

**Vergenoeg Mining  
Company (Pty) Ltd.**

**Proposed Pipeline & Waste Rock  
Dump: Draft EMP**

**Locality: Rust de Winter**

**Departmental Ref No. Gaut: 002/12-13/E0080**

**SHANGONI**  
*Management Services (Pty) Ltd*



# **DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME**

**Vergenoeg Mining  
Company (Pty) Ltd**

**Proposed Pipeline & WRD Draft EMP**

**Locality: Rust de Winter**

**Departmental Ref No.Gaut: 002/12-13/E0080**

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## PROJECT DETAILS

**Gauteng Department of Agriculture and Rural Development**

**Reference No.: Gaut: 002/12-13/E0080**

**Project Title: Pipeline and Waste Rock Dump Draft EMP**

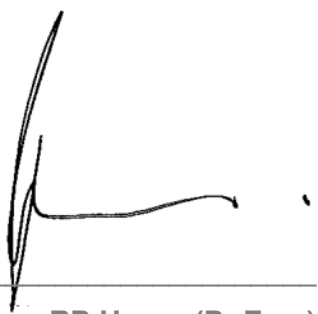
**Project Number: VER-EIA-11-06-01**

**Compiled by: Wilda Meyer**

**Date: December 2013**

**Location: Vergenoeg Mining Company**

**Technical Reviewer: B. Hayes**



RB Hayes (Pr.Eng.)



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## LIST OF ABBREVIATIONS

ECO – Environmental Control Officer
EIA – Environmental Impact Assessment
EMP – Environmental Management Programme
GN – Government Notice
HCS – Hazardous Chemical Substances
NEMA – National Environmental Management Act, 1998
NEMWA – National Environmental Management: Waste Act, 2008
NWA – National Water Act, 1998
SHE – Safety, Health and Environment
SWMP – Storm Water Management Plan
WRD – Waste Rock Dump

## REFERENCES

Environmental Impact Assessment (EIA) report titled: “*Vergenoeg Mining Company (Pty) Ltd., Pipeline and WRD EIA Report, dated September 2013 (Ref nr: Gaut: 002/12-12/E0080)*”.

Refer also to Section 4 regarding relevant environmental legislation.



# 1. Introduction

Vergenoeg Mining Company (Pty) Ltd is currently mining fluorspar on the farm Kromdraai 209 JR, which is situated approximately 75km north-west of Bela-Bela and 85km north of Pretoria on the border of the Limpopo Province.

Vergenoeg Mine is currently depositing their tailings within the existing Tailings Storage Facilities Number 3 and 4, located next to the pit and Plant on the western side. The lowest wall of the tailings facilities is the designated area where waste rock is currently being deposited, which acts as a buttress increasing the stability of the tailings facilities. These facilities have a limited remaining lifespan and needs to be replaced. Preferably, a good management strategy will be to change over to the new tailings facility (Tailings Storage Facility Number 5) before the current tailings dam storage facilities reach their maximum capacity. In this way, the current facilities can be used for standby in an event where pumping to the new facility has to be paused or ceased.

The mine proposes to undertake the following activities in support of the above-mentioned changes that are occurring on-site:

- The construction and use of tailings- and return water pipelines and associated infrastructure, and
- Waste deposition at a new Waste Rock Dump.

## 1.1 Tailings- and return water pipelines and associated infrastructure

The mine proposes to construct a pipeline to link the Plant with the newly constructed Tailings Storage Facility Number 5. The system will comprise of a collection of three pipes (two for tailings and one for return water) between 2.5 and 3 km in length.

An estimated 226m<sup>3</sup>/hr of tailings (92 tons/hr of solids and 202 t/hr water) will be pumped to the Tailings Storage Facility Number 5. As inspection and maintenance on the line must be done, vegetation clearance will be required.

Associated infrastructure includes a service road, power lines, pump houses on both sides of the pipeline and a seepage collection pond at Tailings Storage Facility Number 5.

A new 6.2 kV transmission line of approximately 3 km will supply pumps and lights at the new tailings storage facility with electricity. The 3 phase transmission line will be connected to the mine's existing substation and follow the same route as the pipelines. Overhead lines will be



suspended with wooden poles. Base pins will be used in the case of the preferred alternative to suspend the power lines when crossing over the wetland area. Bulk electricity is supplied to the mine from Eskom's Rust de Winter substation. Electricity supply to Tailings Storage Facility Number 5 will serve pumps and lighting.

A sump pump within the seepage collection pond will pump seepage back to the tailings storage facility from where a floatable barge pump will pump water into a balancing tank before pumping back to the return water dam (Red Dam). There will also be an option to pump directly from the seepage collection pond to the balancing tank. Recovered water will be pumped along the proposed pipeline for re-use in the Plant. Pumps will be secured within an enclosed building to reduce mechanical noise and vibrations to the surrounding environment.

## 1.2 Waste Rock Dump

An area of approximately 75 ha was identified next to the current operational tailings facilities to be used for the disposal of waste rock as well as stockpiling of marginal non-ores with a maximum capacity of 28 million tons / 11 million m<sup>3</sup>. The main strategy will be to start depositing adjacent to the tailings facilities and from there move outward as the Waste Rock Dump (WRD) size increases. The capacity of the proposed WRD should serve the mine for the next 25 years.

The main power supply line for the mine runs through the proposed Waste Rock Dump area along the road. A servitude is present for the particular line and is regularly serviced to prevent tree and scrub encroachment. Proper management is essential to ensure safe and effective operations. The last phase of the Waste Rock Dump will continue on the opposite side of the road and power line.

This Environmental Management Programme (EMP) document describes mitigation measures that need to be implemented during the Construction-, Operational-, and Decommissioning-Phases of the proposed project.

This EMP is applicable to the entire project area to ensure environmental control for all aspects of the project is implemented. The responsibility for the implementation of this EMP on site is the responsibility of the Environmental Manager.

This EMP should also be viewed as a dynamic document and should be kept at the mine offices. The mitigation measures indicated in this document must be implemented by all the site employees and contractors. Methods should be updated and improved during implementation, as site conditions become clearer and material or methods improve. This EMP attempts to



provide the most practicable methods to promote sound environmental management during the lifespan of the project.

## 2. Environmental Assessment Practitioner

<b>Name of firm</b>	Shangoni Management Services (Pty) Ltd.	
<b>Postal address</b>	PO Box 74726 Lynwood Ridge Pretoria 0040	
<b>Telephone No.</b>	(012) 807 7036	
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<b>E-mail</b>	leeanne@shangoni.co.za wilda@shangoni.co.za	
<b>Team of Environmental Assessment Practitioners on project</b>		
<b>Name</b>	<b>Qualifications</b>	<b>Responsibility</b>
Ms. Wilda Meyer	BSc. (Hons) (UJ)	EIA Project Leader
Ms. Lee-Anne Fellowes	B-technology Nature Conservation (TUT)	EAP

## 3. Site Documentation

The following documentation must be available at the site office at all times:

- A copy of the Environmental Impact Assessment (EIA) Report.
- A copy of this Environmental Management Programme (EMP).
- A copy of the Environmental Authorisation.

## 4. Legislation

### 4.1 Laws of General Application

- Constitution of the RSA, 1996 (Act No 108 of 1996);
- National Environmental Management Act, 1998 (Act No 107 of 1998);
- Environment Conservation Act, 1989 (Act No 73 of 1989);
- Promotion of Access to Information Act, 2000 (Act No 2 of 2000);
- Protected Disclosures Act, 2000 (Act No 26 of 2000).





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## 4.2 Air Quality and Noise

- Atmospheric Pollution Prevention Act, 1965 (Act No 45 of 1965);
- National Building Regulations and Building Standards Act, 1977 (Act No 103 of 1977);
- Environment Conservation Act, 1989 (Act No 73 of 1989) – Noise Control Regulations in terms of Section 25 of the Environment Conservation Act, 1989;
- National Environmental Management Act, 1998 (Act No 107 of 1998).

## 4.3 Water Management

- National Water Act, 1998 (Act No 36 of 1998).
- Government Notice (GN) 704, dated June 1999 under the National Water Act, 1998

## 4.4 Hazardous Chemicals and Substances

- Hazardous Substances Act, 1973 (Act no. 15 of 1973);
- Occupational Health and Safety Act, 1993 (Act No 85 of 1983) – GN 1179 of 25 August 1995 – Regulations for Hazardous Chemical Substances (HCS).

