progress occur.

Monitoring events will be undertaken in line with the process outlined within this section, with the outcomes informing rehabilitation strategies, facilitating refinement in completion criteria and directing maintenance and remedial action plans consistent with the adaptive management approach (Section 3.1). Assessing whether an area has met all criteria will require compilation of all relevant site records of rehabilitation operations, monitoring data, photographic records and summarising these in a short report.

Should ongoing monitoring indicate risks to the achievement of established completion criteria then appropriate maintenance and/or remedial work will be undertaken. Further monitoring will be subsequently undertaken on repaired areas to demonstrate improved compliance with the relevant criteria.

Monitoring of rehabilitated areas will be undertaken during the period the rehabilitated land is managed by KLPL to demonstrate the rehabilitation objectives have been met. Where possible rehabilitated land shall be handed back to the landowner once criteria defined by landowner agreements and completion criteria have been achieved. The first monitoring event will be undertaken within 12 months following completion of the rehabilitation works. Monitoring will take into consideration reconstructed soil profile areas (mined areas) and be tailored to the designated end land-use of each area as indicated:

- Reconstructed soil profile;
- Pasture rehabilitation;
- Revegetation.

Reconstructed soil profile

Monitoring will be undertaken to assess parameters related to soil nutrient status and landform stability during the period the rehabilitated land is managed by KLPL (Table 7). Most reconstructed soil profile areas will be returned to pasture and it is expected these areas will be returned to the landowner within two years of rehabilitation being completed.

TABLE 7: MONITORING – RECONSTRUCTED SOIL PROFILE

ASPECT	PARAMETER	ASSESSMENT	FREQUENCY
Landform stability	Surface stability and erosion	Visual assessment	Annual, and after heavy rainfall events
Sustainable soil profile	Soil sample analysis including pH, EC, OC, available and total macro and micronutrients	Comparative analysis	Baseline (pre-mining) Annual (post-reconstruction)
Potential for nutrient leaching off site	Soil sample analysis including PBI	Comparative analysis	Baseline (pre-mining) Annual (post-reconstruction)
	Water sampling (Total N, nitrate, Total P) from creeks flowing through project area.	Comparative analysis	As per Water Monitoring Management Plan
	Particle size analysis (sub-soil sample 10-30cm depth)	Comparative analysis	Baseline (pre-mining) Year 1 (reconstructed soils)

Pasture rehabilitation

Monitoring will be undertaken to assess parameters related to pasture establishment during the period the rehabilitated land is managed by KLPL (Table 8). It is expected that pasture areas will be returned to the landowner within two years of rehabilitation being completed.

TABLE 8: MONITORING – NEW PASTURE

ASPECT	PARAMETER	ASSESSMENT	FREQUENCY
Productive pasture	Germination and establishment (plant health)	Visual assessment	Monthly after seeding for 4 months

Revegetation

Monitoring of revegetation areas (including conservation areas, habitat enhancement zones, shelter belts, revegetation plantings and revegetation corridors) and will be undertaken to assess:

- Initial establishment (first two years from planting) – early establishment monitoring will provide feedback on stability and erosion of revegetation areas plus an assessment of survival and growth of planted areas.
- Revegetation development (every second year from Year 3) – maturing revegetation monitoring will be working towards demonstrating completion criteria achievement.
- Fauna habitat– monitoring will ensure objectives towards providing suitable habitat for local fauna, with a particular focus on the Black Cockatoos is achieved.

Parameters monitored, as listed in Table 9, specifically relate to completion criteria (Section 1.4.12).

TABLE 9: MONITORING – REVEGETATION

ASPECT	PARAMETER	ASSESSMENT	FREQUENCY
Uncontrolled grazing	Fencing in place and maintained to excluded livestock	Visual assessment	Six monthly
Landform stability	Surface stability and erosion	Visual assessment	Annual, and after heavy rainfall events
Revegetation	Indicators that the site is establishing appropriately to maturing rehabilitation stage criteria: native plant abundance, species richness.	Early establishment monitoring	Annual (Year 1 and 2)
	Weeds	Visual assessment	As per Weed & Phytophthora Dieback Management Plan
	Vegetation establishment demonstrates drought resilience and sustainability trends; and similarities in structure, foliage cover and species richness to remnant vegetation stands in the Keysbrook area and wider Peel-Harvey catchment	Maturing revegetation monitoring	Every second year (e.g., Year 3, 5)
Nutrient cycling	Nutrient cycling process evident: developing leaf litter layer, litter breakdown	Visual assessment	Every second year (e.g., Year 3, 5)
Fauna habitat	Key fauna habitat characteristics are present in revegetation areas: vegetation structure; litter breakdown; presence of key forage species for Black Cockatoos	Maturing revegetation monitoring	Every second year (e.g., Year 3, 5)
	Cockatube nesting boxes assessed for evidence of nesting activity and any maintenance requirements	Visual assessment	Annually
	Black Cockatoo roosting numbers	Great Cocky Count	Annually

2. ENVIRONMENTAL MANAGEMENT PLAN PROVISIONS

Table 10 provides a summary of the objective based EMP to meet legal requirements of Condition 9 of MS810.

