

Appendix H2

Rehabilitation, Closure and Environmental Objectives

1 Aim of the Rehabilitation Plan

The aim of the rehabilitation plan is to:

- Return the disturbed area to an acceptable post mining state;
- Ensure that all areas are stable, and there is not risk of erosion;
- Prevent alien plant invasion on the site until the site is in a stable state; and
- Ensure that all areas are free draining and non-polluting.

The mining operations areas include agricultural grazing land. The continuous rehabilitation program will attempt to restore the area to an acceptable standard as close to its baseline environmental state as possible.

2 Management Criteria for the Rehabilitation of the Land

The following management measures are required:

- The areas will remain fenced, and all animals (i.e. livestock) kept off until the vegetation is self-sustaining;
- Newly planted / seeded areas will be protected against compaction and erosion;
- Traffic will be limited until the vegetation is self-sustaining;
- Vegetation will be watered, if required, and weeded at least once in six months;
- On-going monitoring for pests and diseases will be undertaken at least once in six months and vegetation will be treated in accordance with identified accepted procedures if necessary; and
- Any damage caused by erosion will be rehabilitated and the necessary erosion control measures will be maintained.

3 Rehabilitation Plan

3.1 General requirements

- a) Rehabilitation will be restricted to areas excavated and used for the purposes of this project (see mining plan layout included in Appendix B).
- b) The objective of rehabilitation will be to restore the borrow pit to a condition which is as similar as possible to the natural environment or to the pre-determined end use.
- c) Rehabilitation shall commence as soon as the advancing face and sufficient working / loading area moves away from an area that has been mined out to the proposed limit of mining.
- d) Final rehabilitation will take place on completion of the borrow process and shall continue for six months after completion of the project or until a certificate of closure is issued by the Department of Mineral Resources, whichever is the longer.

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3.2 Surplus material and topsoil

- a) On completion of mining, all surplus material in and around the excavations, including any stockpiled gravel or oversized rocks, but excluding topsoil, shall be returned and the sides of the pit shall be graded at 1v:3h slopes.
- b) Stockpiled gravel will be left inside the pit for use on future projects.
- c) The topsoil stockpiled prior to mining shall be spread evenly over designated areas of the borrow pit, to a thickness of not less than 75 mm.
- d) Topsoil from adjacent road clearing activities can also be used to supplement topsoil for mining areas where topsoil is deemed to be inadequate by the engineer.
- e) The topsoil must be keyed into the re-profiled surfaces to ensure that they are not eroded or washed away.
- f) The top-soiled surface shall also be left fairly rough (ie not smoothed down) to enhance seedling establishment, reduce water run-off and increase infiltration.

3.3 Landscaping

- a) All borrow pit slopes shall be finished to produce a smooth rounded concave / convex surface.
- b) Ensure that hard rock slopes are safe. Benching of these slopes is preferred.
- c) The floor of the borrow pit shall be made gently undulating in keeping with the landscape surrounding the excavation.
- d) The rehabilitated land will be visually in keeping with the immediate environment, and any negative visual impact will be rectified to the satisfaction of the Regional Manager.

3.4 Re-vegetation

- a) No seeding of replaced topsoil should be required, unless topsoil has been stored for a period longer than 12 months. Once replaced, the topsoil will be left to revegetate naturally unless the process does not occur unaided or if significant topsoil erosion occurs.
- b) The prepared surfaces shall be irrigated regularly for the initial 30 day period and monitored for natural re-growth. If necessary, planting or seeding shall be undertaken if natural vegetation did not begin to establish after 30 - 60 days (specialist guidance shall be sought to determine the exact requirements).
- c) Should the initial approach be deemed insufficient, the problem areas shall be seeded with suitable grass species to provide an initial ground cover and stabilize the soil surface. *Melinis repens*, *Eragrostis curvula*, *E. plana* and *Cynodon dactylon* are species that can work in this regard and seeds can either be collected on site (using a mower or by hand) or purchased from a relevant local seed supplier.
- d) During rehabilitation, specific consideration must be given to the slopes as these areas are more prone to erosion before the new vegetation can establish.
- e) No alien species shall be planted at any time in this area, and any invasive alien plants that establish during rehabilitation should be manually removed.

3.5 Drainage works / erosion protection

- a) Areas where mining is completed shall be rehabilitated immediately to reduce the opportunity for erosion.

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- b) Mining operations should be conducted in phases, thereby limiting the scale of erosion.
- c) The final surface level shall be free draining (unless otherwise indicated) and the necessary measures will be taken to prevent erosion until such time that the vegetation is sufficiently established.
- d) Runnels, erosion channels or wash-aways developing after rehabilitation shall be backfilled and consolidated and the areas restored to a proper stable condition.
- e) Brush packing can be used in erosion runnels or at drainage outlets.
- f) Central borrow pit areas are likely to become water traps in the long-term and the rehabilitation procedure should aim to complement this - i.e. the use of locally occurring water tolerant grasses, sedges and reeds would be recommended.

3.6 General site clean-up

- a) All infrastructure, equipment, plant, fencing, temporary services and foreign materials shall be removed from the site (according to section 44 of the MPRDA).
- b) Waste material of any description, including receptacles, scrap, rubble and tyres will be removed entirely from the mining area and disposed of at a recognised landfill facility. It will not be permitted to be buried or burned on the site.
- c) Internal access tracks, not required by the landowner, shall be obliterated by breaking the surface crust and scarifying the area to a depth of 250 mm, whichever is the shallower, and then be covered with stockpiled topsoil.
- d) The borrow pit will be kept in a neat and tidy condition at all times.

3.7 Additional measures

- a) No construction equipment, vehicles or unauthorised personnel shall be allowed onto areas that have been rehabilitated.
- b) Only persons or equipment required for the preparation of areas, application of fertiliser and spreading of top material shall be allowed to operate on these areas.
- c) Permanent, stock-proof fencing shall be erected / reinstated alongside the road.

4 End Use

On completion of the project the owner is to be consulted as to whether the borrow pit will be continued to be utilised for material or is to be rehabilitated and vegetated for grazing purposes.

5 Closure

When the holder of the mining permit intends closing down the mining operations, an environmental risk report shall accompany the application for closure.