## 4.5 Waste Management

- National Environmental Management: Waste Act (NEMWA) No 59, of 2008;
- Environment Conservation Act, 1989 (Act No 73 of 1989);
- National Road Traffic Act, 1996 (Act No 93 of 1996) – GN R225 of 17 March 2000 – National Road Traffic Regulations;
- Hazardous Substances Act, 1973 (Act No 15 of 1973);
- Occupational Health and Safety Act, 1993 (Act No 85 of 1993) – GN 1179 of 25 August 1995 – Hazardous Chemical Substance Regulations.

## 4.6 Planning of New Activities

- National Environmental Management Act, 1998 (Act No 107 of 1998).
- GN R.543, GN R.544, GN R.545 and GN R.546, dated June 2010.

## 4.7 Biodiversity

- National Environmental Management Biodiversity Act, 2004 (Act No 10 of 2004);
- Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983);
- National Veld and Forest Fire Act, 1998 (Act No 101 of 1998)



## **4.8 Land and Soil Management**

- National Environmental Management Act, 1998 (Act No 107 of 1998);
- Environment Conservation Act, 1989 (Act No 73 of 1989).

## **4.9 Heritage Resources**

- National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999).

## **4.10 Protected Areas**

- National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003).

## **4.11 Mining**

- Mineral and Petroleum Resources Development Amendment Act, 2008 (Act No 49 of 2008).

During the course of the project phases, the mine and its contractors must comply with all other relevant legislation (including the bylaws of the local municipality).



## 5. Environmental Management Programme

Refer to the tables below for the EMP. In the tables below, responsibility is assigned to the relevant parties, keeping in mind that Vergenoeg Mining Company are ultimately still responsible for ensuring implementation of the EMP. The EMP must be updated should any significant changes occur to the operations with regards to the pipelines and associated infrastructure, as well as the Waste Rock Dump.

The mitigation measures are set out in the tables below (per project phase), for the pipelines and associated infrastructure and Waste Rock Dump respectively.

*Note:* Mitigation measures, as contained in the tables below, have taken the various alternatives into consideration.

### 5.1 Pipelines and associated infrastructure

#### 5.1.1 Planning and Design Phase

Table 1: EMP - Pipeline and associated infrastructure (Planning and Design Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Design and planning of the proposed pipelines and associated infrastructure	Inadequate planning and design.	Impacts on the environment that could potentially have been avoided.	To effectively plan and design the pipelines and associated infrastructure taking the on-site environment into consideration.	<ul style="list-style-type: none"> <li>• Site selection for the proposed activities must include consideration of the following:                             <ul style="list-style-type: none"> <li>➢ Sloping / gradient factors.</li> <li>➢ Contractor requirements and communication.</li> <li>➢ Design and construction requirements for spillage control, storm water management and erosion control measures.</li> <li>➢ Environmental legal requirements.</li> <li>➢ Water reticulation system (water balance).</li> <li>➢ Access to and from the proposed site.</li> <li>➢ The location of nearby drainage systems, watercourses and sensitive landscapes.</li> <li>➢ The habitats of fauna and flora species.</li> <li>➢ Protected plant and tree species.</li> <li>➢ Available water supplies.</li> <li>➢ Fire protection services and their reaction times.</li> <li>➢ Security and general service facilities in the area.</li> <li>➢ Future expansions (if applicable).</li> <li>➢ General housekeeping practices.</li> <li>➢ Existing mine procedures, Government Authority requirements and permit conditions.</li> <li>➢ Possible heritage or archaeological resources on-site.</li> <li>➢ Soil types and land capability.</li> <li>➢ Surface water quality (pre-project status) and possible impacts that would result from proposed activities.</li> </ul> </li> </ul> <p>The above listed information must be recorded before the construction at the site commences and should be used for future monitoring purposes.</p>	Vergenoeg Mine must verify that the indicated factors have been considered during site selection for the proposed activities	Complete prior to Construction Phase.	<ul style="list-style-type: none"> <li>• Mine Engineer</li> <li>• Environmental Manager</li> <li>• Specialists (where required)</li> </ul>



5.1.2 Pre-construction and Construction Phase

Table 2: EMP- Pipeline and associated infrastructure (Pre-construction and Construction Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
<p>Site preparation and construction of pipelines and associated infrastructure (including excavation, dozing, grading and installation activities).Associated infrastructure relates to pump houses, sumps, power lines, and service roads.</p>	<p>Clearance of vegetation</p>	<p>Habitat loss resulting in disturbance on the flora and fauna environment which has the potential to impact on biodiversity and habitat characteristics. This Includes:</p> <ul style="list-style-type: none"> <li>• Change in plant pollinator composition,</li> <li>• Loss of habitat,</li> <li>• Disturbance to animal life.</li> </ul>	<p>Minimise the disturbance on the flora and fauna environment.</p>	<ul style="list-style-type: none"> <li>• The contractor is to draw up a plan for submission to the ECO (independent Environmental Control Officer) and the mine indicating the locations of construction infrastructure camps, equipment cleaning areas, toilets, stores, office, and “no-go” areas.</li> <li>• The contractor is to ensure that all employees, including sub-contractors and their employees, attend on-site Environmental Awareness Training prior to commencing work on site.</li> <li>• Site clearing is to be limited to only the area necessary for carrying out the specified works.</li> <li>• Habitat and sensitivity maps must be used as a decision tool to guide the proposed development</li> <li>• The mine, with the assistance of a qualified botanist (or qualified ECO), should familiarise themselves with the “declining”, “near-threatened” and protected plant species occurring on the mine area or those likely to occur on-site.</li> <li>• The site should be inspected in spring or in summer in order to identify individuals/populations that might have been previously missed;</li> <li>• All protected plant species should, where possible, be left <i>in situ</i>, but if threatened by the pipeline development, be removed (with the relevant permits) and temporarily placed within an on-site nursery for re-establishment after construction;</li> <li>• If any faunal species of conservation concern is exposed during the development, all activities in the direct vicinity of the animal should be halted. The Environmental Manager shall be informed, who shall then issue instructions for its capture, translocation and safe release to adjacent suitable habitat (with the necessary permits and permission from the local authorities); Large trees (including dead tree) should be retained on site since these provide potential breeding and roosting habitat for Red-billed Oxpeckers.</li> <li>• Where electric cables or earth wires associated with the pipeline cross important roosting and dispersal networks for birds (e.g. drainage lines, impoundments or wetland systems), these should be marked with appropriate bird deterrent devices (e.g. the Double Loop Bird Flight Diverter; www. preformedsa.co.za).</li> <li>• All outside lighting should be directed away from important dispersal networks;</li> <li>• All labour or staff should be advised (induction) by means of environmental awareness training on the importance of the area, the intentional killing of any faunal species, harvesting of plant material and the feeding of animals, which is prohibited.</li> <li>• Signage should be applied to remind people of the dangers associated with feeding of wild animals. Proper animal-proof dustbins should be used.</li> <li>• All construction workers shall be issued with ID badges and clearly identifiable uniforms.</li> <li>• Workers shall remain on the site at all times during the work day and no one will be allowed to leave site by foot.</li> <li>• Environmental signage is to be displayed on the site including – “no smoking”, “fire hazards”, etc.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Construction Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis.</p> <p>ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.</p>	<p>During the Construction Phase.</p>	<ul style="list-style-type: none"> <li>• Construction Contractor</li> <li>• Mine Engineer</li> <li>• Environmental Manager</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
<p>Site preparation and construction of pipeline and associated infrastructure (including excavation, dozing, grading and installation activities). <i>Associated infrastructure relates to pump houses, sumps, power lines, and service roads.</i></p>	<p>Clearance of vegetation</p>	<p>The clearance of vegetation for preparation purposes may result in an impact on sensitive landscapes, such as wetland functioning and subsequently on the aquatic habitat associated with the wetland. A Wetland Assessment: was conducted by AGES in November 2011 for the proposed Nokeng Fluorspar Mine, which will be located on the surface rights area of Vergenoeg Mining Company. The proposed location of the pipeline and associated infrastructure for this project falls within the northern section of the Wetland Assessment's study. The valley bottom (drainage line) area between the Blue dam and Red dam is classified as a valley bottom system that forms a tributary of the Elands River. The overall Present Ecological State of the wetland is assessed as a Category D, which implies a largely modified wetland system. The ecological importance and sensitivity was scored as high. All the alternatives in terms of pipeline locations that were considered during the Scoping and EIA Phases will cross the wetland at some stage and each have thus been considered in terms of potential impacts on the wetland.</p>	<p>Appoint an Environmental Control Person (ECO) and document and communicate responsibilities</p>	<ul style="list-style-type: none"> <li>The mine shall appoint an Environmental Control Officer (ECO) (independently appointed person) with a relevant qualification during the Construction Phase;</li> <li>Site clearing is to be limited to only the area necessary for carrying out the specified works.</li> <li>The Environmental Manager will ensure that the contractor is aware of all the specifications pertaining to the project,</li> <li>Training is to cover all aspects of the EMP procedures to be followed, the sensitivity of the site and importance of adhering to "no-go" areas such as the wetland.</li> <li>Any damage to the environment will be repaired as soon as possible after consultation between the ECO, Environmental Manager, Engineer and Contractor,</li> <li>The Environmental Manager will ensure that the project staff and/or contractor are adhering to all stipulations of the Rehabilitation Management Plan.</li> <li>The ECO will be responsible for monitoring the rehabilitation works throughout the project by means of site visits and meetings. All site visits and meetings will be documented as part of the site meeting minutes which will be made available for inspection at any time;</li> <li>The Environmental Manager will ensure that all clean up and rehabilitation or any remedial actions required during the Construction Phase are completed swiftly as and when required.</li> <li>The contractor should not be permitted to leave site until the rehabilitation works have been signed off by a suitably qualified ECO.</li> <li>Employees, including sub-contractors, must be trained to operate specific equipment and have the necessary competency certificates. This must be done prior to work commencing on-site.</li> <li>The ECO shall monitor employees and contractor's compliance with the requirement to provide sufficient environmental awareness training to all site staff.</li> <li>Construction workers must adhere to Health, Safety and Environmental procedures of the mine.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Construction Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis.</p> <p>ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.</p>	<p>During the Construction Phase.</p>	<ul style="list-style-type: none"> <li>General Manager</li> <li>Environmental Manager</li> <li>ECO</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
<p>Site preparation and construction of pipeline and associated infrastructure (including excavation, dozing, grading and installation activities). <i>Associated infrastructure relates to pump houses, sumps, power lines, and service roads.</i></p>	<p>Clearance of vegetation</p>	<p>The clearance of vegetation could pose an impact on sensitive rocky ridges within the study area in terms of disturbance to biodiversity and habitat. Ridges with undisturbed vegetation can be described as ideal python habitat. An ecological evaluation was conducted in 2011 for the proposed project. As pipeline locations</p>	<p>Establish and implement a Biodiversity Management Plan for the conservation of sensitive areas and protected fauna and flora species, as well as for the eradication of alien invasive vegetation</p>	<ul style="list-style-type: none"> <li>Record plan of action regarding sensitive landscapes, habitats and fauna and flora species (including alien vegetation eradication) in a Biodiversity Action Plan and implement such plan.</li> <li>Sumps will be constructed of sufficient capacity to contain spillages as well as rain water during a storm event.</li> <li>The access road should be constructed using cut-and-fill techniques to limit disturbance as well as to optimize rehabilitation objectives.</li> </ul>			