TABLE 10: OBJECTIVE BASED EMP PROVISIONS

Management Target 1.0	Return the land to its pre-mining use				
Item	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
1.1	Agreement with landowners to define pasture areas and revegetation zones.	• Agreement recorded	• Internal records	Ongoing	Mining Superintendent
1.2	Final landform design to be based on pre-mining contours, creating positive fall to minimise ponding where possible.	• Final landform contour designs available	• Licenced surveyor Internal records	Ongoing	Mining Superintendent
1.3	Mine plan schedules clearing of vegetation, topsoil stripping and stockpiling ahead of mining.	• Not more than 30ha of cleared land open ahead of mining at any time. • Topsoil and vegetated matter stockpiled separately outside mine area.	• Licenced surveyor Internal records	Ongoing	Mining Superintendent
1.4	Rehabilitation planning is integrated in the mine planning process including allocating adequate resources.	• Progressive rehabilitation of areas identified in the mine plan achieved	• Weekly mine plan • Annual budget and rehab provision review • Annual Compliance Assessment Report	Ongoing	Mining Superintendent
1.5	Sand and clay material separated during processing are recombined such that the water holding capacity	• Soil sampling results pre-mining and post mining are within a comparable range of sand and clay particles	• Internal metallurgical records	Ongoing	Mining Superintendent

Management Target 1.0	Return the land to its pre-mining use				
Item	Management Action	Performance Indicator	Reporting	Timing	Responsibility
	of the soil is the same or better than it was prior to mining.				
1.6	Land reprofiling executed to design ensuring drainage reinstatement.	• Survey pick up of final surface (prior to topsoil spreading) provides confirmation of positive drainage across the rehabilitation areas except where otherwise planned (designed).	• Licenced surveyor Internal records	Ongoing	Mining Superintendent

Management Target 2.0	Establish self-sustaining local provenance native vegetation appropriate to the underlying landform in planned areas				
Item	Management Action	Performance Indicator	Reporting	Timing	Responsibility
2.0.1	Baseline survey undertaken to define remnant vegetation communities and establish a census in Conservation Covenant areas.	• Survey report available	• Internal records	Prior to revegetation activities being undertaken	Environmental Coordinator
2.0.2	Revegetation plans allow for various habitats including creeklines/drainage, damplands, wetlands and low dunes.	• Habitat species lists defined and available to inform revegetation plans	• Internal records	Ongoing	Environmental Coordinator

Management Target 2.0	Establish self-sustaining local provenance native vegetation appropriate to the underlying landform in planned areas				
Item	Management Action	Performance Indicator	Reporting	Timing	Responsibility
2.0.3	Soil survey of revegetation areas to inform planting requirements.	• Soil supports revegetation establishment • Soil ameliorants added where required (as directed by soil sampling results).	• Internal records	Ongoing	Environmental Coordinator
2.0.4	Revegetation material (seed/seedlings) to be of local provenance.	• Seed/propagation material collected for revegetation programs to be from the Swan Coastal Plain	• Internal records	Ongoing	Environmental Coordinator
2.0.5	Identify and plan for use of plant species resistant to Phytophthora Dieback in revegetation areas.	• Revegetation plans identify Phytophthora Dieback resistant species	• Internal records • CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator
2.0.6	Prevent weeds smothering revegetation.	• Manual or chemical control activity to be recorded against the relevant population in the Weed Management Register	• CAR • EPBC Compliance Report • Weed Management Register	Ongoing	Environmental Coordinator
2.0.7	Fencing in place to protect revegetation zones	• Revegetation areas protected from stock grazing and unauthorised vehicle movements • Fences maintained	• CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator

Management Target 2.0	Establish self-sustaining local provenance native vegetation appropriate to the underlying landform in planned areas				
Item	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
2.0.8	Firebreaks in place	• 20m firebreak established between cadastral boundary fences and revegetation zones. • Firebreaks maintained	• CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator
2.0.9	Development and execution of completion criteria	• Completion criteria (Section 1.4.12; Table 6) achieved	• Monitoring records • CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator
2.0.10	Rehabilitation Monitoring	• Monitoring planned and undertaken as scheduled. • Monitoring results used to inform the ratification of completion criteria metrics.	• Monitoring records • CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator

Management Target 2.1	Establish native vegetation corridors between local high value ecological areas.				
Reference	Management Action	Performance Indicator	Reporting	Timing	Responsibility
2.1.1	Identify potential corridor linkage areas between conservation category wetlands and high value remnant vegetation	• Revegetation plans indicate potential landscape corridors linking areas of ecological value. • Landowner agreement in place to establish corridors of native vegetation.	• Internal records	Ongoing	Environmental Coordinator

