Rehabilitation Plan

10.1 Introduction

The Mineral Resources (Sustainable Development) Act 1990 requires mining license holders to develop a rehabilitation plan as part of the Work Plan Variation. Guidance is provided in Rehabilitation plans and other environmental aspects of work plans (see Section 3.4.4). This section of the EES outlines those concepts that will be adopted in the Rehabilitation Plan for the Project.

This section of the EES is based on information presented in:

- Outback Ecology (MWH Australia Pty Ltd) (2014), Rehabilitation Plan for the Big Hill Enhanced Development Project, prepared for URS Australia Pty Ltd.

This report is included in Technical Appendix 19.

Relevant sections of EES Scoping Requirements

This section of the EES addresses the following sections of the Scoping Requirements.

4.4 Landscape, Visual and Recreational Values

Evaluation Objective

To minimise adverse effects on landscape, visual amenity and recreational values associated with Big Hill and environs.

4.5 Health and Social Impacts

Evaluation Objective

To protect the health, safety and wellbeing of residents and the social fabric of the community in the area in the context of project hazards.

Key issues emerging from EES studies and community consultation:

The EES Scoping Requirements outlined above provide a detailed list of the issues requiring attention in the EES. A group of issues that emerged from the community in the course of the EES investigations and as a result of the ongoing community engagement and communications program are:

- Community concerns about the ability of SGM to restore Big Hill and the ability of the responsible authorities to provide assurances that rehabilitation conditions will be met
- There could be a lasting negative impact on the Stawell community if Big Hill is not satisfactorily rehabilitated
- A satisfactorily rehabilitated Project area would be a good outcome and an asset for the Stawell community.
10 Rehabilitation Plan

10.2 Rehabilitation Plan

The Rehabilitation Plan provides the framework under which the Project area will be reinstated following the completion of mining activities. This plan is not intended to include reconstruction of built features. Rehabilitation of the North and South Pits and the footprint of the TWRS will aim to leave a final landform that:

- is visually compatible with the adjacent Big Hill landscape
- is made safe and geotechnically stable by the removal of historic mine shafts and voids and the creation of softened slope angles
- is stable and not prone to erosion, slipping, slumping or excessive settlement
- is sustainable, providing adequate substrate for vegetation establishment and sustained growth
- has a low fire risk
- has reduced maintenance requirements for the future land manager
- ensures no constraints are placed on future land uses.

The rehabilitation plan will enable the specific end land use to be defined during the Project through further consultation with community, NGSC and DEPI.

10.2.1 Key Rehabilitation Risks

The key risks to the successful rehabilitation of the Project area are:

- inadequate compaction of backfill material, leading to potential for settlement in excess of that predicted
- appropriate surface hydrology and soil surface stability are not re-established, leading to potential loss of resources through erosion

- target vegetation community fails to establish adequately due to:
  - inadequate rainfall at the time of seeding
  - unfavourable soil conditions for emergence
  - poor quality or insufficient seed resources
  - presence and/or competition from weeds
  - grazing by fauna
  - inadequate maintenance or management

- properties of the reconstructed soil profile (physical and chemical) are not appropriate for the long-term growth and survival of vegetation cover.

The Rehabilitation Plan and the associated Work Plan Variation will focus on strategies to minimise the key risks to achieving these aims.

The following sections outline measures to be undertaken to mitigate these risks and optimise the rehabilitation outcome for the Project area.
10 Rehabilitation Plan

Rehabilitation bond
SGM and Crocodile Gold are committed to effective rehabilitation of the Project site in accordance with the rehabilitation plan required under the MRSD Act, outlined above. The MRSD Act also provides for the potential situation where a licensee does not complete its rehabilitation requirements by requiring that all licensees, including SGM, provide a rehabilitation bond prior to commencing work. The rehabilitation bond provides surety for compliance with the rehabilitation requirements for the Project under the MRSD Act. The bond will be returned to SGM when the Minister for Energy and Resources is satisfied that the land has been rehabilitated as required, and that the rehabilitation is likely to be successful. The Minister must consult with the land manager of Crown land or owner of private land and NGSC in making this decision. If the Minister is not satisfied with the rehabilitation or the owner of the land requests further rehabilitation and SGM does not undertake the rehabilitation work required by the Minister, then the Minister can use the rehabilitation bond to pay for doing that rehabilitation work.

