

Extractive Industries Licence Application and Environmental Management Plan

2038 Donnybrook Boyup Brook Road Yabberup,
Shire of Donnybrook–Balingup



REPORT PREPARED BY
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2038 Donnybrook Boyup Brook Road Yabberup, Shire of Donnybrook- Balingup

Extractive Industries Licence Application and Environmental Management Plan

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Front cover image: *Landgate Image of the proposed extraction areas, January 2017*

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1 INTRODUCTION

The purpose of this report is to provide all the necessary information required in support of an Extractive Industries Licence (EIL) application and a Development Approval (DA) application (Appendix 1) by the proponent, Westwall Holdings, in relation to proposed gravel extraction at 2038 Donnybrook Boyup Brook Road Yabberup, Shire of Donnybrook-Balingup.

This application is for extraction of gravel within a total area of 16.4ha, which is divided into four stages. This report sets out the details required by the Shire of Donnybrook-Balingup for the extraction of laterite gravel on the property together with maps. It also provides an environmental assessment of the proposal and environmental management plans.

The landowner has provided Westwall Holdings with consent to the project (Appendix 2).

2 PROPERTY DESCRIPTION, OWNERSHIP AND LOCALITY

The property is situated approximately 18km from the intersection of Donnybrook Boyup Brook Road and South-western Highway. A locality plan is included as Figure 1. The property description and ownership are summarised in Table 1.

Table 1. Property description

Property Description:	2038 Donnybrook Boyup Brook Road Yabberup Shire of Donnybrook-Balingup
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Lot 3671:

Deposited Plan	251784
Volume	2123
Folio	348
Area:	37.5662ha
Ownership	Old Valley PTY LTD

Lot 130:

Deposited Plan	301904
Volume	2123
Folio	349
Area:	34.3454
Ownership	Old Valley PTY LTD

The properties intersect pending Exploration Licence 70/5871 applied by Preston River Lithium Pty Ltd), however surface rights would not be affected, so the tenement holder will not have access to surface resources such as basic raw materials.

3 DESCRIPTION OF THE SITE AND ITS SURROUNDS

3.1 PRESENT LAND USE

The property is currently used as a vineyard. The extraction area will be rehabilitated back to pastures after completion of operations.

Figure 2 illustrates the land use of the property and its immediate surrounds

3.2 TOPOGRAPHY

The elevation of the subject areas ranges between 125mAHD and 156mAHD and generally falls towards the north, north-east and north-west.

Current slopes across the proposed EIL areas range between approximately 1:18 (5.7%) and 1:9 (11%).

3.3 SURFACE WATER, DRAINAGE AND WETLANDS

The property is not situated within a *Rights in Water Irrigation Act 1914* (RIWI) Surface Water Proclamation Area.

The Preston River is approximately 560m north of the closest boundary of the proposed extraction area. Preston River tributaries flowing from the south, are adjoining the proposed extraction area on the west and east at approximately 40m and 122m respectively. The tributaries flow through the farm dams, as shown in Figure 2 (Landgate, 2022).

The tributary flowing on the west of the proposed operation will be protected by the proposed operation by the mechanism of a 40m buffer between the tributary and the proposed area.

The site is located within the Leschenault Estuary – Preston River Catchment within the upper Preston sub catchment.

There are no wetlands present within 1.5km of the proposed extraction areas.

The site does not fall in a Public Drinking Water Source Area (Landgate, 2022).

Details of the methods that will be used to manage stormwater and off-site sedimentation are discussed in Section 5.5 of this report.

3.4 GEOLOGY AND SOILS

The underlying geology is metamorphic/granitic rocks of the Yilgarin craton. In places, weathered granitic materials are overlain by ferruginous duricrust/laterite, which is massive to rubbly and includes iron-cemented and reworked products ((GeoVIEW, 2022), (Dawe, 1998), (EPP, 2014)).

The soil profile comprises a thin layer of gravelly sand which overlies a gravelly loam which grades into laterite boulders and gravel.

The excavation depth would be one metre below current ground level.