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Site preparation and construction of pipeline and associated infrastructure (including excavation, dozing, grading and installation activities). <i>Associated infrastructure relates to pump houses, sumps, power lines and service roads.</i>	Clearance of vegetation	The establishment of alien invasive vegetation, which may result in the following: <ul style="list-style-type: none"> <li>Displacement of indigenous vegetation,</li> <li>Change in plant species composition,</li> <li>Change in vegetation composition and structure,</li> <li>Competition for sunlight and living space between indigenous and alien species, as well as for water and minerals.</li> </ul>	Establish and implement a Biodiversity Management Plan for the conservation of sensitive areas and protected fauna and flora species, as well as for the eradication of alien invasive vegetation	<ul style="list-style-type: none"> <li>Eradicate alien invasive species as per a detailed eradication programme and continued monitoring of the effectiveness of removal of alien invasive species.</li> <li>The road reserve should be kept free (by means of regular monitoring and intervention) of noxious weed (Category 1) species.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Construction Phase.  Dust monitoring reporting to be done on a quarterly basis  ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Potential destruction of heritage or archaeological resources	The potential does exist for heritage or archaeological resources to be exposed during excavation and other construction related activities. This could potentially lead to these resources being destroyed.	Establish and implement a Heritage Resources procedure or work instruction	<ul style="list-style-type: none"> <li>Develop a Heritage Resources procedure with instructions in the case heritage resources are found on-site. Also make reference to the applicable legislative requirements (e.g. permit applications) Implement an awareness campaign on the above-mentioned instructions.</li> </ul>		During the Pre-construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	The storage, mixing and disposal of cement and concrete	Potential concrete and cement spillages.	To prevent the contamination of soil and water as a result of concrete and cement used on site.	<ul style="list-style-type: none"> <li>No mixing of concrete or cement directly on the ground is permitted. The mixing of concrete will only be done on mortarboards (dugga-boards).</li> <li>Ready-mix trucks are not permitted to clean chutes on site.</li> <li>Both used and unused cement bags are to be stored in weatherproof containers so as not to be affected by rain or runoff.</li> <li>Contaminated soil resulting from concrete or cement spills, is to be removed immediately after the spillage has occurred and placed on the appropriate containers on-site.</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
Drilling and blasting activities	Generation of dust during potential drilling and blasting activities	Generation of dust as a result of drilling activities during the Construction Phase which could lead to air pollution. It is however anticipated that this impact will have a short duration (i.e. during Construction Phase).	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to dust). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>	ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Generation of nuisance noise and vibration as a result of potential drilling and blasting activities	Generation of potential environmental noise as a result of drilling activities which could result in nuisance to surrounding communities. It is however anticipated that this impact will have a short duration (i.e. during Construction Phase).	Ensure that potential environmental noise and vibration levels are controlled	<ul style="list-style-type: none"> <li>Implement an effective blast management plan</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to dust). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> <li>Implement an environmental noise monitoring programme.</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
		Generation of potential vibration damage to surrounding communities as a result of blasting activities.					