The amount of the rehabilitation bond will be calculated assuming Government will need to cover the cost of rehabilitating the Project site at any point in the Project life. The bond amount will be periodically reviewed and, if necessary, amended to match the predicted cost of rehabilitation as the Project progresses. The rehabilitation bond will be paid in the form of an unconditional bank guarantee (sometimes referred to as a Letter of Credit), and this is therefore protected from any event that might occur to the company.

Following completion of the Project and rehabilitation, the Government will not release the bond until it is satisfied that the final landform is safe and stable, non-polluting and the vegetation cover is likely to be self-sustaining. If long-term monitoring will be required to ensure that rehabilitation has been successful a percentage of the bond may be retained for an extended period to address any long term viability risks.

10.2.2 Landform Design
Landform design is a critical element in minimising the incidence of erosion from surface water flow. The likelihood of erosion is strongly correlated with slope length and slope angles, and is affected by soil properties. Physical properties of soil that determine the likelihood of erosion include the capacity to accept infiltration and the structural strength of the soil. Therefore, the focus of the landform design in reconstructing the Big Hill topography will be to minimise slope length and angle, while returning the site to a similar height and shape as it currently stands (with the exception of the historic mining voids, which will not be reinstated for safety reasons). As part of this approach, soil and waste materials most likely to resist erosion, while providing acceptable growth medium for vegetation, will be selected for outer surfaces.

Slope parameters
The North Pit will be backfilled to a similar height and approximate topography as that which currently stands, while the South Pit will be backfilled to blend into the surrounding landscape and minimise surface erosion potential, by minimising slope length and steepness.

The area of the North and South Pits is approximately five hectares and 9.9 hectares respectively. Currently, the existing slopes in both pit areas range from approximately 2.5H:1V to 10H:1V with a maximum height of approximately 35 metres. The backfilled slopes will include level containment benches with a spacing of 40 to 50 metres, and inter-bench slopes no steeper than 3H:1V (Figure 10-1).
10 Rehabilitation Plan

Figure 10-1  Schematic representation of an initial landform design option for backfilling the North and South Pits within the Project area

The benches will serve two functions, firstly to reduce slope lengths to help minimise erosion, and secondly to retain runoff from the slopes to help promote water infiltration and revegetation. A risk associated with water collecting on benches is that tunnelling may occur with sodic materials.

Further assessment of material types and location will be undertaken during mining in order to optimise the slope design such that the risks of erosion and tunnelling associated with potentially sodic materials are minimised.

As the North Pit area will be the most visible part of the Project area, the rehabilitated landform will be designed such that it blends in with the remaining ridge line and peak of Big Hill (i.e. the current location of the communications tower and fire watch building) which will not be mined. Additionally, the eastern side of the ridgeline will not be mined, leaving views of this area largely unchanged.

All areas will be covered with up to 100 millimetres of topsoil, with waste rock material below the topsoil selected for its potential to resist erosion. Once vegetation is established, the ground surface will be broken up to help reduce erosion by promoting infiltration.
Consolidation of back filled material
Uneven settling of the backfilled material over time may compromise the surface water drainage design, potentially leading to localised accumulation and ponding of water. An additional impact of localised ponding would be to increase the likelihood of tunnelling and piping in sodic waste materials. Uneven settling will be minimised through selective placement of appropriate backfill material and a higher level of compaction where future infrastructure is to be constructed to ensure the stability of footings. Potential impacts of uneven settling will also be minimised through the landform design, to ensure that the performance of the landform, particularly in terms of surface water management, is not compromised.

The location of the North Pit on the northwest side of Big Hill means that overall consolidation of the backfilled material mass may lead to some cracking between the backfilled material and the pit walls. However, local cracking would be monitored and filled if necessary and is highly unlikely to have implications for the geotechnical stability of the reconstructed landform. Stability analysis on the steepest slopes of the final rehabilitated Big Hill suggests that the landscape will be very stable, with FOS values equal to or exceeding 2.0.

The stability of the rehabilitated landform is detailed further in Chapter 8, Section 8.9.3.

10.2.3 Waste Characterisation, Selection and Management

Physical and chemical properties of waste rock
During mining operations, waste rock will be regularly sampled and evaluated in terms of its physical and chemical characteristics. The waste rock considered most likely to offer erosion resistance, together with adequate retention of soil water and the capacity to support vegetation, will be stockpiled separately at the TWRS and selected for placement on the outer surface of the backfilled landforms prior to topsoil placement. Important parameters to be assessed will include the proportion of coarse rock material in the as-mined waste, the particle size distribution of the fine fraction, the sodicity and associated degree of clay dispersion, pH and electrical conductivity. Management of waste rock is described in more detail in Chapter 8, Section 8.13.