3.5 GROUNDWATER HYDROLOGY

Due to presence of granitic material and rocks in the shallow subsurface, ground water occurrence is limited to localized small aquifers associated with deeper accumulations of sandy materials or in fractured rock aquifers. Water table is approximately 20m deep but is limited due to the impervious nature of the rock.

The Site is not situated within a *Rights in Water Irrigation Act 1914*(RIWI) Groundwater Proclamation Area (Landgate, 2022).

3.6 VEGETATION AND FAUNA

There will be no clearing of native vegetation, since the entire area proposed for gravel extraction is currently planted to grapes. There is a line of native vegetation along the west and the east, and a patch of trees on the south-east of the proposed extraction area, which will be not disturbed and are protected by a buffer of 10m from the extractive activities.

There is a small patch of trees between the Stage 3 and 4, and another patch on the north-east of the proposed extraction area, which does not fall into native vegetation, yet will not be removed or be disturbed by the proposed operations.

The surrounding native vegetation type is categorized as Queenwood and Balingup Vegetation Complex (Landgate, 2022). Species present in these areas are *Eucalyptus marginata*, *Corymbia calophylla* and *Eucalyptus wandoo* (Beard, 2005).

No Threatened species listed under the EPBC Act or gazetted as Declared Rare Flora (Threatened) pursuant to the BC Act were observed in the proposed extraction area.

No Threatened or Priority Ecological Communities are present in the proposed extraction Area.

3.7 ENVIRONMENTALLY SENSITIVE AREAS

An Environmentally Sensitive Area (ESA) is an area where the vegetation has high conservation value and cannot be cleared. ESAs are declared by the Minister in the Environmental Protection (Environmentally Sensitive Areas) Notice 55 (2005) under section 51B of the Environmental Protection Act 1986. There are no Environmentally Sensitive Areas (ESA) as defined by the Clearing Regulations (DWER, 2019a) within or adjacent to the proposed EIL area.

3.8 CURRENT ZONING AND EXISTING INFRASTRUCTURE

Lots 130 and 3671 are zoned as "Priority Agriculture", in terms of the Shire of Donnybrook-Balingup Local Planning Scheme No.7 (DPLH, 2022).

3.9 BUSHFIRE PRONE AREAS

One-third of the proposed extraction area, the western boundary, and the eastern boundary falls within a bushfire prone area as designated by the Fire and Emergency Services (FES) Commissioner on 1 June 2018. However, the threat of bushfire from this operation is considered low, since the proposed extraction will be on cleared agricultural land and the pit area is not prone to fire.

3.10 CLOSEST RESIDENCES

The EPA draft Environmental Assessment Guidelines “Separation distances between Industrial and sensitive land uses” lists the generic buffer for extractive industries where “grinding and milling works but no blasting” are proposed as 500-1,000m, depending on the type of processing (EPA, 2015). The operation is considered “low scale”, since only up to 5ha of area will be disturbed at a time; 500m buffer would be adequate.

The closest structures to the outer boundaries of the extraction area are identified on Figure 2. There are five structures, excluding the owner’s shed, which is not residential, located within 1km of the proposed extraction areas, as shown in Table 2.

Table 2. Structures Within 1km Radius of Proposed Extraction Area

Reference No. on Figure 2	Lot no.	Distance to closest area of pit (metres)
Structure 1	144	502N
Structure 2	3594	524N
Structure 3	6	569N
Structure 4	143	867 NW
Structure 5	1	894 S
Owner’s Shed	2064	633W

There are no structures within 500m of the closest boundary of the operation area. The nearest structure S1 is 502m north of the closest boundary of Stage 4. The native vegetation is well established, along the Donnybrook Boyup Brook Road, will act as a buffer between the extractive industry activities and the sensitive receptors.

4 THE DEVELOPMENT PROPOSAL

4.1 PREVIOUS GRAVEL EXTRACTION

No previous commercial lateritic gravel extraction has occurred on the property.