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Use and maintenance of vehicles and machinery for the construction of berms and surface water management measures in preparation for the disposal of waste rock during the Construction Phase	Potential ineffective maintenance of vehicles or machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.  Construction Phase impacts on air pollution would be limited to vehicle-related emissions during the Construction Phase resulting in air pollution.  Potential depletion of a natural resource (fuel / diesel).	Implement effective spill and handling planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Construction Phase.  Dust monitoring reporting to be done on a quarterly basis	During the Construction Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
	Generation of dust as a result of the use of vehicles and machinery for construction purposes	Generation of dust from vehicles and machinery during the Construction Phase is certain to occur. However, it is unlikely that this will contribute significantly to the overall dust impact of the mine, if current mitigation measures at the mine (such as dust suppression) are implemented.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery for construction purposes	Potential generation of environmental noise as a result of the use of vehicles and machinery during the Construction Phase activities.	Ensure that potential environmental noise levels are controlled.	<ul style="list-style-type: none"> <li>Implement an environmental noise monitoring programme.</li> <li>Ensure effective maintenance of vehicles and machinery.</li> <li>Equip machinery (where possible) with silencers.</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to noise). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>	ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Generation, storage and disposal of waste	Potential incorrect storage or disposal of waste on-site	<p>Potential incorrect disposal of building rubble resulting in soil, surface and groundwater pollution, depletion of landfill space or wastage of re-usable material</p> <p>Potential illegal dumping or incorrect disposal of waste such as cement bags, scrap metal, domestic waste or contaminated soil or hydrocarbons resulting in potential soil, surface or groundwater pollution, visual impacts in terms of littering or illegal dumping, potential depletion of landfill space or wastage of recyclable or re-usable material.</p>	Establish an effective waste management system	<ul style="list-style-type: none"> <li>Establish a waste separation system at the mine.</li> <li>Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>Implement a waste awareness training programme.</li> <li>Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>Adherence to the mine's waste procedure.</li> <li>All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Construction Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis.</p>	During the Construction Phase.	Environmental Manager
Sloping and leveling of road surfaces	Change in topography and surface water flow patterns as a result of sloping of road surfaces	The sloping of the road surfaces in order to serve as storm water management measures will lead to a change in topography. This will result in altered surface water flow patterns. If measures are not constructed / sloped correctly this could ultimately result in soil erosion.	Implement the measures as contained in the Storm Water Management Plan, dated July 2013, as well as the National Water Act (NWA) (Act 36 of 1998) and GN704, dated June 1999.	<ul style="list-style-type: none"> <li>Comply with the requirements of GN 704, dated 1999, and implement the measures as contained in the Storm Water Management Plan, dated July 2013</li> <li>Infrastructure will be constructed and maintained so as to comply with the requirements contained in the National Water Act (NWA) (Act 36 of 1998) and the GN704, dated June 1999. This includes the following requirements:                             <ul style="list-style-type: none"> <li>Construct the necessary erosion control measures to control surface water run-off from the area.</li> <li>Conduct regular site inspections in order to verify the effectiveness of the water separation system, compliance to legislation and to identify possible erosion.</li> </ul> </li> </ul>	ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
Utilisation of water.	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>Leaking water taps and hosepipes must be repaired immediately.</li> <li>Running water taps and hosepipes must not be left unattended.</li> <li>All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>Implement and awareness campaign regarding water use.</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
Provision of ablution facilities.	Potential inadequate provision of ablution facilities on-site.	Potential soil, surface - and ground water pollution. Potential health risks	To prevent the contamination of the soil, surface water and groundwater.	<ul style="list-style-type: none"> <li>Sufficient ablution facilities shall be provided.</li> <li>The contractor's camp will be in close proximity to the ablution / toilet facilities.</li> <li>Toilets should have properly closing doors and supplied with toilet paper.</li> <li>The mine, as well as the contractor, is to ensure that no spillage occurs and that the contents are removed from site according to approved methods (where relevant)</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>
Additional General Mitigation Measures:				<ul style="list-style-type: none"> <li>The ECO to conduct a post-construction audit in order to verify compliance and sign-off of activities from Construction Phase to Operational Phase.</li> </ul>	ECO to submit a report to the Government Department subsequent to the completion of the post-construction audit.	Post-Construction (prior to Operational Phase)	<ul style="list-style-type: none"> <li>ECO</li> </ul>





5.1.3 Operational Phase

Table 3: EMP - Pipeline and associated infrastructure (Operational Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Use and maintenance of vehicles and machinery during the Operational Phase	Potential ineffective maintenance of vehicles or machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
		Operational Phase impacts on air pollution would be limited to vehicle-related emissions resulting in air pollution.					
		Potential depletion of a natural resource (fuel / diesel).					
Use and maintenance of vehicles and machinery during the Operational Phase	Generation of dust as a result of the use of vehicles and machinery and maintenance purposes during the Operational Phase	The use of vehicles and machinery during the Operational Phase for inspection and maintenance purposes is anticipated to generate dust.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>	Dust monitoring reporting to be done on a quarterly basis	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery and for maintenance purposes during the Operational Phase	An environmental noise impact may occur during the Operational Phase as a result of the use of vehicles for inspection and maintenance activities.	Ensure that potential environmental noise levels are controlled.	<ul style="list-style-type: none"> <li>Implement an environmental noise monitoring programme.</li> <li>Ensure effective maintenance of vehicles and machinery.</li> <li>Equip machinery (where possible) with silencers.</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to noise). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
Generation, storage and disposal of waste during the Construction, Operational and Decommissioning Phases	Potential incorrect storage or disposal of waste on-site	Potential illegal dumping or incorrect disposal of waste such cement bags, scrap metal, domestic waste or contaminated soil or hydrocarbons resulting in potential soil, surface or groundwater pollution, visual impacts in terms of littering or illegal dumping, potential depletion of landfill space or wastage of recyclable or re-usable material.	Establish an effective waste management system	<ul style="list-style-type: none"> <li>Establish a waste separation system at the mine.</li> <li>Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>Implement a waste awareness training programme.</li> <li>Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>Adherence to the mine's waste procedure.</li> <li>All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Sloping , leveling and maintenance of road surfaces	Change in topography and surface water flow patterns as a result of sloping of road surfaces	Impact in terms of altered surface water flow patterns will continue during the Operational Phase. If measures are not maintained adequately, this could ultimately result in soil erosion.	Implement the measures as contained in the Storm Water Management Plan, dated July 2013, as well as the National Water Act (NWA) (Act 36 of 1998) and GN704, dated June 1999.	<ul style="list-style-type: none"> <li>Comply with the requirements of GN 704, dated 1999, and implement the measures as contained in the Storm Water Management Plan, dated July 2013</li> <li>Infrastructure will be maintained so as to comply with the requirements contained in the National Water Act (NWA) (Act 36 of 1998) and the GN704, dated June 1999. This includes the following requirements:                             <ul style="list-style-type: none"> <li>Maintain the necessary erosion control measures to control surface water run-off from the area.</li> <li>Conduct regular site inspections in order to verify the effectiveness of the water separation system and to identify possible erosion</li> </ul> </li> <li>The access road should be constructed using cut-and-fill techniques to limit disturbance as well as to optimize rehabilitation objectives..</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
Operation and maintenance of pipeline and associated critical equipment, such as sumps, pump houses and the Seepage pond	Potential failure of critical equipment and infrastructure	Potential spillages or leakages of hydrocarbons from the pumps at the pump houses (located in the vicinity of the Plant and at the Tailings storage facility, respectively). This could lead to soil, surface or groundwater pollution, however, this impact is rated low as only a small volume of hydrocarbon spillage or leakage is anticipated, should this impact occur.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for all critical pollution control equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> <li>Implement an environmental awareness programme in terms of spill management.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.  Groundwater monitoring to be continued on a monthly basis.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
		The presence of the pipeline infrastructure, along with the power line will result in a visual impact. However, the pipeline infrastructure will be located within the existing mine boundary area. It is therefore not anticipated that the visual impact will be of a significant nature when evaluating it along with the already existing infrastructure on the mine.	Reduce visual impact as far as possible	<ul style="list-style-type: none"> <li>Make use of visual screening berms, other structures or trees (where possible) in areas where there are sensitive receptors.</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.	During the Operational Phase	<ul style="list-style-type: none"> <li>Mine Engineer</li> <li>Environmental Manager</li> </ul>
		Potential inadequate maintenance of sumps situated within the valley floor for the purpose of containing tailings spillages from the pipeline. This could result in siltation and reduced capacity of the sumps and a subsequent increase of silt towards the Red dam.	Implement an effective inspection and planned maintenance system	<ul style="list-style-type: none"> <li>Conduct daily site inspections at sumps during start up in order to verify the effectiveness, capacity and the need for maintenance.</li> </ul>	ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Operational Phase	<ul style="list-style-type: none"> <li>Mine Engineer</li> </ul>
		Potential siltation of the Seepage Pond located at the Tailings Storage Facility No. 5 resulting in a decrease in capacity of the pond.	Implement pollution prevention measures	<ul style="list-style-type: none"> <li>Conduct regular inspections at Seepage Pond to verify the effectiveness and capacity and the need for maintenance.</li> <li>Ensure that a proper lining is used at the Seepage Pond for pollution prevention.</li> <li>Continue with groundwater monitoring programme.</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>Mining and Resources Manager</li> <li>Environmental Manager</li> </ul>
		Potential leaching (seepage) from the Seepage Pond located at the Tailings Storage Facility No.5, resulting in potential groundwater pollution.					
		Potential fire hazard due to clearance and temporary storage of vegetation for maintenance activities along the pipeline and power line routes.	Establish and implement an Emergency Preparedness and Response Procedure	<ul style="list-style-type: none"> <li>Implement an effective vegetation clearance and maintenance procedure or work instruction</li> <li>Implement Emergency Preparedness and Response procedures.</li> <li>Ensure that vehicles are equipped with the necessary emergency response equipment.</li> <li>Emergency numbers are to be clearly displayed</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>Mine Engineer</li> <li>Environmental Manager</li> <li>SHEQ Training and Personnel Practitioner</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Operation and maintenance of pipeline and associated critical equipment, such as sumps, pump houses and the Seepage pond.	Potential failure of critical equipment and infrastructure	Potential return water pipe bursts or leakages resulting in soil, surface and groundwater pollution.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for all critical pollution control equipment.</li> <li>Implement an effective incident reporting and Emergency preparedness and response procedure</li> <li>Contingency measures in case of power outages will include a designated lined sump for the containment of tailings spillages. This sump will have a solid concrete floor to stabilise the floor and allow for effective cleaning. Tailings from the sump area will be pumped back into the pump house balancing tank once power is restored, and from there the pumping process will return to normal operation.</li> <li>This sump will be constructed and maintained of sufficient capacity to contain spillages as well as rain water during a storm event in the Operational Phase.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.</p> <p>ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.</p>	During the Operational Phase	<ul style="list-style-type: none"> <li>Mine Engineer</li> <li>Environmental Manager</li> <li>SHEQ Training and Personnel Practitioner</li> </ul>
		Potential tailings pipe bursts or spillages during power or pump failures resulting in soil, surface and groundwater pollution.					<ul style="list-style-type: none"> <li></li> </ul>
Utilisation of water	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>Leaking water taps and hosepipes must be repaired immediately.</li> <li>Running water taps and hosepipes must not be left unattended.</li> <li>All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>Implement and awareness campaign regarding water use.</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>