In addition, screening of total sulphur and total metal concentrations of waste materials during operations will be undertaken to identify and manage waste rock with acid-forming potential or elevated levels of metals.

Specific details of the assessment approach will be detailed in a Waste Rock Management Plan to be developed by SGM prior to the commencement of the Project.

Waste rock placement
The strategic placement of waste rock during the backfilling of the North and South Pits is important to ensure the geotechnical stability and erosion resistance of the rehabilitated landform. In order to achieve this, waste materials designated for specific backfill locations will be identified and segregated in the TWRS.

To minimise the potential impact to the surrounding environment, any potentially acid forming waste rock identified will be stored separately from other waste rock and placed directly back into the pits at a level well above the future regional water table (i.e. above 225 metre AHD, refer to Section 8.12 ).
In order to ensure the geotechnical stability of the rehabilitated landform, two types of fill materials will be used in four zones as described below.

The two types of fill material used to backfill the North and South Pits are:

- **Type 1**: oxidized pit material, comprising gravel, clay and silt, but mainly gravelly silt, to be derived from excavation in the South Pit
- **Type 2**: crushed rock taken from the underground mining operation, comprising crushed basalt rock with nominal size up to 100 millimetres.

The North Pit will be filled with a combination of zones of fill material (Figure 10-2), which consists of:

- **Zone A**: will be filled with a ratio of one part Type 1 soil and two parts Type 2 fill (crushed rock) up to AHD+265. The base of the fill formed at Zone A will provide drainage for the rehabilitated landform and will ensure no perching of infiltrated water.
- **Zone B**: will be filled with Type 1 soil to AHD+300, each layer will be compacted or rolled with trucks or if necessary an approved compactor.
- **Zone C**: will be filled with Type 1 soil to AHD+300, this zone will be monitored and if necessary additional rolling of the material will be carried out to achieve the necessary compaction densities.
- **Zone D**: represents the surface contouring and will consist of material with higher gravel content. This material will be sourced from the harder quartz capping layer removed from the surface of Big Hill at the commencement of operations.

![Figure 10-2 Fill placement for North Pit](image)

The back fill plan for the South Pit will follow the same basic methodology as per the North Pit, with the key exception being that all material used will be oxide waste extracted from the North and South Pits and additional material from Mt Micke, or a suitable alternative, as required.
10 Rehabilitation Plan

10.2.4 Topsoil Management

Returning topsoil salvaged from the Project area prior to the commencement of mining operations is a key part of the rehabilitation process and will be important for re-establishing vegetation. If properly salvaged, preserved and respread, topsoil can significantly enhance revegetation outcomes and reduce the time required to rehabilitate a site. It is often a more favourable medium for seed germination and emergence, and in addition organic material and microorganisms contained in topsoil contribute to the availability and uptake of nutrients by plants.

The waste rock that will be used to backfill the North and South Pits will not contain the biological attributes of topsoil. Therefore, appropriate reuse of topsoil will be part of the strategy to rehabilitate the Project area.

The proposed topsoil management approach is consistent with the Licence Conditions for the existing SGM operations which indicate that reasonable measures must be taken to minimise adverse impacts on physical and biological health of soil, and that where excavation occurs, topsoil should be salvaged and placed in stockpiles (less than two metres) that are protected from erosion and compaction (Licence Conditions MIN5260, 3 April, 2011).

Topsoil will be salvaged from areas to be disturbed throughout the Project area, recognising that in some areas shallow soils over rock, or poor machinery access may limit topsoil salvage. The approach for removing and managing topsoil within the Project area will be as follows:

- native vegetation cleared from the Project area will be mulched for use on stockpiles or rehabilitated areas as appropriate
- trees and logs will be collected and stored, where practicable, for later return as fauna habitat in rehabilitated areas
- topsoil and underlying sands or gravels if present, will be stripped from areas where there is at least 100 millimetres of friable material and where machinery access is feasible, during drier months of the year
- where water is required for dust suppression purposes during soil handling operations, only uncontaminated surface runoff water will be used
- topsoil will be stored separately within the TWRS area, and will remain undisturbed and protected from surface water flow or ponding until required for re-use
- topsoil will be stockpiled using a paddock-dumping approach, creating depressions between loads to collect water and promote germination and plant cover
- stockpiles will be a maximum height of 2 metres
- any subsoil salvaged will be stockpiled separately from topsoil;
- topsoil stockpiles will be seeded with native species to minimise erosion and promote biological activity in the soil
- stockpiles will be identified with appropriate signage, with locations recorded on site maps
- weeds on stockpiled soils will be monitored and controlled as required.

