

Appendix G

Environmental Management Programme (EMPr)

for Final Basic Assessment
Kokerboom Upgrade



Black Mountain Mining



1 Definitions

Specification: A technical description of the standards of materials and workmanship that the Contractor is to use in the Works to be executed, the performance of the Works when completed and the manner in which payment is to be made.

Works: The construction operations and all related and incidental works, such as site works, earthworks, installation of services, rehabilitation etc., in connection with the execution and carrying to completion of the facility.

Topsoil: Means the top 300 mm of soil and may include vegetation and rocks.

Reasonable: Means, unless the context indicates otherwise, reasonable in the opinion of the Engineer after he has consulted with a person, not an employee of the Employer, suitably experienced in "environmental implementation plans" and "environmental management programmes" (both as defined in the National Environmental Management Act (No 107, 1998).

Site: The boundary and extent of facility works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the facility to proceed successfully.

Environment: The surroundings within which humans exist and that are made up of the land, water and atmosphere of the earth, viz micro-organisms, plant and animal life; any part or combination of the above and the inter-relationships among and between them; and the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Engineer: A person representing the Facility Owner on site and who is responsible for the technical and contractual implementation of the works to be undertaken. This is usually the engineer, but may be any other person, such as an architect or project manager, authorized by the Facility Owner to fulfil this role.

2 Introduction

This chapter identifies and presents the extent of issues created and mitigation measures required during the construction, operational phases of the proposed project: 'to upgrade Kokerboom reservoir and pipeline' (hereafter referred to as 'the Kokerboom Upgrade') and associated infrastructure. This Environmental Management Plan (EMP) is required in accordance with the EIA Regulations (2010) in terms of Chapter 5 of the National Environmental Management Act (No 107, 1998), as amended.

The aim of an EMP is to facilitate appropriate environmental controls during all phases of the project and to fulfil the objectives of the EMP that confirms the reason for the EMP. The EMP is required in order to:

- Assist in ensuring continuing compliance with South African legislation and applicable policies/ guidelines;
- Provide a mechanism for ensuring that measures identified in the Basic Assessment Report designed to mitigate potentially adverse impacts, are implemented;
- Provide a framework for mitigating impacts that may be unforeseen or unidentified until construction is underway;
- Provide assurance to regulators and stakeholders that their requirements with respect to environmental and socio-economic performance will be met; and
- Provide a framework for compliance auditing and inspection programs.

3 Legal Requirements to be met

Obligations imposed by the EMP are legally binding in terms of environmental statutory legislation (i.e., the Environmental Authorization in terms of the National Environmental Management Act No.107 of 1998, as amended) and in terms of amendments to the Particular Conditions of Contract that pertain to this project.

The requirements of this EMP are the responsibility of the facility owner, specifically during the operational phase and possible decommissioning / closure phase should this become applicable.

The requirements of this EMP do not release the Facility Owner from the requirements of any other legislation that may be applicable to the project.

A list of Legislation applicable to the project (although not limited to those listed) has been provided below for guidance:

- National Environmental Management Act No.107 of 1998;
- National Environmental Management: Biodiversity Act (Act 10 of 2004);
- National Heritage Resources Act (No 25 of 1999);
- National Water Act (No 36 of 1998);
- Conservation of Agricultural Resources Act (No 43 of 1983);
- Occupational Health and Safety Act (No 385 of 1993); and
- Hazardous Substances Act (No 63 of 1977).

4 Roles and Responsibilities

Roles and Responsibilities are assigned to ensure this EMP is implemented adequately. The following roles are identified as important to ensure appropriate responsibilities of this EMP are performed.

The key role-players during the construction phase of the infrastructure, for the purposes of environmental management on site, include but are not limited to:

- Project Design Engineer: BVI Consulting Engineers;
- Project Construction Engineer: Vedanta Zinc International (VZI), Black Mountain Mining Pty (Ltd) (BMM);
- Operational Manager: VZI, BMM;
- Facility Owner: Pella Water Board; and
- Permit holder: BMM and Pella Water Board.

5 Standards and Procedures

Procedures and standards to be followed during the construction and operational phases (Please refer to Appendix J):

- Vedanta waste management plan;
- Engineering desings;
- Method statement; and
- Vedanta rehabilitation standard.

Communication and liaison with the community can take place through Vedanta's environmental office to lodge any complaints. These will be responded to by Vedanta within 48 hours.

6 Environmental Management Programme

Impact management objectives will be developed to ensure that adverse socio-economic impacts are minimized, and socio-economic benefits are maximized. Measures will further be defined to avoid, prevent, limit or manage any impacts.

The objectives of the EMPr will be to:

- Provide sufficient information and guidance to plan upgrading activities in a manner that would reduce both social and environmental impacts as far as possible;
- Provide a management plan that is effective and practical for implementation; and
- Ensure an approach that will provide the necessary confidence in terms of environmental compliance.

Through the implementation of the mitigation and management measures it is expected that:

- Limited biodiversity and flora species loss will take place;
- Ecological impact can be managed through the implementation of pollution prevention measures, land clearance minimization, and rehabilitation;
- Limited loss of topsoil will take place; and
- Surface hydrology impacts can be managed by proper maintenance.