4.2 PROPOSED GRAVEL EXTRACTION

Westwall Holdings intends to extract approximately 59,040 tonnes/year of gravel from the areas indicated on Figure 2 in Stages 1, 2, 3 and 4, Stage 1 of 4ha, Stage 2 and 3 of 4.6ha and Stage 4 of 3.1ha. The total area to be disturbed is approximately 16.4ha and excavation will proceed to a depth of approximately one metre. The EIL application is for 5 years.

The proposed new extraction licence is required, for the purpose of undertaking the following activities on the land:

- The proposed extraction area will be cleared of vine plantation in stages, with only the stage being worked on, being cleared, ensuring the disturbed area exposed at any time to a practical minimum.
- Extraction of gravel from an area of 16.4ha in four stages as shown in Figure 3. Stages 1, 2, 3 and 4 will involve extraction of 295,200 tonnes of gravel in total but will be dependent on demand.
- Topsoil will be removed from the extraction area prior to the commencement of each stage, with only the area targeted for immediate extraction being open. Topsoil will be stockpiled separately along the edges of the extraction area, with stockpiles being no more than 2m high and 12m wide, with batter of 1:3 metres.
- Within each current stage of extraction, a bulldozer will rip and blade material to a raw material stockpile. This material is loaded into the crusher after which stacker creates a product stockpile. The product stockpile will be no more than 9m high and 50m wide, with batter of 1:3 metres.
- A mobile crushing and screening plant will process the material for approximately three to four weeks per year on site. Trucks will enter the pit and be loaded from the stockpile by a front-end loader.
- Product stockpiles will be placed in such a way, that they will act as a noise buffer between the crusher and the sensitive receptors.
- Crusher and stockpile positions have been identified for each stage and are illustrated in Figure 3.
- Extraction activity will result in the lowering of the ground level by approximately one metre.
- At a time, only one stage of up to 5ha will be extracted and will be progressively rehabilitated back to pasture after completion of extraction activities and before moving to the next stage. This will ensure that the area of disturbed land is stabilized, and the disturbed area exposed at any time is kept to a practical minimum.
- Trucks will enter the pit via an existing gravel access road off Donnybrook Boyup Brook Road and be loaded from the stockpile by a front-end loader.
- Measures to limit noise and dust from the operations are discussed separately in 5.6 and 5.7 below.

- Rehabilitation and stormwater management measures will be implemented.
- There will be no blasting in this operation.
- The lot boundary buffer of 20m will apply. However, the proposed extraction will excavate through the boundary between Lot 130 and 3671, thus avoiding the batter on both sides and an elevated boundary line.
- Batters of 1:6 metres will be maintained throughout the operation. Where possible, topsoil will be replaced and seeded with pastures on a progressive basis, in fully extracted areas, prior to the commencement of winter.

Table 3 below summarises the actions that are to take place on the property over the next 5-year licence period (2022 to 2027).

Table 3. Proposed Stages of Extraction

Stage	Action	2023	2024	2025	2026	2027	2028	2029	
1	Strip, crush and stockpile	█							
1	Load and truck out		█						
1	Progressive rehabilitation of 4ha		█						
2	Strip, crush and stockpile		█						
2	Load and truck out			█					
2	Progressive rehabilitation of 4.6ha			█					
3	Strip, crush and stockpile			█					
3	Load and truck out				█				
3	Progressive rehabilitation of 4.6ha				█				
4	Strip, crush and stockpile				█				
4	Load and truck out					█			
4	Progressive rehabilitation of 3.1ha					█			
1-4	Monitoring and Maintenance		█						

4.3 SITE ACCESS AND EGRESS ROADS

Site access and egress is well established from Donnybrook Boyup Brook Road (Figure 2). The driveway will be upgraded to include bitumen sealing the first 30m, as per MRWA and Shire specifications.

4.4 SCHOOL BUS SCHEDULE

To incorporate the school bus hours, there will be curfew on truck movements to and from the pit, the curfew will be between 0715 and 0855 in the morning, and between 1505 to 1635 in the afternoon, on school days.

4.5 ESTIMATED TRAFFIC TO BE GENERATED

Operating times will be 7 am to 7 pm Monday to Friday and 7 am to 4 pm on Saturdays, excluding public holidays.