Topsoil will be returned to rehabilitated areas to a depth of approximately 100 millimetres. It will be selected based on soil properties such as nutrient content, beneficial soil microorganisms, stored native seeds, its suitability as a germination medium, and potential constraints including stored weed seeds and erodibility.
Salvaged topsoils are likely to contain a substantial store of weed seeds and will therefore be used in areas where access for weed control purposes is most feasible. Soil considered to be the most weed-free and least susceptible to erosion will be directed to steeper areas.

If required, additional topsoil can be sourced from within the existing SGM site for the rehabilitation of the North and South Pit areas. Oxidised materials can also be substituted for topsoil if necessary. The highest quality topsoil will be used preferentially in areas where the reestablishment of vegetation is most important to the stability of the rehabilitated landform.

Reinstated topsoil will be protected by the application of a sprayed hydromulch to ensure immediate surface stability during the period of initial vegetation establishment and growth. Typically, this process involves applying a slurry of shredded newspaper and other additives as required, including seeds, fertilisers and chemical binding agents. The slurry is sprayed on to the soil surface using water cannons or sprayers, mounted on specialised vehicles. This would be applied as the Project area is rehabilitated and is capable of being applied to a number of hectares per day. Once applied, the mulch should maintain its integrity for several months, during which time a cover of grasses or equivalent vegetation would become established.

10.2.5 Vegetation Establishment

Vegetation establishment is a critical step in rehabilitating the Project area. Key success factors include seed or tubestock quality; adequate soil moisture to promote germination of seeds; and the physical properties of surface soils that affect seed emergence. Survival of vegetation will be influenced by the capacity of the soils to support growth of the species selected, which in turn depends on the soil profile, the presence of adequate nutrients and soil moisture. The rehabilitation strategies proposed in the following section aim to address these factors and optimise rehabilitation outcomes.

Selected species will be established using broadcast seed and tubestock. This will be undertaken during the autumn-winter period to take advantage of seasonal rainfall patterns. To ensure successful establishment and survival of vegetation within the Big Hill area, SGM will consider the installation of a reticulated irrigation system.

Following backfilling in Year 2, the North Pit will undergo rehabilitation. The timing of rehabilitation will be determined by the mining schedule, with the earliest vegetation establishment expected to occur in the second or third winter following the commencement of mining (dependent on the timing of approval and the subsequent commencement date).

10.2.6 Mine Closure Plan

Existing Closure Plan

SGM maintains a site Closure Plan that is reviewed periodically by ERR and the closure provision (bond) is adjusted accordingly to the amount required to rehabilitate the land post closure. This approved closure plan is required under the conditions of SGM’s mining lease and details elements of existing infrastructure that will be utilised by the Project but are excluded from the scope of this EES (e.g. the processing plant and TSF). The Closure Plan also includes the rehabilitation of Mt Micke.
10 Rehabilitation Plan

Framework for Closure Criteria

Following the successful rehabilitation of the Project area, responsibility for management of the site will be transferred from SGM to an appropriate authority. As part of a transfer of responsibility for the area, an agreed framework of objectives and criteria for rehabilitation and mine closure will be required. The elements of the closure criteria framework are defined in Table 10-1 and the framework proposed for the rehabilitated backfill areas in Table 10-2. This framework takes into consideration the Guidelines for Environmental Management in Exploration and Mining: Rehabilitation Plans and other environmental aspects of Work Plans.

The framework will present broad rehabilitation objectives, supported by more-specific closure criteria. The framework will incorporate aspects ranging from physical elements (e.g. stability, drainage, erosion and suitability of materials to support plant growth) through to biological aspects (e.g. vegetation establishment and growth) and post-closure management.