Management Target 2.2	Improve the ecological function on major creek lines.				
Reference	Management Action	Performance Indicator	Reporting	Timing	Responsibility
2.2.1	Creek bank stabilisation (where required)	• Improved water quality and habitat value with acceptable levels of erosion • Pool-riffle sequences installed	• Internal records • Monitoring records • CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator

Management Target 2.3	Establish native vegetation at a ratio of 1.4 hectares of revegetation for every one hectare cleared.				
Reference	Management Action	Performance Indicator	Reporting	Timing	Responsibility
2.3.1	Land clearing records identify area of native vegetation cleared	• Remnant vegetation with in the mine footprint identified	• Licensed surveyor internal records • CAR	Ongoing	Environmental Coordinator

Management Target 2.3	Establish native vegetation at a ratio of 1.4 hectares of revegetation for every one hectare cleared.				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
		• Clearing of remnant vegetation tracked and recorded			
2.3.2	Revegetation plans identify required area for native plant establishment	• Land disturbance tracker used to determine required area of revegetation to meet 1.4:1 ratio. • Revegetation plans (including potential landscape corridors and Conservation Covenant areas) identify a minimum of 1.4ha for every 1ha cleared area for native vegetation establishment	• Internal records • CAR • EPBC Compliance Report	Ongoing	Environmental Coordinator

Management Target 3	Provide a net gain in the extent and quality of Black Cockatoo foraging and breeding habitat				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
3.1	At least 75ha of remnant vegetation established under Conservation Covenant.	• Conservation covenant areas established. • Revegetation plans include Conservation Covenant areas.	• Internal records • CAR • EPBC Compliance Report	Completed	Environmental Coordinator
3.2	The expansion of Black Cockatoo breeding and foraging habitat.	• Revegetation plans include forage and habitat species suitable for Black-Cockatoos.	• Internal records • CAR	Completed	Environmental Coordinator

Management Target 3	Provide a net gain in the extent and quality of Black Cockatoo foraging and breeding habitat				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
		• 20 constructed nesting boxes suitable for the large Black-Cockatoos established within Conservation Covenant areas to provide suitable nesting habitat. • Survey of remnant vegetation to be cleared from the mine footprint identifies potential nest hollows to be replaced with constructed nesting boxes within appropriate conservation / revegetation areas.	• EPBC Compliance Report		

Management Target 4	Re-establish a productive soil profile capable of supporting the target end land use				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
4.1	Soil survey pre- and post-mining to inform soil rebuilding ameliorant requirements.	• Topsoil and subsoil samples from pre-disturbance mine areas analysed. • Topsoil samples from stockpiles and subsoil samples from rehabilitation areas analysed.	• Internal records	Ongoing	Environmental Superintendent

Management Target 4	Re-establish a productive soil profile capable of supporting the target end land use				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
		• Soil results used to inform fertilizer and soil ameliorant requirements (as advised by suitably qualified agronomist or soil scientist).			
4.2	Pasture areas to be identified separately to revegetation areas and ensure appropriate soil ameliorants identified.	• Revegetation areas identified in rehabilitation plans • Soil sample analysis results used to inform soil-rebuilding ameliorant requirements specific for pasture or native revegetation.	• Internal records	Ongoing	Environmental Superintendent
4.3	Topsoil respread following subsoil reinstatement (including mixing of required ameliorants)	• Topsoil in place ready to seed	• Internal records	Ongoing	Environmental Superintendent
4.4	Open level areas (post-mining) not planned to be fully rehabilitated in the current year stabilised to prevent dust lift-off.	• Corn rye or similar stabilisation crop established prior to summer.	• Internal records	Ongoing	Environmental Superintendent

Management Target 5	Re-establish functioning pasture suitable for productive grazing.				
Reference	**Management Action**	**Performance Indicator**	**Reporting**	**Timing**	**Responsibility**
5.1	Planned pasture rehabilitation areas seeded at the beginning of the growing season for both Year 1 and Year 2 rehabilitation where required.	• Pasture mix seeded into completed rehabilitation areas at the beginning of the growing. • Good establishment of pasture species (including root development).	• Internal records • CAR	Ongoing	Environmental Superintendent
5.2	Year 2 rehabilitation fertilizer requirements informed by soil sampling analysis	• Soil sampling from pasture rehabilitation areas undertaken to inform application schedules prior to growing season (where required).	• Internal records • CAR	Ongoing	Environmental Superintendent
5.3	Rehabilitation areas erosion free.	• No evidence of erosion in rehabilitation areas • Remediation undertaken as required	• Internal records • CAR	Ongoing	Environmental Superintendent
5.5	Rehabilitation areas fenced.	• Stock excluded from continuous grazing for at least 1 year or until land is returned to landowner management.	• Internal records • CAR	Ongoing	Environmental Superintendent

3. ADAPTIVE MANAGEMENT AND REVIEW OF THE EMP

This EMP applies the principles of adaptive management through monitoring, corrective actions and implementing changes. The EMP is intended to be dynamic and will be updated to reflect changes in management practices over the life of the Proposal. This will also allow flexibility to respond to new environmental impacts and adopt new technologies/management measures.