The following estimates are made:

Estimated annual gravel removal:	59,040 tonnes
Number of working days per month:	22days
Vehicle payloads (GAV's ¹):	Standard rigid truck (14 tonnes) Single Semi-loader (24 tonnes)
Proportional use:	14 tonner (50%), 24 tonners (50%)

The above estimates suggest a maximum of 13 truck trips (in total) per day, but this will be dependent on demand.

¹ General Access Vehicle (in terms of Road Traffic Rules and Regulations 2002)

5 POTENTIAL NEGATIVE ENVIRONMENTAL IMPACTS AND PROPOSED MANAGEMENT

Short-term negative environmental impacts are to be expected in the process of all mining actions. These can largely be mitigated over the medium to long term provided that operating procedures are in accordance with acceptable standards and that rehabilitation measures are implemented as proposed. The following listed potential impacts are used as a checklist to ensure that all potential major impacts are addressed.

5.1 FLORA AND FAUNA

There will be no clearing of native vegetation since the entire area proposed for gravel extraction is currently planted to grapes. Therefore, it is unlikely there will be significant impact to indigenous flora and fauna. The native vegetation existing nearby the proposed extraction area will be not disturbed and will be protected by a buffer of 10m from the extractive activities.

5.2 WEEDS

Westwall Holdings will implement a weed management plan as is described in Appendix 3 of this report.

5.3 ALTERATION OF THE LAND SURFACE

After extraction, the land surface will be approximately one metre lower than the original and with the batters of 1:6, and surface smoothing the change will be imperceptible.

5.4 VISUAL IMPACT

Whilst a short-term visual impact will occur, once rehabilitation has been completed and pastures regrown, there will be little evidence that extraction has taken place. The visual impact from the Donnybrook Boyup Brook Road will be significantly reduced by the presence of a line of trees which exist between the residences on the northern side of the road. In addition, the operation is short term, and the land will be rehabilitated relatively quickly behind the extraction phase.

5.5 WATER

In all mining operations the potential exists for impacts to be incurred on surrounding water resources, or by storm water erosion of exposed areas. This is dependent on the slopes associated with the site, the nature of the ground materials and the proximity of the site to sensitive receptors such as productive aquifers, wetlands, lakes, or rivers.

A Water Management Plan has been prepared and is included as Appendix 4 of this report.

5.5.1 Water Management

5.5.1.1 Surface Water Management

Surface drainage within the proposed EIL area is generally towards the north into the Preston River. There are minor drainage lines existing to the east and west of the proposed area (Figure 2). Two nearest dams are at, 40m W and 130m SE of the EIL area. The dams will not be directly impacted by sedimentation, as the drainage is towards the north of the extraction area, towards Preston River. As a precaution, a 40m buffer has been applied between all watercourses and proposed extractive activities.

The proposed extraction site does not include any expressions of surface water such as lakes, wetlands, dams, rivers or creeks, and no major surface drainage lines have been identified within the proposed extraction areas.

5.5.1.2 Stormwater Management

Stormwater management is an important issue on this site and the management measures proposed are as follows:

- Any surface runoff from unmined areas outside the EIL area will be diverted around the workings by means of stockpiles and diversion bunds placed around the boundaries of the operational stage.
- The runoff generated by direct rainfall onto the working stage will be managed using a number of measures which include:
 - Stormwater detention ponds to be constructed at the base of each stage whilst it is being worked, with all stormwater generated by rainfall onto the active cell being directed to them by the use of rip lines and material stockpiles. Detention ponds will serve as effective silt traps in times of high surface runoff. Runoff and detention pond sizing is calculated in the Water Management Plan (Appendix 4).
 - Strategically placed stockpiles to reduce water flow within the extraction area.
 - Topsoil stockpile will be positioned in a gently sloped area along the stage boundary, and it will stabilise quickly, which will prevent any sedimentation.
 - Product (gravel) stockpile will act as a barrier to the storm water flow, and any water escaping will be captured by the constructed detention ponds.
- On completion of the extraction stage, contour banks will be constructed with an average fall of 0.2% and within a range of 0.1 and 0.4%. The contour bunds will be spaced according to contour design guidelines (See Water Management Plan in Appendix 4).