Table 10-1  Definitions of the five closure criteria table elements

<table>
<thead>
<tr>
<th>Element of Criteria Framework</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspect</td>
<td>Broad topics for which multiple criteria can apply (nine aspects are considered applicable for rehabilitated areas in the Project)</td>
</tr>
<tr>
<td>Objective</td>
<td>A general purpose or goal for rehabilitation, relating to each aspect. Usually one objective applies for each aspect but more may be applicable.</td>
</tr>
<tr>
<td>Criteria</td>
<td>Specific attributes that are critical in achieving the objective, and are measurable</td>
</tr>
<tr>
<td>Measurement Approach</td>
<td>States how the criteria is measured</td>
</tr>
<tr>
<td>Standard</td>
<td>A defined outcome or numerical value at which point a criterion is considered to be achieved</td>
</tr>
</tbody>
</table>

Given that the physical elements of rehabilitated landforms are necessarily planned and constructed before biological components can be established, it is useful to consider the framework of closure criteria in separate sections relating to three sequential phases. Accordingly, the rehabilitation phases used in the following section are:

Phase 1: planning and landform construction

Phase 2: surface preparation and vegetation establishment

Phase 3: monitoring, remediation and relinquishment.

Each of the proposed nine aspects for rehabilitation and closure has at least one objective (Table 10-2). The criteria supporting each objective will provide a focus for rehabilitation monitoring. In developing the preliminary criteria the aim is for them to be specific, measurable, attainable, relevant, and time specific. The measures outlined in Table 10-2 will be implemented to the satisfaction of the relevant regulatory authority.
# 10 Rehabilitation Plan

## Table 10-2  Framework for rehabilitation and closure criteria with supporting objectives, criteria, measurement approaches and standards

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objective</th>
<th>Phase</th>
<th>Key Success Criteria</th>
<th>Measurement Approach</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Community and other stakeholders</strong></td>
<td>Stakeholders will be consulted in relation to post-closure outcomes.</td>
<td>Phase 1</td>
<td>Key stakeholders will be provided with the opportunity to provide input which will be incorporated in the Closure Plan where feasible.</td>
<td>Evidence of stakeholder consultation activities prior to closure.</td>
<td>Compliance with Stakeholder agreements.</td>
</tr>
<tr>
<td></td>
<td>Appropriate land tenure will be in place prior to relinquishment.</td>
<td>Phase 3</td>
<td>Appropriate tenure will be in place for the rehabilitated Project area, including roads and any infrastructure transferred to a third party prior to relinquishment or handover.</td>
<td>Review status of tenure for all components of the Project area, prior to infrastructure transfer and closure.</td>
<td>Tenure appropriate to post-closure land use. Signed agreement in place regarding post-closure responsibility prior to transfer of infrastructure to a third-party.</td>
</tr>
<tr>
<td>2. <strong>Geotechnical stability</strong></td>
<td>Landforms will be safe and structurally stable.</td>
<td>Phase 1</td>
<td>Final landforms and constructed drainage features conform to approved designs and specifications which incorporate appropriate factors of safety to ensure design intent is maintained for the long term.</td>
<td>Evidence that final landform construction meets approved designs and specifications. Review undertaken against company standards.</td>
<td>Compliance with approved designs and specifications.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 1</td>
<td>A geotechnical review of each waste rock landform by an appropriate specialist is accepted by appropriate regulating agency on completion of decommissioning works.</td>
<td>Evidence of acceptance from the appropriate regulating agency of waste rock landform as-built reports.</td>
<td>Acceptance of geotechnical review and final as-built documentation by appropriate regulating agency.</td>
</tr>
<tr>
<td>3. <strong>Infrastructure</strong></td>
<td>Infrastructure will be removed, except as agreed with key stakeholders.</td>
<td>Phase 2</td>
<td>Infrastructure not required is removed from site or buried, except where an asset transfer agreement is in place with appropriate stakeholders for retention.</td>
<td>Review infrastructure removal works, and status of asset transfer agreement for retained infrastructure.</td>
<td>Infrastructure removed unless otherwise agreed and asset transfer agreement in place for retained infrastructure.</td>
</tr>
</tbody>
</table>
## 10 Rehabilitation Plan