3.1. MONITORING TRIGGERS, THRESHOLDS AND CONTINGENCY

Triggers, thresholds and contingency for the rehabilitation are included in Table 11 based on the management targets and actions previously described.

If monitoring identifies a non-conformance/non-compliance with EMP targets, the incident will be assessed and corrective actions implemented. The corrective actions are aimed at preventing recurrences of the incident taking place.

TABLE 11: MONITORING TRIGGERS, THRESHOLDS AND CONTINGENCY ACTIONS

MANAGEMENT TARGET	MONITORING PARAMETER	TRIGGER	CONTINGENCY ACTION
Return land to its pre-mining land use	Land survey to ensure stability and reinstatement of surface water flows. Agronomy assessment to measure soil parameters and crop yield.	Monitoring results show soil parameters and crop yields have not met the final agreed land use.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.
Establish self-sustaining local provenance native vegetation in planned areas	Annual monitoring to ensure progression towards achieving revegetation closure criteria.	Monitoring results indicate risks to the ability to meet closure criteria.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.
Establish native vegetation corridors between local high value ecological areas	Annual monitoring to ensure progression towards achieving revegetation closure criteria.	Monitoring results indicate risks to the ability to meet closure criteria.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.
Improve the ecological function on major creek lines	Annual monitoring to ensure progression towards achieving revegetation closure criteria.	Monitoring results indicate risks to the ability to meet closure criteria.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.
Establish native vegetation at a ratio of 1.4 hectares of revegetation for	Annual planting schedule to ensure progression towards meeting closure criteria.	Monitoring results indicate risks to the ability to meet closure criteria.	Revisit onsite planting activities and conduct infill planting to achieve completion criteria.

MANAGEMENT TARGET	MONITORING PARAMETER	TRIGGER	CONTINGENCY ACTION
every one hectare cleared	Ongoing land management activities (e.g., weed control, fencing) to ensure success of revegetation program.		
Provide a net gain in the extent and quality of Black Cockatoo breeding and foraging habitat	Cockatoo installation and annual monitoring program. Annual monitoring to ensure progression towards achieving revegetation closure criteria.	Installed artificial hollows do not provide suitable additional breeding habitat. Monitoring results indicate risks to the ability to meet closure criteria.	Revisit onsite planting activities and conduct infill planting to achieve completion criteria.
Re-establish a productive soil profile capable of supporting the target end land use	Land survey to ensure stability and reinstatement of surface water flows. Agronomy assessment to measure soil parameters and crop yield.	Monitoring results show soil parameters and crop yields have not met the final agreed land use.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.
Re-establish functioning pasture suitable for productive grazing	Land survey to ensure stability and reinstatement of surface water flows. Agronomy assessment to measure soil parameters and crop yield.	Monitoring results show soil parameters and crop yields have not met the final agreed land use.	Revisit revegetation plan to ensure methods of action are able to progress to revegetation success.

3.2. EMP REVISIONS

This EMP will be reviewed on an annual basis during the life of the Project, or as required. The EMP review will take into account the adaptive management and continual improvement process, new or revised information relevant to weeds and dieback and/or changes to the Project.

3.3. REPORTING

This EMP will be reported annually in KLPL's Annual Compliance Assessment Report (CAR), to meet Condition 8 of MS810.

3.4. AUDITING

Doral (on behalf of KLPL) is committed to its environmental performance and has developed, implemented and continually improved its Environmental Management System (EMS) since it was established in 2001. Doral's EMS is in line with the requirements of the Australian/New Zealand Standard AS/NZS ISO 14001:1996 (ISO 14001).

Doral's EMS consists of the following key elements:

- Environmental Policy and Objectives;
- Environmental Planning;
- Implementation and Operation;
- Checking and Corrective Action;
- Management Review.

The Checking and Corrective Action component of Doral's EMS relates to the monitoring and evaluation of Doral's environmental performance and consists of the following elements:

- Monitoring and measurement;
- Non-conformance and corrective and preventive action;
- Records;
- EMS audits;
- Annual review and update of the Environmental Risk Assessment and management procedures for the Project.

Doral will achieve continuous improvement for the Project by conducting an annual review and update of the Environmental Risk Assessment, risk treatments and management plans/procedures. Any additional risks and/or alternative forms of treatment/management that result in an improved outcome for site activities will be adopted and the EMS will be updated accordingly.