5.1.4 Decommissioning Phase

Table 4: EMP - Pipeline and associated infrastructure (Decommissioning Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Use and maintenance of vehicles and machinery during the Decommissioning Phase	Potential ineffective maintenance of vehicles or machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Decommissioning Phase.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
		Decommissioning impacts on air pollution would be limited to vehicle-related emissions resulting in air pollution.					
		Potential depletion of a natural resource (fuel / diesel).					
Generation of dust as a result of the use of vehicles and machinery during the Decommissioning Phase	Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery	The use of vehicles and machinery during the Decommissioning Phase is anticipated to generate dust.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>	Dust monitoring reporting to be done on a quarterly basis	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
		An environmental noise impact may occur during the Decommissioning Phase as a result of the use of vehicles and machinery.	Ensure that potential environmental noise levels are controlled.	<ul style="list-style-type: none"> <li>Implement an environmental noise monitoring programme.</li> <li>Ensure effective maintenance of vehicles and machinery.</li> <li>Equip machinery (where possible) with silencers.</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to noise). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis during the Decommissioning Phase.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
Generation, storage and disposal of waste during the Construction, Operational and Decommissioning Phases	Potential incorrect storage or disposal of waste on-site	<p>Potential incorrect disposal of building rubble resulting in soil, surface and groundwater pollution, depletion of landfill space or wastage of re-usable material</p> <p>Potential illegal dumping or incorrect disposal of waste such cement bags, scrap metal, domestic waste or contaminated soil or hydrocarbons resulting in potential soil, surface or groundwater pollution, visual impacts in terms of littering or illegal dumping, potential depletion of landfill space or wastage of recyclable or re-usable material.</p>	Establish an effective waste management system	<ul style="list-style-type: none"> <li>Establish a waste separation system at the mine.</li> <li>Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>Implement a waste awareness training programme.</li> <li>Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>Adherence to the mine's waste procedure.</li> <li>All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	ECO to report to the Government Department on a quarterly basis (during the Decommissioning Phase) on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Sloping , leveling and maintenance of road surfaces	Change in topography and surface water flow patterns as a result of sloping of road surfaces	The re-sloping of road surfaces during the Decommissioning Phase will cause a change in topography and yet another alteration to surface water flow patterns. This could subsequently lead to soil erosion.	Implement the measures as contained in the Storm Water Management Plan, dated July 2013, as well as the National Water Act (NWA) (Act 36 of 1998) and GN704, dated June 1999.	<ul style="list-style-type: none"> <li>Comply with the requirements of GN 704, dated 1999, and implement the measures as contained in the Storm Water Management Plan, dated July 2013.</li> <li>Infrastructure will be removed and the area will be sloped so as to comply with the requirements contained in the National Water Act (NWA) (Act 36 of 1998) and the GN704, dated June 1999, as well as the rehabilitation requirements as committed to in the rehabilitation plan of the mine.</li> <li>Construct the necessary erosion control measures to control surface water run-off from the area.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Decommissioning Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis during the Decommissioning Phase.</p>	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
Utilisation of water	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>Leaking water taps and hosepipes must be repaired immediately.</li> <li>Running water taps and hosepipes must not be left unattended.</li> <li>All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>Implement and awareness campaign regarding water use.</li> </ul>	<p>ECO to report to the Government Department on a quarterly basis (during the Decommissioning Phase) on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.</p>		<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>



## 5.2 Waste Rock Dump

### 5.2.1 Planning and Design Phase

Table 5: EMP –Waste Rock Dump (Planning and Design Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Design and planning of the proposed Waste Rock Dump and associated infrastructure	Inadequate planning and design.	Impacts on the environment that could potentially have been avoided.	To effectively plan and design the Waste Rock Dump and associated infrastructure taking the on-site environment into consideration.	<ul style="list-style-type: none"> <li>• Site selection for the proposed activities must include consideration of the following:                             <ul style="list-style-type: none"> <li>➢ Sloping / gradient factors.</li> <li>➢ Design and construction of surface water management and erosion control measures as per environmental legislation.</li> <li>➢ Access to and from the proposed site.</li> <li>➢ The location of nearby drainage systems, watercourses and sensitive landscapes.</li> <li>➢ The habitats of fauna and flora species.</li> <li>➢ Protected plant and tree species.</li> <li>➢ Available water supplies.</li> <li>➢ Security and general service facilities in the area.</li> <li>➢ Future expansions / phases.</li> <li>➢ General housekeeping practices.</li> <li>➢ Existing mine procedures, Government Authority requirements and permit conditions.</li> <li>➢ Possible heritage or archaeological resources on-site.</li> <li>➢ Soil types and land capability.</li> <li>➢ Surface- and groundwater quality (pre-project status) and possible impacts that would result from proposed activities.</li> </ul> </li> </ul> <p>The above listed information must be recorded before the construction at the site commences and should be used for future monitoring purposes.</p>	Vergenoeg Mine must verify that the indicated factors have been considered during site selection for the proposed activities	Complete prior to Construction Phase.	<ul style="list-style-type: none"> <li>• Mining and Resources Manager</li> <li>• Environmental Manager</li> <li>• Specialists (where required)</li> <li>• Mine Engineer</li> </ul>



5.2.2 Pre-construction and Construction Phase

Table 6: EMP- Waste Rock Dump (Pre-construction and Construction Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party			
Use and maintenance of vehicles and equipment during the Pre-construction and Construction Phases	Potential ineffective maintenance of vehicles and machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> <li>Emergency numbers are to be clearly displayed</li> </ul>	Environmental Manager to verify implementation of mitigation measures throughout the Construction Phase.	During the Construction Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Construction Contractor</li> <li>Mine Engineer</li> </ul>			
		Construction Phase impacts on air pollution would be limited to vehicle-related emissions during the Construction Phase resulting in air pollution.								
		Potential depletion of a natural resource (fuel / diesel).								
	Generation of dust as a result of the use of vehicles for hauling of waste rock during the Operational Phase	Generation of dust from vehicles and machinery during the Construction Phase is certain to occur. However, as per the Air Quality Impact Study conducted, it is unlikely that this will contribute significantly to the overall dust impact of the mine, if current mitigation measures at the mine (such as dust suppression) are implemented for this activity	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>	Dust monitoring reporting to be done on a quarterly basis  ECO to verify implementation of mitigation measures on a monthly basis.  ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and EMP mitigation measures.	During the Construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mining and Resources Manager</li> </ul>			
								Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery	Potential generation of environmental noise as a result of the use of vehicles and machinery during the Construction Phase activities.	Ensure that potential environmental noise levels are controlled.
Increase in traffic on haul roads due to haulage of waste rock to the Waste Rock Dump										
	Pre-construction activities	Potential destruction of heritage or archaeological resources	The potential does exist for heritage or archaeological resources to be exposed during the Construction Phase. This could potentially lead to these resources being destroyed.	Establish and implement a Heritage Resources procedure or work instruction	<ul style="list-style-type: none"> <li>Develop a Heritage Resources procedure with instructions in the case heritage resources are found on-site. Also make reference to the applicable legislative requirements (e.g. permit applications) Implement an awareness campaign on the above-mentioned instructions.</li> </ul>	During the Pre-construction Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>			