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objective</th>
<th>Phase</th>
<th>Key Success Criteria</th>
<th>Measurement Approach</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4. Managing mine wastes</strong></td>
<td>Mine waste materials with potential for environmental impact are appropriately contained.</td>
<td>Phase 1-2</td>
<td>Potentially hostile wastes are identified, managed and contained within landforms according to approved landform design and mine waste management plans.</td>
<td>Evidence of materials characterisation and audit of mine waste management and containment within landforms in accordance with approved designs.</td>
<td>Compliance with designs and management plans.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 1-2</td>
<td>Mine wastes with favourable properties in terms of erosion resistance and capacity to support vegetation will be placed as the final surface on landforms.</td>
<td>Evidence of materials characterisation and audit of mine waste management and placement on landforms in accordance with approved designs.</td>
<td>Compliance with designs and management plans.</td>
</tr>
<tr>
<td><strong>5. Access</strong></td>
<td>Reinstate access to Big Hill as agreed with stakeholders</td>
<td>Phase 1</td>
<td>Road for appropriate vehicle access to top of Big Hill is included in landform planning.</td>
<td>Review of landform plans.</td>
<td>Compliance with Rehabilitation Plan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 2</td>
<td>Access to rehabilitated areas maintained according to a Mine Closure Plan agreed with key stakeholders, including consideration of ongoing monitoring, and management of fire, forest diseases, and weeds.</td>
<td>Review against Rehabilitation Plan.</td>
<td>Compliance with Rehabilitation Plan.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 2</td>
<td>Roads not required for agreed post-closure access are rehabilitated.</td>
<td>Review against Rehabilitation Plan.</td>
<td>Compliance with Rehabilitation Plan.</td>
</tr>
</tbody>
</table>
## 10 Rehabilitation Plan

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objective</th>
<th>Phase 1</th>
<th>Key Success Criteria</th>
<th>Measurement Approach</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Topography</td>
<td>Landforms will be consistent with the pre-mining landscape, will facilitate a return to the regional drainage function and will not adversely affect the surrounding natural environment.</td>
<td></td>
<td>Landforms will fit within the pre-mining landscape in terms of height and where practicable in terms of overall topography, including no steep or abrupt landscape features.</td>
<td>Survey of height (metres AHD). Visual inspection of final landform.</td>
<td>Waste rock landforms will have the same maximum AHD as before mining. No steep or abrupt landscape features.</td>
</tr>
<tr>
<td>and drainage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 2</td>
<td>Runoff water quality will be suitable for the receiving environment.</td>
<td>Water analyses for a time period to be defined, prior to release of water to the receiving environment.</td>
<td>Runoff water exiting mining areas to comply with agreed water quality guidelines.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Phase 3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Surface</td>
<td>Final landform surfaces develop resistance to erosive forces.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>stability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Landform slope parameters and material characteristics are consistent with those set out in approved landform designs.</th>
<th>Review slopes and surface profile against approved landform designs.</th>
<th>Compliance with approved landform designs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phase 2</td>
<td>Final surface materials and treatments, and drainage control structures, are matched to the characteristics of the slope and are consistent with those set out in approved landform designs.</td>
<td>Review final surfaces and drainage controls against approved landform designs.</td>
<td>Compliance with approved landform designs.</td>
</tr>
<tr>
<td>Phase 3</td>
<td>Erosion features should not threaten the integrity of landform design, and not create hazards that may unreasonably impede land management.</td>
<td>Conduct erosion inspection following completion of rehabilitation earthworks, and continued observation until relinquishment.</td>
<td>Quantitative standard to be developed by rehabilitation technical specialists as part of the final rehabilitation plan.</td>
</tr>
</tbody>
</table>
10 Rehabilitation Plan

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Objective</th>
<th>Phase</th>
<th>Key Success Criteria</th>
<th>Measurement Approach</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>8. Soil fertility and surface profile</td>
<td>The soil profile will be suitable for the development of vegetation cover.</td>
<td>Phase 2</td>
<td>A suitable soil profile is in place to facilitate plant establishment and growth, of selected vegetation.</td>
<td>Review rehabilitation works against approved Rehabilitation Plan.</td>
<td>Soil profile to consist of topsoil to a maximum thickness of 10 centimetres over mine wastes matched to soil characteristics of reference ecosystems. Soils have been treated to remove constraints to root growth and create surface roughness. Fertiliser has been applied at an appropriate rate, to be defined based on assessment of reference ecosystem.</td>
</tr>
<tr>
<td>9. Management after closure</td>
<td>Rehabilitated areas will be able to be managed as required for the agreed post-mining land uses.</td>
<td>Phase 3</td>
<td>Weed populations do not require specific management above that of the surrounding land.</td>
<td>Visual inspection and quantitative monitoring where appropriate.</td>
<td>Density of weed species is no greater than adjacent vegetation; consistent with requirements under the Catchment and Land Protection Act 1994.</td>
</tr>
</tbody>
</table>
10 Rehabilitation Plan

10.3 Infrastructure Restoration

10.3.1 Public Access Road
Big Hill Road is proposed to be reinstated following the completion of mining activities. NGSC supports in principle this reinstatement, and will consider the need to reinstate Scenic and/or Reefs Road as part of the detailed public space use/access plan for the site.