4. STAKEHOLDER CONSULTATION

Stakeholders who have been identified as having an interest in the environment surrounding the proposed amendment have been consulted and will continue to be consulted and informed through the approvals phase. KLPL has been engaging with all stakeholders since project commencement in 2012 and startup of operations in 2015. This consultation has been in the form of regular community updates (every 6 – 12 weeks), newsletters and meetings as required for specific development or operational updates. Communications and meetings with key stakeholders specific to the proposed amendment has been undertaken subject to environmental and landholder approval.

The existing stakeholder communications database and register has been utilised for the proposed amendment, including the continued documentation of stakeholders issues/ concerns raised and the outcome of the consultation.

A summary of stakeholder engagements is outlined in Table 12.

TABLE 12: STAKEHOLDER CONSULTATION

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
Doral owned property Lot 63 – Hopelands Road	Leaseholder receives regular site update letters, various meetings held. Extension update 4/4/23, 14/4/23, 23/8/23 and various discussions with Mine Manager	Under agreement. Doral purchased in 2022, subject to lease arrangement. Ongoing engagement. Property included in western extension.	Seek alternative grazing pasture when mining commences.
Lot 507 Lot 1 – Hopelands Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone conversation with family 10/07/23	Discussions ongoing in regard to extension proposal.	Amenity agreement discussion in progress, commitment to keep in informed in regard to project milestones.
Lot 508 – Elliott Road	Receives regular site update letters, various meetings held.	Under Mining Agreement, regular engagement on various matters in relation to mining agreement. Property included in western extension.	Supportive of project, timing around commencement of mining is highest concern, seeking early mining commencement.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
	Extension update 4/4/23, 14/4/23, 23/8/23		
Lot 64 – Elliott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting held on 15/08/2023	Under Agreement, ongoing engagement, primary concerns are noise and dust. Property is included in extension, no mining agreement secured.	Continue to work with landholder in regard to management of these matters. Proactive actions remain being avoidance of topsoil removal in high winds, water cart usage on roads, predictive noise modelling to manage mine activities based on weather. Keep informed of timing associated with Lot 63. Continued discussion with Mine Manager on operational matters.
Doral Owned property Lot 212 – Elliott Road	Doral purchased in August 2023. Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call with tenant 22 /08/23	Doral owned, tenant under Agreement. Property included in extension.	Ongoing engagement with tenant, new lease agreement in progress.
Doral owned property Lot 20 – Hopelands Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call 22/08/23	Under agreement. Ongoing engagement. Tenant informed of extension and timelines.	Query in regard to length of tenancy in relation to western extension, extended stay permitted subject to approvals. Commitment to keep informed.
Doral owned property Lot 211 – Hopelands Road	Ongoing engagement Receives regular site update letters.	Under Agreement. Tenanted, informed of extension and timelines.	Keep informed in regard to approval developments for Lot 63 and broader western extension.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
	Extension update 4/4/23, 14/4/23, 23/8/23		
Lot 212 – Hopelands Road	Ongoing engagement, receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting 9/06/23	Under agreement. Tenanted, various conversations with owner, receives community updates.	Keep informed in regard to approval developments for Lot 63 and broader western extension.
Lot 11 – Hopeland Road	Regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23	No residence.	Keep informed in regard to approval developments for Lot 63 and broader western extension.
Lot 12 – Readheads Road 2 residences	Ongoing engagement Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call 16/08/23	Advised had noticed water table had dropped, no other issues raised.	Advised we had community bore monitoring program and could be included on this. Will revert if any issues, will also pass on message to neighbour. Keep informed in regard to approval developments for Lot 63 and broader western extension. Meeting to be requested in regard to amenity agreement discussion.
Lot 101/ 102 – Readheads Road	Ongoing engagement Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting 23/08/23	At meeting discussed proposed mine plan and timings. Queried if exploration had been completed on property.	Meeting in progress to provide information on exploration data. Keep informed in regard to approval developments for Lot 63 and broader western extension. Meeting to be requested in regard to amenity agreement discussion.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
Lot 5 – Readheads Road	Ongoing engagement Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 16/08/23 – phone call attempt, no answer.	Deceased estate, unaware of new owner details.	In progress to ascertain new owner details. Correspondence has been sent to same address as previously.
Lot 506 – St Blaise Grove	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call 16/08/23	No issues. Receives all site community update letters, issued quarterly.	Will keep informed of any developments.
Lot 3 – Hopeland Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone conversation 14/08/23	No issues, mining not a problem in previously mined areas.	Commitment to keep informed in regard to approvals and the western extension, meeting to be requested in regard to amenity agreement discussion.
Lot 309 and 310 – Hopeland Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23	No feedback received in regard to extension letters.	Keep informed in regard to approval developments for Lot 63 and broader western extension. Meeting to be requested in regard to amenity agreement discussion.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
Lot 700 – Hopeland Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call and text 23 /08/23	Under agreement, house is tenanted, no issues	No concerns, commitment to provide updates when available. Will continue to keep informed.
Lot 701 – Hopelands Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting held 15/7/23 Phone call 21 /08/23	Under agreement. Ongoing engagement. Concerns raised as to proximity of mining to residence, noise and dust.	Advised same mitigation measures will be implemented and commitment to further discussion and collaborative approach when mining relocates closer to residence.
Lot 12 – Hopelands Road (2 residences)	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting 3/5/23 Text on 21 /08/23	Under agreement, two houses. Discussions held around western extension.	No specific concerns, advised same mitigation measures will be implemented and commitment to further discussion and collaborative approach. Continue to keep informed, will contact when available for further meeting in relation to Lot 63.
Lot 503 – Elliott Road	Phone call 25/07/23. Copy of letter dated 4/4/23 and 24/08/23 sent via email.	No issues, house not tenanted. Land managed by caretaker / farm manager, owner resides overseas, no intention to rent. Western extension letter sent to Farm Manager to forward on to owner. Farm manager advised no issues with the proposal and will seek feedback from owner.	Will keep informed of any developments.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