5.5.1.3 Groundwater Management

Due to presence of granitic material or rocks in the shallow subsurface, ground water occurrence is limited to localized small aquifers associated with deeper accumulations of sandy materials.

The project does not involve abstracting groundwater for operational purposes. No groundwater will be exposed by this development since extraction will only lower the ground level by one metre.

Due to the low scale nature of the operations, no groundwater contamination is anticipated. No fuel or lubricant storage will occur on the site.

Refuelling will take place using a mobile refuelling vehicle which is equipped with a “snap-on snap-off, fast-fill and auto shut-off” facility. Plant will be refuelled each morning, leaving the vehicles almost empty overnight.

Refuelling or any activities that carry a risk of spills will be carried away from the detention basins and stormwater flow paths. No major servicing, which could lead to fuel and oil spills, will take place on the site. Contaminated material resulting from any minor spills will be extracted and disposed of offsite at an appropriate landfill facility.

Westwall Holdings will implement a Hydrocarbon Spill Response outlining their procedures for controlling, recovering, treating, and reporting hydrocarbon spills (See Water Management Plan in Appendix 4).

5.6 NOISE

An assessment of noise emissions from the proposed gravel extraction operations was undertaken by Herring Storer Acoustics (Attached as annexure with Appendix 5). The noise modelling estimated the sound levels which may be incurred from the operation under worst-case conditions. The modelling is not an average of the likely noise to occur at each residence but a process to determine whether the operation will always comply with the Environmental Protection (Noise) Regulations 1997.

As detailed in Section 3.10 and Appendix 5 there are five residential dwellings within 1,000m of the proposed operations, located mostly towards the north. The nearest residence is located 502m to the north. The proposed crusher locations are shown on Figure 3.

At the neighbouring residences, the applicable acoustic criterion for the assessment is the assigned L_{A10} daytime noise level of 45dB(A).

Noise received at the nearest residential premises has the potential to exceed the assigned noise level criteria by up to 5dB if no noise control in the form of earthen bunding is implemented.

Therefore, to comply with the criteria, management of the dozer and fixed plant noise levels requires operations behind a barrier (earth bund) for strategic locations throughout the staging. Given these operating parameters, noise levels received at the nearest premises has been calculated to comply with the Environmental protection (Noise) Regulations 1997 (discussed further in Appendix 5).

5.6.1 Noise Management

Westwall Holdings will apply the following noise management practices for the proposed operations:

- Product stockpile noise bunds will be constructed for crusher locations as recommended by Herring Storer Acoustics.
- Bunds will be created with existing gravel product on site and a soil binding agent will be utilised (if necessary) to stabilise the bunding, which will be maintained until operations at that location cease.
- Topsoil will be stockpiled along the edges of the extraction area, to a maximum height of 2m, and overburden stockpile will be placed in front of the crusher, to act as noise barrier between the crusher and sensitive receptors, to give the greatest noise attenuation benefits.
- All plant will be maintained in good condition with efficient mufflers and noise shielding.
- Mobile equipment will be fitted with broadband reversing alarms.
- A contact number for complaints will be advertised on the site notice board at the entrance to the property, and a complaints system will be in place with any complaints recorded by the Operations Manager and acted on promptly.

5.7 DUST

There is potential for dust to be generated when conditions are dry and there are strong winds during the initial stages of the proposed operation. Proposed measures to limit the impact of dust are contained in a Dust Management Plan included as Appendix 6.

5.7.1 Dust Management

The potential dust generating activities associated with the proposed development and the measures that are proposed to manage dust impacts are listed below:

- A 15kl water cart will be on site during all periods when earth is being moved. If and when dust is caused to occur during these periods, the water cart will be employed to damp down the areas of concern.
- Stockpiling activities will be in topographic low points with raw and processed stockpiles arranged such that windbreaks are created to further prevent impacts from fugitive dust.
- A polymer-based spray-on soil stabilizer will be applied to topsoil and overburden stockpiles if they do not stabilize by crusting and grass re-growth.
- Truck loads will always be covered so that no dust is generated in transit.
- A notice will be erected at the front gate, and this will provide emergency contact details for the Quarry Manager.
- A complaints register will be used, with all complaints being formally recorded.