Table 1: Environmental management program

Element	OUTCOMES	ACTIONS			
	Environmental Management Objective	Avoidance Measures	Reduction Measures	Remedial Measures	Monitoring Measures
Flora	To minimise destruction or degradation of flora and ensure legal compliance in this regard	Demarcate all areas that require vegetation clearance to reduce footprint and peripheral damage. Demarcate all nationally protected trees as no-go areas.	Vegetation clearing to commence only after walk through has been conducted and necessary permits obtained (TOPs, Red Data listed or provincially protected species). A protected tree may not be removed, damaged, disturbed or destroyed without a valid Forest Act License, irrespective of whether it occurs naturally or was planted artificially.	Rehabilitation should be done according to the Mining Right Closure Plan. It is recommended that adequate and appropriate surface preparation which will encourage natural regeneration of the vegetation and ensure long-term vegetation recovery is performed.	
Flora	Ensure vegetation protection through the project life cycle	No unauthorised site clearing or disturbance at the site without an ECO present.	Limit vegetation clearing to areas that will be impacted immediately. Inspect vegetation for protected species and ensure search and rescue before vegetation clearance.	Ensure all vegetation is stockpiled for re-use in rehabilitation and/or relocated to other areas ready to be rehabilitated. Collect seeds from all specimens earmarked for removal to aid in rehabilitation.	Monitor survival of relocated species post-relocation to aid future relocation strategies. All other DFFE and DAEALRD monitoring requirements must be complied to.
Fauna	Manage interaction with fauna during construction		The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden. Personnel should not be allowed to wander off the demarcated construction footprint. Fauna permits must be obtained if any faunal species are to be disturbed and/or their habitats destroyed (including Cape Ground Squirrel Nests).	Any fauna directly threatened by the construction activities should be removed to a safe location by the ECO or other suitably qualified person. Faunal sweeps within habitats such as bush clumps should take place before clearing and any fauna located should form part of a search and rescue and relocated to safety. Phased dozing is to be applied to ensure animals move out of the area prior to earth works (gradual/slow clearing of areas where nests are present).	

Element	Environmental Management Objective	Avoidance Measures	Reduction Measures	Remedial Measures	Monitoring Measures
Fauna	Limit faunal habitat destruction and fragmentation during site clearance and construction	Take breeding seasons into account when scheduling construction activities.	Reduce the footprint size by proper planning and restricting activities to previously disturbed areas as far as practicable.	Encourage natural recovery by means of storm water diversions and landscaping, replacement of topsoil.	
Biodiversity	To minimize destruction or degradation of biodiversity	<p>All indigenous species is retained as far as possible and where alien species are encountered; they are removed.</p> <p>The selection of laydown areas will consider already disturbed areas first.</p> <p>All construction staff should undergo an environmental induction from a suitably qualified person regarding the importance of footprint management.</p> <p>All construction vehicles should adhere to a low-speed limit to avoid collisions with susceptible species such as snakes and tortoises, as well as to minimize dust generation.</p> <p>All vehicles and machines to remain on demarcated roads and access routes.</p>	Any fauna directly threatened by the project activities should be removed to a safe location by the responsible person from the Environmental team.	Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.	
Soil	Manage topsoil, seedbank and organic matter resource	<p>Demarcate all areas that require soil clearance to reduce footprint and peripheral damage.</p> <p>The project site and loose material will not be exposed to rain resulting in excessive erosion, siltation and general disturbance.</p> <p>Apply topsoil concurrently and keep stockpiling to a minimum.</p>	<p>Limit soil clearing to areas where construction will take place immediately.</p> <p>Reduce compaction, subsoil, soil quality and contamination impact on soils by restoring areas as soon as practically possible.</p>	<p>Stockpile all topsoil cleared and protect (demarcate, vegetate or netting) topsoil stockpiles for future use.</p> <p>Where areas are significantly impacted (because of impact or delay in restoring areas) and unlikely to reach soil quality / characteristics originally proactive remediation must be implemented.</p>	Monitor equipment for pollution potential: All vehicles must be regularly inspected for leaks.

Element	Environmental Management Objective	Avoidance Measures	Reduction Measures	Remedial Measures	Monitoring Measures
Heritage	Minimise the impact on archaeological and palaeontological resources		If any concentration of heritage material (including graves, burials or human remains) are uncovered during the project, it should be reported to the South African Heritage Resources Agency immediately so that systematic and professional investigation/excavations can be undertaken. Sufficient time should be allowed to remove/collect such material.		
Waste	Ensure removal of construction related and general waste	The hierarchy of reduce, reuse, recycle and remediate will be followed.		All salvageable waste must be taken to BMM's registered Salvage Yard.	
Water - Surface	Reduce impact on surface hydrology and consequential secondary impacts	Storm water isolation berms must be constructed to isolate clean and dirty surface water areas.	Storm water berms must be vegetated immediately to protect against wind and water erosion and possible failure.	In terms of rehabilitating impacts (water use) (a) a systematic rehabilitation program must be undertaken to restore the watercourse to its condition prior to the commencement of the water use. Restoration of the hydrological regime as well as storm water control during operations will be required to ensure minimal silt and loose soils wash downwards towards the veld which is most susceptible to such disturbance.	Maintenance on all existing storm water isolation berms must be done as required

Element	Environmental Management Objective	Avoidance Measures	Reduction Measures	Remedial Measures	Monitoring Measures
Legislative	Manage Section 21 c and i water use risks	In terms of management, the water user must ensure that there is a budget sufficient to complete, rehabilitate and maintain the water use as set out in the GN notice 1180, 2015.	The pipeline cross various washes and requires application for general authorization in terms of section 21 c and i		
Rehabilitation	Manage rehabilitation sustainability through proper planning	Ensure a rehabilitation plan is in place that incorporate physical and biophysical (biotic and abiotic remediation) designs specific to the site conditions.			Monitor the rehabilitation plan and rehabilitation success annually.
Landscape	Restore landscape structure and function when areas are excavated	Avoid excavations in un-demarcated areas. Only pre-planned areas demarcated may be excavated.		Restore excavations by infilling and levelling as soon as practically possible.	
Economic	Maintenance and monitoring management	Sufficient resources and funds must be available to maintain the required monitoring and maintenance, data analysis and management of elements monitored throughout the project.		Maintenance plans should be in place for the site.	