Lot 500 – Elliott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone conversation 7/08/23	Property is Under Offer, has been on market for significant time. Various conversations around Iluka tenement. Email received from Owner on 7/10/21 providing approval to EPA for Doral to mine Lot 64. No issues in regard to current western extension.	Was not willing to sign amenity agreement whilst property remains for sale. Doral requested when property is sold, to advise who the new owners are to arrange a meeting.
Lot 20 – Elliott Road	Receives regular site update letters. Meeting 3/8/21 Extension update 4/4/23, 14/4/23, 23/8/23 Meeting held 15/08/23, site tour on 23/08/23	Under agreement. No major issues, noted on some occasions can hear site on still nights, clearing of native vegetation.	Toured site on 23/08/23, will keep informed of any developments.
Lot 1, 2, 67 – Hopelands Road (2 residences)	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting held 23/08/23	Various discussions, amenity agreement previously presented. Issues include: noise can be heard at night on occasions, dust is a significant concern and especially in regard to the race horses, clearing of native vegetation.	Environment Manager detailed mitigation and preventative measures to be implemented to address concerns raised. Advised further meeting beneficial to run through finalised environmental plans. Advised will follow up in the new year in regard to amenity agreement. Offered site tour.
Lot 2 – Hopelands Road	Obtained details from owner of Lot 1,2,67	Meeting request in progress.	
Lot 501 – Hopelands Road	Receives regular site update letters.	No issues, has worked with Doral (previously MZI Resources previously).	Follow up meeting in progress in regard to amenity agreement. Will keep informed of any developments.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
	Extension update 4/4/23, 14/4/23, 23/8/23 Meeting held 23/08/23		
Lot 500 – Hopelands Road		In progress to ascertain contact details.	
Lot 70 – Hopelands Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call 21/08/23	No residence Phone conversation, provided update on Lot 63 and the western extension.	Will keep informed of any developments.
Lot 71 – Hopelands Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23	No residence. Discussions have been around exploration access for neighbouring property.	Will keep informed of any developments.
Lot 56 – Westcott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Various meetings. Phone call 23/08/23	Under Agreement, ongoing engagement. Concerns raised in regard to Doral owned Lot 212 and existing lease arrangement as currently leases from previous owner.	Continue to work with landholder in regard to lease arrangement.
Lot 4 – Westcott Road	Receives regular site update letters.	Under agreement for proposed mining for Lot 56. Ongoing engagement. Concerns raised in regard to dust and noise in regard to mining on Lot 56.	Advised same mitigation measures for current operations will be implemented and commitment to further discussion and collaborative approach.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
	Extension update 4/4/23, 14/4/23, 23/8/23 Various meetings.		Further discussion required for amenity agreement for western extension
Residents south of Readheads Road	Contact details to be obtained and is in progress.		Intention is to have those within close proximity to be under agreement, consultation in progress.
NEAR NEIGHBOURS			
Lot 1 – Elliott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Meeting in April 2023 with Environment Manager Phone call 14/08/23	Receives all site update letters, involved in site native revegetation program and in contact with Doral team. Dust and operational impact on water table is primary concern.	Various meetings to run through annual water monitoring data. Participates in the community bore monitoring program, bore is tested every quarter. Advised noise not an issue.
Lot 501 – Elliott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call 16/08/23	Receives all site community update letters, issued quarterly. Primarily noise, can sometimes hear loader at night, not constant. Concerns around clearing of native vegetation.	Feedback noted. Aware of sites native revegetation program.
Lot 508 – St Blaise Grove	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23	No issues. Receives all site community update letters, issued quarterly.	Will keep informed of any developments.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
	Phone call 16/08/23, received text		
Lot 13 and 14 – Westcott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone call and email, 16/08/23	No issues. Receives all site community update letters, issued quarterly. Have met previously through discussions regarding mine access to Lot 56.	Will keep informed of any developments.
Lot 54 – Westcott Road	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Phone conversation 7/08/23	No issues. Receives all site community update letters, issued quarterly. Various meetings over the years. Advised mining for Lot 56 is delayed and advised plans for Western Extension.	No issues in regard to Western Extension. Advised we would keep them informed as to any plans in regard to Lot 56, which is closer to their residence than the Western Extension.
OTHER STAKEHOLDERS			
Local MP Robyn Clarke MLA	Receives regular site update letters. Extension update 4/4/23, 14/4/23, 23/8/23 Email: 21/08/23	No issues, supportive of Company's community funding program.	Annual meeting requested for late 2023.
Local MP Hugh Jones MLA	Receives regular site update letters. Extension update 4/4/23, 14/4/23 23/8/23 Email: 21/08/23	No issues, supportive of Company's community funding program.	Annual meeting requested for late 2023.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
CY O'Connor Research Facility	26 July 2023	Presentation to Group on western extension. Questions in regard to mine life, water allocation, rehabilitation techniques.	Advised of monthly water monitoring and reporting process and rehabilitation commitments. Offered site tour for those interested.
North Dandalup and Keysbrook Volunteer Bushfire Brigades	Annually, every October	An annual site visit by the Groups to ensure members are provided with the latest information in regard to its operations and identify and confirm the site's ability to respond to emergency situations.	Any corrective actions or suggestions will be implemented as identified.
COMMUNICATIONS			
Western Extension letter, sent to closest neighbours for western extension.	Dated 4 April 2023. Sent to 44 neighbours.	Detailed letter outlining environmental measures and operating details associated with the Western Extension.	No phone calls or feedback received on receipt of letter.
Keysbrook site updates, sent to all on community database.	Dated 14 April 2023. Sent to 85 neighbours, close and interested neighbours.	Western Extension update. Community update letters are sent approximately every 8 – 12 weeks and have been sent to nearest neighbours since 2012.	No phone calls or feedback received on receipt of letter.
Keysbrook site updates, sent to all on community database.	Dated 23 August 2023. Sent to 85 neighbours, close and interested neighbours.	Western Extension update. Community update letters are sent approximately every 8 – 12 weeks and have been sent to nearest neighbours since 2012.	No phone calls or feedback received on receipt of letter.
Keysbrook Community Consultative Group (CCG),	2 May 2023 2 August 2023 Next: 1 November 2023	Both meetings focused on the western extension and current timings, community consultation, approvals process. Queries were based	Continue to keep informed of developments, timings and any community concerns raised during the consultation period.