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Generation, storage and disposal of waste	Potential incorrect disposal of general waste (including domestic waste and building rubble) generated during the various phases	Types of waste to be generated during the Construction Phase include: <ul style="list-style-type: none"> <li>• Cement and other material from storm water structures constructed,</li> <li>• Domestic waste generated by employees and contractors,</li> <li>• Potential hazardous waste such as hydrocarbons or contaminated soil removed due to leaking vehicles or machinery.</li> </ul> These waste types may be incorrectly separated or disposed of resulting in soil, surface water or groundwater pollution, depletion of a landfill space or the wastage of recyclable material.	Establish an effective waste management system	<ul style="list-style-type: none"> <li>• Establish a waste separation system at the mine.</li> <li>• Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>• Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>• Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>• Implement a waste awareness training programme.</li> <li>• Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>• Adherence to the mine's waste procedure.</li> <li>• All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>• Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	Environmental Manager to verify implementation of mitigation measures throughout the Construction Phase.  ECO to verify implementation of mitigation measures on a monthly basis.  ECO to report to the Government Department on a quarterly basis on compliance with the Environmental Authorisation conditions and EMP mitigation measures.	During the Pre-construction Phase.	<ul style="list-style-type: none"> <li>• Environmental Manager</li> </ul>
Utilisation of water	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>• Leaking water taps and hosepipes must be repaired immediately.</li> <li>• Running water taps and hosepipes must not be left unattended.</li> <li>• All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>• Implement and awareness campaign regarding water use.</li> </ul>		During the Construction Phase.	<ul style="list-style-type: none"> <li>• Environmental Manager</li> <li>• Mine Engineer</li> </ul>
Additional General Mitigation Measures				<ul style="list-style-type: none"> <li>• The ECO to conduct a post-construction audit in order to verify compliance and sign-off of activities from Construction Phase to Operational Phase.</li> </ul>	ECO to submit a report to the Government Department subsequent to the completion of the post-construction audit.	Post-Construction (prior to Operational Phase)	<ul style="list-style-type: none"> <li>• ECO</li> </ul>





5.2.3 Operational Phase

Table 7: EMP- Waste Rock Dump (Operational Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Use and maintenance of vehicles and equipment during the Operational Phase	Potential ineffective maintenance of vehicles and machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.  Emissions from vehicles used during the Operational Phase resulting in air pollution  Potential depletion of a natural resource (fuel / diesel).	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.  Dust monitoring reporting to be done on a quarterly basis	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
	Generation of dust as a result of the use of vehicles for hauling of waste rock during the Operational Phase	The new waste rock stockpile site is expected to increase dust generation from the Vergenoeg Mine. The main reason for this is the increase in the distance over which the waste rock will be hauled. This will include hauling waste from the pit to the waste rock dump and use of vehicles for engineering purposes on-site. Given the limited impact on air quality outside of the mine boundary, while mitigation measures are in place, and the fact that there are few (if any) sensitive receptors in the impact zone, the current dust fall monitoring programme undertaken by the mine is sufficient.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.  ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mining and Resources Manager</li> </ul>
	Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery	An increase in environmental noise is anticipated as a result of increased vehicle movement for hauling of waste rock during the Operational Phase.	Ensure that potential environmental noise levels are controlled.	<ul style="list-style-type: none"> <li>Implement an environmental noise monitoring programme.</li> <li>Ensure effective maintenance of vehicles and machinery.</li> <li>Equip machinery (where possible) with silencers.</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to noise). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Use and maintenance of vehicles and equipment during the Operational Phase	Increase in traffic on haul roads due to the use of the new Waste Rock Dump	Traffic within the mine boundary area will increase during the Operational Phase due to the haulage of waste rock to the new proposed Waste Rock Dump. Potential safety impacts associated with this aspect relate to potential vehicle accidents.	Implement a traffic control and safety procedure	<ul style="list-style-type: none"> <li>Educate employees on the safety precautions on haul roads as part of an awareness programme.</li> <li>Place signage to create awareness on-site.</li> <li>Implement an emergency preparedness and response procedure.</li> <li>Emergency numbers are to be clearly displayed</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>SHEQ Training and Personnel Practitioner</li> </ul>
Deposition of waste rock	Change in topography as a result of the deposition of waste rock during the Operational Phase	The deposition of waste will result in a change in topography which may increase the existing visual impact of the mine operations. The waste rock dump will however be situated within the existing mine boundary area (Preferred Alternative: west of the existing tailings storage facilities; and Alternative 1: north of the existing tailings storage facilities). Both the Alternatives are considered be of a low visual impact due to the absorption capacity of the area being high with Bushveld trees and shrubs camouflaging the activities in the area.	Implement the measures as contained in the Storm Water Management Plan, dated July 2013.	<ul style="list-style-type: none"> <li>Make use of visual screening berms or other structures or trees (where possible) in areas where there are sensitive receptors.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.</p> <p>ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP</p>	During the Operational Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>
		Surface water flow patterns will be altered as a result of the change in topography due to waste rock deposition activities. An increase in surface water flow will occur resulting in possible siltation of surrounding water courses or management structures.		<ul style="list-style-type: none"> <li>Comply with, and implement the measures as contained in the Storm Water Management Plan, dated July 2013. I.e. proper storm water management measures to be implemented around the proposed Waste Rock Dump to ensure the containment and diversion of surface water runoff from the Waste Rock Dump. This includes cut-off berms and evaporation paddocks on the western and southern sides of the facility.</li> <li>The site water balance will be refined on an ongoing basis with the input of actual flow volumes and used as decision-making tool for water management on the mine.</li> <li>Conduct regular site inspections at the Waste Rock Dump in order to verify the effectiveness and capacity of the storm water management measures and the need for maintenance on surface water management structures.</li> </ul>			During the Operational Phase