10.3.2 Historic Monuments and Memorials
Historic monuments and memorials removed and temporarily stored offsite for the duration of the Project will be reinstated. Table 10-3 outlines the basic measures required to reinstate each of the historic memorials. These details will be finalised once the construction details and structural stability of each is determined during their relocation prior to the commencement of the Project.

Table 10-3 Proposed reinstatement of historic memorials

<table>
<thead>
<tr>
<th>Historic Memorial</th>
<th>Proposed reinstatement measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pioneer Memorial Rotunda</td>
<td>Construct new concrete base, walls, steps and bollards and reinstate copper dome roof, and directional plaque on new pedestal, inscribed memorial foundation stone</td>
</tr>
<tr>
<td>Dane Memorial Seat</td>
<td>Reinstall head stone memorial engraving, pending assessment of the structural stability of the arms, seat and back rest, which may require reconstruction should they not be preserved.</td>
</tr>
<tr>
<td>Water Supply Memorial</td>
<td>Reinstall the engraved plaque and stone on new concrete slab</td>
</tr>
<tr>
<td>Apex Arboretum Gates</td>
<td>Reinstall hardwood timer beam and slate-finished concrete pillars and ground beams on new concrete slab</td>
</tr>
<tr>
<td>Quartz Reef Discovery Monument</td>
<td>Reinstall monument on new concrete slab</td>
</tr>
</tbody>
</table>

10.3.3 GWMWater Potable Water Tanks and Water Storage Reservoirs
GWMWater potable water tanks 1 and 2 will be recommissioned following the completion of adjacent mining activities. The structural integrity of these assets will be assessed prior to recommissioning. Once this is established to GWMWater’s satisfaction, these tanks will be refilled from the AquaTower treatment plant and continue to supply potable water to the Stawell township.

GWMWater water storage reservoirs 4 and 6 will be recommissioned following completion of mining activities in the North and South Pits respectively. The geotechnical stability of these assets will be assessed and any excess dust deposited as a result of mining activities removed prior to recommissioning. Recommissioning will only commence once GWMWater is satisfied that they are fit for purpose.

Recommissioning of the potable water tanks and water storage reservoirs will be undertaken in to the satisfaction of GWMWater and agreements established between SGM and GWMWater prior to the commencement of the Project.
10 Rehabilitation Plan

10.3.4 GWMWater Grazing Pasture Land
Following the removal of all waste rock from the TWRS to backfill the North and South Pits, land currently owned by GWMWater and leased for grazing purposes will be reinstated such that it is suitable for this use. This will be undertaken in accordance with an agreement established between SGM and GWMWater prior to the commencement of the Project.

10.3.5 Sediment Basins and Drainage Channels
Sediment basins and drainage channels established during the Project to manage surface water within the Project area will be infilled once adequate erosion mitigation measures (i.e. vegetation) are established such that runoff fraction imperviousness is typical to that of any forested area and therefore water quality treatment is no longer required.

10.4 Master Plan and Future Land Use
It is proposed by SGM that a Master Plan will be developed for the rehabilitated Project area should the Project receive approval. This plan will detail the infrastructure and uses to be included on the site, which will be identified in consultation with NGSC, the land manager and the Stawell community.

The long term strategy for the Project area is for it to be returned as a community asset. The site will be rehabilitated to a safe, stable and sustainable landform by SGM as part of the mine closure process. This rehabilitation process will not preclude any future land uses which will be developed as part of a master plan for Big Hill and surrounding public open space.

The surrender of SGM’s rehabilitation bond will occur following the satisfactory rehabilitation of the Project area. Management of the land will revert to DEPI in the absence of alternative arrangements.