STAKEHOLDER	DATE	ISSUES/TOPICS RAISED	PROPONENT RESPONSE/OUTCOME
meeting since 2012		on mine life, future deposits, ongoing employment and crossing of Elliott Road.	Minutes are made available on the Doral website.
Annual Newsletter	Planned for October 2023	To include details of western extension.	

5. CHANGES TO AN EMP

TABLE 13: CHANGES TO EMP

COMPLEXITY OF CHANGES		MINOR REVISIONS ✓	MODERATE REVISIONS	MAJOR REVISIONS
NUMBER OF KEY ENVIRONMENTAL FACTORS		One ✓	2-3	>3
DATE REVISION SUBMITTED TO EPA		Aug 2023		
PROPONENT'S OPERATIONAL REQUIREMENT TIMEFRAME FOR APPROVAL OF REVISION		<1 month	<6 months	>6 months✓
ITEM NO.	EMP SECTION NO.	EMP PAGE NO.	SUMMARY OF CHANGE	REASON FOR CHANGE
1	1. Content Scope and Rationale	1	Updated to include proposed S.40AA details for Amendment Area (Western Extension)	Update EMP to include proposed Amendment Area to support submission of S.40AA
2	1.4 Rationale and Approach	40-50	Inclusion of additional weed and dieback surveys for proposed S.40AA	New information included relevant to proposed Amendment Area (S.40AA).
3	5. Changes to EMP	51	Table of Changes to EMP	As required by EMP guidance