5.8 DIEBACK

5.8.1 Potential Impacts

Previous assessment of the dieback status of the site could not be ascertained due to the historical clearing that had occurred on site. These areas should thus be classified as “uninterpretable” and managed as per the guidelines applicable for this classification (Dieback Working Group, 2010). Westwall Holdings Pty Ltd has prepared a brochure for management of dieback which is included as Appendix 8.

5.8.2 Dieback Management

The following management measures will be put in place to minimise future spread of dieback:

- The properties will be always fenced.
- Access to the properties will be via a single entrance gate.
- All machinery, trucks and other vehicles will arrive in a clean condition free of soil and organic matter that may contain dieback fungus.
- Any soil and plant material brought to the site for rehabilitation purposes should be from dieback free sources.
- Employees and contractors working on the site will be informed of the purpose of the above measures and their responsibilities in relation to dieback prevention.

- The site will not be worked during wet periods.

5.9 HERITAGE SITES

A search of the Department of Planning, Lands and Heritage (DPLH) Aboriginal Heritage Inquiry System (AHIS) shows one registered site which is the Preston River Site 19795, classified as a mythological site ((Department of Planning, Lands and Heritage) DPLH, 2022). However, the site is 40m west from the nearest western stage, and 122m east from the nearest eastern stage. The site will not be disturbed or impacted by the operations.

There are no other registered or heritage sites within the proposed extraction area. If during the works, an Aboriginal cultural heritage site is discovered, the Proponent will immediately advise the DPLH and abide by the *Aboriginal Heritage Act 1972*.

5.10 ACID SULFATE SOILS

A search of the CSIRO's Australian Soil Resource Information System (ASRIS) database identified the area has been provisionally classified as having an extremely low probability with very low confidence of occurrence for acid sulfate soils (CSIRO, 2022).

5.11 FIRE MANAGEMENT

Fire management will be implemented in accordance with Shire of Donnybrook-Balingup's Local Planning Scheme 7.

5.11.1 Fire Risk

The rainfall pattern for the area is such that the majority of the rain falls in late autumn to early spring. This rainfall supports substantial vegetation growth which dries off in summer/early autumn.

Bush fires in the area are generally fast moving, with many fires running up the trees into the canopy, sending out embers to start spot fires ahead of the main ground fire, making suppression and containment difficult. Smoke is a major hindrance to fire fighters in such fast-moving fires.

Fire risk assessment for the proposed development will consider existing site conditions (WA Planning Commission & FESA 2010), which include:

- Topography and slope with reference to accessibility
- Remnant vegetation cover and likely revegetation
- Surrounding land use patterns

The bush fire risk level for the proposed development area is Low-Medium, as the area will be cleared of the vineyards before commencement of extractive operation. The bush fire risk levels for the surrounding remnant vegetation are rated as Extreme and Low-Medium in cleared areas.

5.11.2 Water Supplies

As per condition 4.41.3 of Local Planning Scheme 7, a water tanker is available for firefighting operations off site when bush fires are close by, and water availability is at the discretion of Westwall holdings management. Water will be available from the constructed detention pond, as well as existing farm dams. A 15kl water cart will be always on site.

5.11.3 Contacts

The Site Supervisor will be the main point of contact for any fire related queries. The Supervisor's contact number will be displayed on the sign at the main access gate.

5.11.4 Actions in the Event of a Bush Fire on Site

The following actions will be taken in the event of a bush fire.