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Deposition of waste rock	Potential inadequate storm water management around Waste Rock Dump	<p>If not managed adequately, clean and dirty water, management areas will not be separated effectively and could result in the contamination of surrounding clean water areas.</p> <p>The change in surface water flow patterns may result in increased erosion conditions, if not managed appropriately. This could lead to increased solids in water systems and subsequent siltation of the surrounding watercourses or water management systems (drainage channels).</p>	Implement an effective surface water management, monitoring and erosion control system in order to comply with GN704, dated 1999 in terms of the separation of clean and dirty water management areas.	<ul style="list-style-type: none"> <li>Comply with the requirements of GN 704, dated 1999, and implement the measures as contained in the Storm Water Management Plan, dated July 2013. I.e. proper storm water management measures to be constructed and maintained around the proposed Waste Rock Dump to ensure the separation of clean- and dirty water management areas. This includes cut-off berms and evaporation paddocks on the western and southern sides of the facility.</li> <li>Infrastructure will be constructed and operated so as to comply with the requirements contained in the National Water Act (NWA) (Act 36 of 1998) and the GN704, dated June 1999. This includes the following requirements:                             <ul style="list-style-type: none"> <li>Construct the necessary erosion control measures (e.g. grass, cement, rock, appropriate benches on the side walls of WRD), to control surface water run-off from the area.</li> <li>Conduct regular site inspections at the Waste Rock Dump in order to verify the effectiveness of the water separation system and to identify possible erosion.</li> <li>Monitor surface water quality on a monthly basis, including the quality of the Blue (clean water) dam.</li> </ul> </li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.	During the Operational Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>
	Potential leaching from Waste Rock Dump	The potential exists for the leaching of contaminants to the groundwater regime. However, a geochemical characterisation of the waste rock, indicated that the waste rock is not acid forming, and limited leachate of salts into the groundwater is shown during worst case scenario with acid rain.	Implement an effective water monitoring programme incident management system and pollution prevention measures.	<ul style="list-style-type: none"> <li>Vergenoeg Mining Company will comply with the NWA, 1998 and the GN704 Regulations, dated June 1999. The WRD and its associated infrastructure will be designed and operated so as to comply with the following principles:                             <ul style="list-style-type: none"> <li>Pollution prevention through basic infrastructure design,</li> <li>Pollution prevention through maintenance of infrastructure,</li> <li>The required steps to enable containment and remediation of pollution incidents, and</li> <li>Continue to monitor groundwater quality in terms of the existing groundwater-monitoring programme.</li> </ul> </li> </ul>	Surface- and groundwater monitoring to be continued on a monthly basis.	During the Operational Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>
	Loss of natural vegetation and ecological function as a result of waste rock deposition and the subsequent establishment of alien invasive vegetation	<p>As per the Ecological Assessment conducted, vegetation will be lost with the construction and operation of the Waste Rock Dump. This will result definite loss of ecological function and biodiversity.</p> <p>The establishment of alien invasive vegetation, which may result in the following:</p> <ul style="list-style-type: none"> <li>Displacement of indigenous vegetation,</li> <li>Change in plant species composition,</li> <li>Change in vegetation composition and structure,</li> </ul> <p>Competition for sunlight and living space between indigenous and alien species, as well as for water and minerals.</p>	Establish and implement a Biodiversity Management Plan for the conservation of protected fauna and flora species and the eradication of alien invasive vegetation	<ul style="list-style-type: none"> <li>Habitat and sensitivity maps must be used as a decision tool to guide the proposed development.</li> <li>The drainage line (<i>Combretum apiculatum – Dichrostachys cinerea woodland</i>) on the WRD site should be preserved. Access should be controlled at all times.</li> <li>The mine, with the assistance of a qualified botanist (or qualified ECO), should familiarise themselves with the “declining”, “near-threatened” and protected plant species occurring on the mine area or those occur likely to occur on the study site.</li> <li>The site should be inspected in spring or in summer in order to identify individuals/populations that might have been previously missed;</li> <li>All protected plant species should, where possible, be left <i>in situ</i>, but if threatened by the WRD development, be removed (with the relevant permits) and temporarily placed within an on-site nursery for re-establishment after construction;</li> <li>If any faunal species of conservation concern is exposed during the development, all activities in the direct vicinity of the animal should be halted. The ECO shall be informed, who shall then issue instructions for its capture, translocation and safe release to adjacent suitable habitat (with the necessary permits and permission from the local authorities); Large trees (including dead tree) should be retained on site since these provide potential breeding and roosting habitat for Red-billed Oxpeckers.</li> <li>All outside lighting should be directed away from important dispersal networks;</li> <li>All labour or staff should be advised (induction) by means of environmental awareness training on the importance of the area, the intentional killing of any faunal species, harvesting of plant material and the feeding of animals, which is prohibited.</li> <li>Signage should be applied to remind people of the dangers associated with feeding of wild animals. Proper animal-proof dustbins should be used.</li> <li>Eradicate alien invasive species as per a detailed eradication programme and continued monitoring of the effectiveness of removal of alien invasive species.</li> <li>Investigate the possibility of a biodiversity off-set project, which will take into account the size and conservation status of the area, the offset ration, evaluation of alternative offset sites, acceptability to key stakeholders, conservation importance, and distance from other mines and development activities.</li> </ul>	<p>ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.</p> <p>ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP</p>	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mining and Resources Manager</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Deposition of waste rock:	Potential destruction of heritage or archaeological resources	The potential does exist for heritage or archaeological resources to be exposed during the Operational Phase. This could potentially lead to these resources being destroyed.	Establish and implement a Heritage Resources procedure or work instruction	<ul style="list-style-type: none"> <li>Communicate and implement an awareness campaign providing instructions (as per legislative requirements) on what needs to be done should heritage or archaeological resources be found on-site.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Potential incorrect deposition of waste rock resulting in instability of WRD	<p>Potential instability of the WRD resulting from potential incorrect deposition of waste rock, could subsequently lead to rock falls and safety impacts for employees, visitors, community members etc.</p> <p>The potential deposition of waste rock beyond the footprint boundaries of the WRD could result in a larger area being impacted on in terms of ecological functioning and contamination of the surrounding environment.</p>	Implement a self evaluation programme in order to verify compliance with legislative requirements, conditions, and mine procedures in terms of waste rock deposition	<ul style="list-style-type: none"> <li>Ensure that safety aspects are taken into consideration during the initial stages of waste rock deposition planning.</li> <li>Emergency numbers are to be clearly displayed.</li> <li>Conduct regular site inspections in order to verify the correct waste rock deposition methods / phases as well as in relation to the approved footprint area.</li> <li>Implement strict access control in the vicinity of the WRD.</li> </ul>		During the Operational Phase	<ul style="list-style-type: none"> <li>SHEQ Training and Personnel Practitioner</li> <li>Mining and Resources Manager</li> <li>Environmental Manager</li> </ul>
	Potential dust generation from Waste Rock Dump	From the figures presented in the Air Quality Impact Assessment (refer to Annexure G10), haul roads and open pit operations are the largest causes of particulate emissions. The new WRD, while it will have a substantially larger capacity, will not generate significantly more dust than the existing waste rock stockpile. Compared with emissions from current mining activities at the Vergenoeg Mine the main increase in emissions resulting from the new WRD are caused by its location – the haulage vehicles will be required to travel a greater distance, thereby creating increased fugitive dust emissions.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure                             <ul style="list-style-type: none"> <li>Continue with the current dust monitoring programme in order to verify the mine's dust sources and compliance to legislative limits</li> </ul> </li> </ul>	<p>Report on dust monitoring results on a quarterly basis.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.</p> <p>ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP</p>	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
	Potential incorrect disposal of general waste (including domestic waste and building rubble) generated during the various phases	<p>Types of waste to be generated during the Operational Phase include:</p> <ul style="list-style-type: none"> <li>Domestic waste generated by employees and contractors,</li> <li>Potential hazardous waste such as hydrocarbons or contaminated soil removed due to leaking vehicles or machinery.</li> </ul> <p>These waste types may be incorrectly separated or disposed of resulting in soil, surface water or groundwater pollution, depletion of a landfill space or the wastage of recyclable material.</p>	Implement an effective waste management system.	<ul style="list-style-type: none"> <li>Establish a waste separation system at the mine.</li> <li>Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>Implement a waste awareness training programme.</li> <li>Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>Adherence to the mine's waste procedure.</li> <li>All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	During the Operational Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>	



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance and reporting	Timeframes	Responsible Party
Utilisation of water	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>Leaking water taps and hosepipes must be repaired immediately.</li> <li>Running water taps and hosepipes must not be left unattended.</li> <li>All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>Implement and awareness campaign regarding water use.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed in this EMP throughout the Operational Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on an annual basis.</p> <p>ECO to report to the Government Department on an annual basis on compliance with the Environmental Authorisation conditions and mitigation measures as contained in this EMP</p>	During the Operational Phase.	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>

### 5.2.4 Decommissioning Phase

Table 8: EMP- Waste Rock Dump (Decommissioning Phase)

Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Use and maintenance of vehicles and equipment during the Decommissioning Phase	Potential ineffective maintenance of vehicles and machinery	Soil, surface and / or groundwater pollution resulting from leakages from vehicles and machinery. This impact is however anticipated to be localised within the site boundaries and of a small volume.	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Implement an effective planned maintenance system for vehicles and equipment.</li> <li>Implement an effective spill management procedure for the clean-up of leakages and spillages of hydrocarbons.</li> <li>Implement an emergency preparedness and response procedure in case of reportable incidents to Authorities.</li> </ul>	<p>Environmental Manager to verify implementation of mitigation measures proposed throughout the Decommissioning Phase.</p> <p>ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis during the Decommissioning Phase. ECO to report to the Government Department on a quarterly basis (during the Decommissioning Phase) on compliance with the Environmental Authorisation conditions and EMP mitigation measures.</p>	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Use and maintenance of vehicles and equipment during the Decommissioning Phase	Potential ineffective maintenance of vehicles and machinery	Emissions from vehicles used during the Decommissioning Phase resulting in air pollution  Potential depletion of a natural resource (fuel / diesel).	Implement effective spill handling and planned maintenance systems	<ul style="list-style-type: none"> <li>Refer to mitigation measures above.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed throughout the Decommissioning Phase.  Dust monitoring reporting to be done on a quarterly basis.  Surface water monitoring to be continued on a monthly basis.  ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis during the Decommissioning Phase.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
	Generation of dust as a result of the use of vehicles during the Decommissioning Phase	Dust generation is anticipated to occur during the Decommissioning Phase as a result of the use of vehicles and machinery for rehabilitation purposes, the removal of surface structures and sloping practices.	Implement an effective Air Quality Management Programme	<ul style="list-style-type: none"> <li>Document and implement a dust monitoring procedure</li> <li>Continue with the current dust monitoring programme</li> <li>Implement dust suppression measures on the main roads on a daily basis</li> <li>Implement strict speed limits on roads</li> </ul>		During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mining and Resources Manager</li> </ul>
	Generation of potential nuisance (environmental) noise to surrounding communities as a result of the use of vehicles and machinery	An increase in environmental noise is anticipated as a result of increased vehicle and machinery movement for during the Decommissioning	Ensure that potential environmental noise levels are controlled.	<ul style="list-style-type: none"> <li>Implement an environmental noise monitoring programme.</li> <li>Ensure effective maintenance of vehicles and machinery.</li> <li>Equip machinery (where possible) with silencers.</li> <li>Ensure the availability of a complaints register for the recording of complaints relating to noise). The complaints register must as a minimum, record the following: date when complaint was received, name of person who reported the complaint and when and how the concern was addressed.</li> </ul>		During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>
Re-sloping and rehabilitation of Waste Rock Dump	Potential inadequate storm water management around / on Waste Rock Dump	A change in surface water flow patterns during the Decommissioning Phase (as a result of sloping activities and changes to storm water management measures to re-instate a free-draining environment as part of rehabilitation) could result in an increase in suspended solids and subsequent contamination of surface water or siltation of watercourses and surrounding drainage channels.	Implement an effective surface water management, monitoring and erosion control system in order to comply with GN704, dated 1999 in terms of the separation of clean and dirty water management areas.	<ul style="list-style-type: none"> <li>Comply with the requirements of GN 704, dated 1999, and implement the measures as contained in the Storm Water Management Plan, i.e. proper storm water management measures to be maintained around the proposed Waste Rock Dump to ensure the separation of clean- and dirty water management areas (free drainage and no ponding of water).</li> <li>Infrastructure will be removed and sloping will be done so as to comply with the requirements contained in the National Water Act (NWA) (Act 36 of 1998) and the GN704, dated June 1999. This includes the following requirements:                             <ul style="list-style-type: none"> <li>Construction of the necessary erosion control measures</li> <li>Monitor surface water quality on a monthly basis, including the quality of the Blue (clean water) Dam.</li> </ul> </li> </ul>	ECO to report to the Government Department on a quarterly basis (during the Decommissioning Phase) on compliance with the Environmental Authorisation conditions and EMP mitigation measures.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>
	Potential ineffective rehabilitation and re-sloping practices	Should an inadequate amount or no organic material be worked into soil used for re-sloping / rehabilitation practices during the Decommissioning Phase, this could result in the ineffective settling of vegetation on the slopes of the Waste Rock Dump.	Develop and implement an effective rehabilitation strategy for the WRD	<ul style="list-style-type: none"> <li>Set rehabilitation objectives with regards to the Waste Rock Dump area and develop an effective and detailed rehabilitation plan for the Waste Rock Dump area, including the following:                             <ul style="list-style-type: none"> <li>Soil usage,</li> <li>Vegetation establishment,</li> <li>Removal of infrastructure,</li> <li>Sloping methods</li> <li>End land use requirements.</li> <li>Long-term erosion prevention</li> <li>Confirmatory monitoring</li> </ul> </li> <li>Rehabilitation to be done to the natural angle of repose.</li> <li>Note: Consider final rehabilitation goals in the Operational Phase.</li> </ul>		Operational to Decommissioning Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>



Activity	Aspect	Impact	Objective	Management/ Mitigation Measure	Monitoring compliance	Timeframes	Responsible Party
Re-sloping and rehabilitation of Waste Rock Dump	Potential ineffective rehabilitation and re-sloping practices such as: Inadequate amount or no organic material mixed into soil used for rehabilitation; or Incorrect sloping of Waste Rock Dump surface	The incorrect sloping of the Waste Rock Dump surface could result in increased or decreased (ponding) surface water flow patterns resulting in subsequent erosion on the side walls of the Waste Rock Dump. This could ultimately limit the growth of vegetation as part of rehabilitation, increase dust generation from the rehabilitated WRD and / or increase the runoff of suspended solids into surrounding surface water sources.		<ul style="list-style-type: none"> <li>Refer to mitigation measures above.</li> </ul>	Environmental Manager to verify implementation of mitigation measures proposed throughout the Decommissioning Phase.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Mining Resources Manager</li> <li>Environmental Manager</li> </ul>
Generation, storage and disposal of waste	Potential incorrect disposal of general waste (including domestic waste and building rubble) generated during the various phases	Types of waste to be generated during the Decommissioning Phase include: <ul style="list-style-type: none"> <li>Building rubble from the removal of surface water structures,</li> <li>Domestic waste generated by employees and contractors,</li> <li>Potential hazardous waste such as hydrocarbons or contaminated soil removed due to leaking vehicles or machinery.</li> </ul> These waste types may be incorrectly separated or disposed of resulting in soil, surface water or groundwater pollution, depletion of a landfill space or the wastage of recyclable material	Implement an effective waste management system.	<ul style="list-style-type: none"> <li>Establish a waste separation system at the mine.</li> <li>Provide the relevant waste telecons or bins for the temporary waste storage on site prior to removal off-site.</li> <li>Appropriate equipment to deal with fire incidents is to be readily available on site. Soil contaminated with hazardous substances, fuel or oil shall be treated as hazardous waste and removed from site.</li> <li>Make use of registered waste transporters and licensed waste disposal landfill sites.</li> <li>Implement a waste awareness training programme.</li> <li>Obtain and keep on file safe disposal certificates for waste disposed off site.</li> <li>Adherence to the mine's waste procedure.</li> <li>All building rubble will be disposed of at the mine's waste rock dump. This proposed activity needs to be communicated and discussed with the relevant Government Authority beforehand.</li> <li>Access will be restricted to the mine's employees who have access to the pit area which is adjacent to the Waste Rock Dump.</li> </ul>	ECO to verify implementation of mitigation measures proposed in this EMP on a monthly basis during the Decommissioning Phase.  ECO to report to the Government Department on a quarterly basis (during the Decommissioning Phase) on compliance with the Environmental Authorisation conditions and EMP mitigation measures.	During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> </ul>
Utilisation of water	Inefficient and/or redundant use of a valuable resource. The existing source (treated water from the Rust de Winter dam) will continue to be used for domestic water purposes.	Wastage of water and depletion of water resource.	To prevent the wastage of a natural resource.	<ul style="list-style-type: none"> <li>Leaking water taps and hosepipes must be repaired immediately.</li> <li>Running water taps and hosepipes must not be left unattended.</li> <li>All hose and tap connections are to be fitted with correct and appropriate plumbing fittings.</li> <li>Implement and awareness campaign regarding water use.</li> </ul>		During the Decommissioning Phase	<ul style="list-style-type: none"> <li>Environmental Manager</li> <li>Mine Engineer</li> </ul>



### **5.3 Closure Phase**

Should the mine close, the pipeline and associated infrastructure, as well as the Waste Rock Dump will also need to be decommissioned and a Closure Plan will need to be drafted that will be send to the Gauteng Department of Agriculture and Rural Development (GDARD) and Department of Mineral Resources (DMR) for approval. Closure will only commence once approval of the Closure Plan has been received.





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## 6. Environmental Awareness Plan

The following Environmental Awareness Plan must be implemented by Vergenoeg Mining Company (Pty) Ltd in order to inform their employees and contractors of the environmental risk that may result from their work. The plan must be conducted as part of the induction process for all new employees (including contractors) that will perform work in terms of the proposed activities. Proof of all training provided must be kept on-site.

The Environmental Awareness Plan is referred to as the “SHE match” training programme. The training programme focuses on the following aspects:

1. Explaining clearly what the environment is and what the environment consist of namely: air, water, soil, fauna, flora and people.
2. Once participants have grasped the description of what the environment entails, the training focuses on the potential impacts that the construction and operational activities may have on each one of these environmental components. This is done by making use of the aspect register, where each one of the environmental aspects and associated impacts has been identified.
3. To ensure that the training is effective, visual aids are used. Photos are taken of actual and potential impacts occurring on site and in some cases role-play is used to illustrate a potential impact.
4. The participants are then exposed to a poster that reflects the various environmental components. The various photos taken are posted on the poster on a rotational basis and the participants indicate (based on the visual component) what environmental component was or could have been affected by the activities portrayed on the photo.
5. By doing this the participants visualize the action as well as the potential consequence (environmental impact) of their action.
6. This General awareness training must be done before construction commences and also when new employees start work. The training should be done every two years during the Operational Phase. The poster is posted in the communal area where the impacts are visualized and the photos rotated on a monthly basis.