6. REFERENCES

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FIGURE 1: SITE LOCATION

396000 399000 402000

N

0 250 500 750 1,000 1,250
Meters

6411000 6408000 6405000 6402000

Lot 2 Lot 66 DIRK BROOK Lot 54 Lot 1 DIRK RD
Lot 67 Lot 4964
Lot 1 MYARA BROOK
Lot 7 Lot 8
Offset Area Lot 202
Lot 507 Lot 508 Lot 201 Lot 56
Lot 2
WESCOTT RD Lot 5 Lot 9 Lot 11 Lot 12 BADEN RD
ELLIOTT RD
Lot 4965
Lot 20 Lot 12
Lot 57 Lot 1
Lot 64
Lot 701
Lot 700
Lot 52
Lot 105 Lot 101 Lot 111 Lot 105 Lot 50 Lot 1
Lot 103 Lot 104 PAGE RD
Lot 63 Lot 112 Lot 104
HOPELAND RD
Lot 70
Lot 6 Lot 1
Lot 113 Lot 103
Lot 62
Lot 59 Lot 300 Lot 301 ATKINS RD
Offset Area Lot202
Lot 71
Lot 20 Lot 506 Lot 505
Lot 1 Lot 101 Lot 100
Lot 5
Lot 12 Lot 102
WESTCOTT RD ST BLAZE GR
Lot 110
READHEADS RD
MCMAHON RD
BEAU SOVEREIGN CT
JENNIE PL
SOUTH WESTERN HWY

Legend

Ministerial Statement 810
- Development Envelope
- Approved Mining Area
- Lot 202 Offset Area
- Lot 62 Offset Area

Section 40AA Request
- Proposed Development Envelope
- Proposed Mining Area

Section 45C Request
- Amendment Area

Regional Cadastre
- Regional Cadastre

Doral

Keysbrook Mineral Sands Project

S40AA Request – Proposal Area

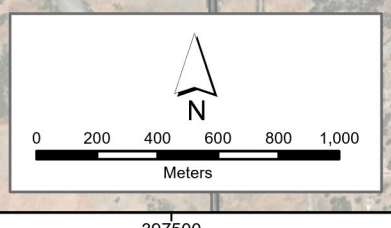
Scale	Datum: GDA2020	Sheet Size A3
1:30,000	Projection: MGA Zone 50	
Figure: 2-2		14/08/2023

FIGURE 2: CONCEPTUAL REVEGETATION PLAN

397500 399000 400500 402000 403500

6412500 6411000 6409500 6408000 6406500 6405000 6403500

Lot 501 Lot 2 Lot 66 Lot 4 Lot 54
Lot 4964
Lot 67
Lot 1
Lot 7
Lot 2
Lot 507 Lot 508 Lot 201 Lot 202
Lot 56
Lot 5 Lot 9 Lot 11 Lot 12
Lot 4965 Lot 3
Lot 12
Lot 64
Lot 57
Lot 1
Lot 701
Lot 52
Lot 700
Lot 50
Lot 105 Lot 101
Lot 111
Lot 105
Lot 1
Lot 103 Lot 104
Lot 2
Lot 112
Lot 104
Lot 70
Lot 63
Lot 6
Lot 113
Lot 1
Lot 103
Lot 71
Lot 62
Lot 59
Lot 300
Lot 301
Lot 20
Lot 1
Lot 506 Lot 505
Lot 100
Lot 212 Lot 211
Lot 507 Lot 504
Lot 310
Lot 213
Lot 101
Lot 5
Lot 101
Lot 309
Lot 12
Lot 102
Lot 508 Lot 503
Lot 11
Lot 110
Lot 3
Lot 509
Lot 6 Lot 3
Lot 4696
Lot 81 Lot 94
Lot 9506 Lot 82 Lot 95 Lot 93
Lot 55
Lot 54
Lot 53



Legend

- Development Envelope
- Covenant Areas
- Approved Mining Area

EPBC2023/09718 / Section 40AA Request

- Proposed Project Area
- Proposed Mining Area

Proposed Amendment Area

- Amendment Area

Conceptual Revegetation Areas

- Revegetation Areas

Doral

Western Extension to Keysbrook Mineral Sands Project

Conceptual Revegetation Areas

Scale	Datum: GDA2020	Sheet Size A3
1:25,000	Projection: MGA Zone 50	
Figure: 8-2		30/04/2024

APPENDIX 1: SPECIES LIST

Upland – dryer areas	
Acacia extensa *Acacia Pulchella* *Adenanthos meisneri* *Allocasuarina fraseriana %* *Allocasuarina humilis %* *Banksia attenuata %* *Banksia Grandis %*	*Calothamnus quadrifidus* *Corymbia calophylla* *Eucalyptus marginata %* *Gastrolobium capitatum* *Hibbertia hypericoides* *Jacksonia sternbergiana* *Kunzea glabrescens*
Lowland (mid)	
Acacia extensa *Acacia Saligna* *Anigozanthos manglesii* *Corymbia calophylla* *Hakea lissocarpha,* *Hakea prostrata %*	*Hakea varia* *Kunzea glabrescens* *Kunzea recurve* *Melaleuca laterita* *Melaleuca thymoides*
Riparian (Creek and flood plain)	
Astartea scoparia *Eucalyptus Rudis* *Hypocalymma angustifolium,* *Juncus Pallidus* *Juncus subsecundus*	*Melaleuca preissiana* *Melaleuca raphiophylla* *Melaleuca viminea* *Pultenaea reticulata* *Regelia ciliata/inops*
% - dieback susceptible	

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