- All personnel on site will be notified immediately of fire.
- Fire will be reported to FESA Operations by ringing '000' and providing all known details on the fire including location, type of vegetation burning, intensity, smoke level.
- If safe to do so, onsite personnel and equipment will be used to extinguish the fire using fire extinguishers, water cart, plant, and equipment.
- Personnel and equipment will be relocated to a safe area.
- A fire break will be created around the fire, if possible, only if it is safe to do so. Any personnel or equipment will not be put at risk.
- On arrival of Fire Brigade, site supervisor will take directions from the most senior Brigade Officer (Incident Controller) on site. Westwall Holding personnel will follow their own chain of command (site supervisor/team leader).
- Mobile phones will be available to all operators.
- Fire extinguishers will be fitted to all plant and a mobile fire fighting unit will be available on site.
- Operations will cease during a fire ban or harvest ban.
- The water cart will be fitted with a fire hose facility.

6 REHABILITATION

6.1 PROPOSED REHABILITATION MEASURES

Rehabilitation of the completed areas will be progressive with the entire area being returned to pastures. A Pit Rehabilitation and Maintenance Management Plan is included as Appendix 7.

The following steps will be implemented:

- All batters behind the active working face will be contoured to achieve a slope of no more than 1:6.
- Final land surface will have the same grade as the original surface but will be approximately one metre lower.
- Stockpiled topsoil/overburden will be re-spread over completed area.
- The pit floor will be ripped along the contour, at 6m intervals, to a depth of 0.5 to 1m to relieve compaction, improve infiltration, attenuate stormwater runoff, and facilitate rapid root penetration.
- Stormwater attenuation embankments will be constructed as discussed in Section 5.5.1.2 above.
- All areas will be seeded with appropriate pasture species.
- Rehabilitation work will only be carried out just prior to or during the wet season.
- Regular monitoring will be undertaken over the licence period as is described in Section 6.3 below.

6.2 MONITORING AND MAINTENANCE

Monitoring of rehabilitated areas will ensure that any area requiring remedial work is identified. Monitoring will be carried out on an annual basis to assess:

- The physical stability of the landform in the rehabilitated area.
- The success of sown pasture grasses.
- The emergence of weeds.

Monitoring will continue until the completion criteria presented in Section 6.3 have been fulfilled. Maintenance procedures will be carried out where necessary and will include:

- Repair of any erosion damage.
- Seeding areas that may not have regenerated.
- Weed control.

6.3 COMPLETION CRITERIA

Completion criteria should be set at a high enough standard to ensure that the overall objectives of the rehabilitation have been met. These criteria should allow for efficient reporting and auditing so that rehabilitation works can be tracked and finalised within an appropriate timeframe.

The completion criteria proposed for extractive operations on Lots 130 and 3671 are presented in Table 4.

Table 4. Closure Criteria, Objectives and Interim Targets

Criteria	Objective	Interim Targets
a) Safety	The site is safe to humans.	Site is safe to humans during operations.
b) Sustainability	The site is sustainable in the long term without additional management inputs.	On-going Management of short-term impacts.
c) Suitability	The site is suitable for the agreed land uses.	On-going Management of short-term impacts.
d) Visual amenity and heritage	The rehabilitated extraction area blends into the surrounding environment.	On-going Management of short-term impacts.
e) Off-site impacts	Significant adverse off-site impacts are prevented.	Significant adverse off-site impacts are prevented.
f) Hydrology	a. Site hydrology does not prevent the establishment of desired vegetation.	Stormwater is contained within the site during operations.
	b. Site hydrology does not reduce the stability of the landform.	Identification and mitigation of any hydrology related issues during operations.
	c. Stormwater is contained within the site.	
g) Soils and stability	a. Soil profiles and structures are sufficient to ensure vegetation establishment.	Topsoil is respread in all rehabilitation areas.
	b. The landform is stable.	Identification and mitigation of potential erosion scars and scours during operations.
h) Vegetation	a. Pasture grasses cover the entire site after completion of the extraction phase.	After one year pasture grasses over 30% of target area increasing by 20% per annum thereafter.
	b. Pasture grass cover is sufficiently resilient to sustain grazing pressure.	
i) Weeds	a. Declared pest weeds are absent.	Declared weed species removed systematically during operations.
	b. The level of weed species should not be detrimental to the planted seedlings.	

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