10.5 Stakeholder Engagement
SGM has undertaken extensive consultation to gain an understanding of how the Stawell community wants Big Hill to be rehabilitated should the Project receive approval. The following organisations having been consulted on the nature of their current use of the site, how they would use the site following the completion of the Project and their priorities for the rehabilitated site:

- Project Platypus Stawell Urban Landcare Group
- Eventide Homes
- St Patrick’s Primary School
- Stawell Athletics Club
- Interwne
- Stawell Secondary College
- Stawell Historical Society.
10 Rehabilitation Plan

Many ideas have been generated during this consultation process, ranging from walking tracks and a picnic area to a meeting place, coffee shop and running track with exercise stations. The wider community consultation and social impact assessment process for the EES has indicated clearly, that while Big Hill is viewed as an important part of the Stawell landscape, it is seen as degraded by past mining activities and subsequent uses. As such, there is community sentiment that the rehabilitation of Big Hill if the mining project proceeds provides an opportunity to create a safe, stable and sustainable community-shaped asset for Stawell.

NGSC has also been involved in ongoing briefings and discussions about their vision for the rehabilitated site. The master plan will be developed in consultation with Council to ensure it meets with Council’s public open space strategy.

10.6 Rehabilitation Case Studies / Examples

During the EES community consultation process, the ability to rehabilitate Big Hill was raised as a key concern, with over 50 per cent of the SIA survey participants expressing concern about the technical feasibility of the rehabilitation process.

Concerns that have emerged through community and stakeholder engagement include:

- the ability to undertake rehabilitation adjacent to a township
- the ability to rehabilitate a slope with respect to landform stability and surface water run-off
- the ability to store and rehabilitate using potential acid forming materials.

The examples below address these concerns by demonstrating the successful rehabilitation of similar mining projects within Australia.

10.6.1 Rehabilitation Adjacent to a Township

The Paddy’s Flat project involved the open cut mining of a number of pits located surrounding the township of Meekatharra, approximately 500 kilometres northeast of Geraldton. Lukes Pit was located adjacent to the town boundary and was rehabilitated using waste rock in 1995. The construction of the rehabilitated landform at Lukes Pit was carefully managed to create a contoured land form and facilitate its rehabilitation, with reduced batter angles to minimise erosion. The dump was completely seeded in the period up to July 1995.

The key to the success of the rehabilitation of Luke’s Pit was the characterisation of the waste rock used to create the rehabilitated landform, and the selection of appropriate plant species which would ensure the stability of the recreated surface. Geochemical analysis of mine waste found that the waste rock was typically alkaline, while surrounding topsoil was extremely acidic. Plant species that were able to tolerate the range of soil conditions present were therefore selected to revegetate the rehabilitated landform (Figure 10-3).
The rehabilitation process was conducted in close consultation with the community, and subsequently, few complaints were received. The community began to actively use the site within a few years of its rehabilitation, with a lookout constructed by the Lions Club in conjunction with the local indigenous community (including interpretive signage) in 2004 and a bitumen road constructed by the local council in 2010 (Figure 10-4). The lookout is now a popular place for local residents and tourists to enjoy the view of the surrounding landscape (Figure 10-5).
10 Rehabilitation Plan

This example shows that with the appropriate care taken in the selection of soil and plant types, an open cut mine adjacent to a rural township can not only be successfully rehabilitated, but become a valued community asset.

10.6.2 Rehabilitation within Undulating Topography

Wendy Gully mine was an open cut gold mine located approximately 40 kilometres north of Kalgoorlie. The local, undulating topography was characterised prior to rehabilitation to enable the landform design to be blended into the surrounding environment. Reestablishment of the local plant community and appropriate drainage to minimise runoff has resulted in a landform with good long-term stability and erosion resistance, as shown by a rigorous ongoing monitoring program.
10 Rehabilitation Plan

10.6.3 Rehabilitation using Potentially Acid Forming Material

11 Mile Well was an open cut nickel sulphide mine located approximately 350 kilometres north of Kalgoorlie. Mining was completed and the site rehabilitated in 1998. Testing of the waste rock extracted during mining showed two types of potentially acid forming (PAF) material. This material was managed by storing it separately and securely for the duration of the project and placing it back into an encapsulated wedge to prevent its exposure to the surrounding environment (Figure 10-7).

![11 Mile Well pit rehabilitation in progress showing segregated use of different material types](image)

To enable successful revegetation of the rehabilitated landform, an adequate surface zone was created to enable plant growth without penetrating the PAF zone (Figure 10-8).
10 Rehabilitation Plan

Figure 10-8  Former 11 Mile Well pit following rehabilitation

This project shows that with the appropriate management of potential problematic waste materials, long-term rehabilitation success is achievable.