
# ENVIRONMENTAL MANAGEMENT PLAN FOR PROPOSED SMALL-SCALE MINING ON MINING CLAIMS 76092, 76088, 76087, 76086, 76090 NEAR OTJAPITJAPI, OPUWO AREA, KUNENE REGION

**MEFT PROJECT NO.: 260106006859**

## TABLE OF CONTENTS



## LIST OF TABLES

# 1. BACKGROUND

Eco-Wise Environmental Consulting cc has been appointed as an independent environmental consultancy to undertake the scoping Environmental Impact Assessment (EIA), develop an Environmental Management Plan (EMP) and apply for an Environmental Clearance Certificate (ECC) for the proposed small-scale mining on mining claims 76092, 76088, 76087, 76086, 76090 near Otjapitjapi, Opuwo Area, Kunene Region.

This Environmental Management Plan (EMP) has been developed to manage all the impacts, which were identified during the environmental assessment of the project. The EMP has been developed in terms of the Environmental Management Act (EMA) No 7 of 2007 and Environmental Impact Assessment regulations of 2012. Small scale mining is listed as an activity, which cannot be undertaken without an EIA. The project therefore falls under annexure 3, mining and quarrying activities. Annexure 3.2 states that other forms of mining or extraction of any natural resources whether regulated by law or not and 3.3 resource extraction, manipulation, conservation and related activities require an EIA.

## 1.2 PROJECT ACTIVITIES

The following activities will be done under small scale mining:

### 1.2.1 CONSTRUCTION PHASE

1. **Site Preparation & Development**

- Fencing of the area
- Land clearing which will involve vegetation removal
- Topsoil stripping and stockpiling (to be used during rehabilitation)
- Upgrading of access road and preparation of cutlines when necessary

2. **Infrastructure Installation**

- Temporary office and storage structures (likely to be in the form of containers)
- Fuel storage setup

- Basic power supply (generator)
- Safety signage installation

### 1.2.2 OPERATION PHASE

**3. Mineral ore extraction by open cast mining**

- Manual digging
- Drilling- - basically selective drilling and blasting due to the hardness of the material
- Blasting
- Shallow open pit excavation
- Overburden removal
- Ore extraction
- Hauling of ore
- Stockpiling of ore
- Waste rock dumping

4. **Loading and Transportation-** Mined ore will be transported from the site to the crushers which are located off site.

### 1.2.3 DECOMMISSIONING PHASE

The main issue at this stage will be rehabilitation. All affected areas will be rehabilitated so as to try to restore the environment to what it was before. Activities which will be done include, backfilling all pits.

**Mine Closure & Rehabilitation**

- Backfilling of pits
- Removal of available infrastructure
- Re-contouring of land
- Topsoil replacement
- Revegetation
- Closure reporting

## 2. EMP AIMS AND OBJECTIVES

The environmental management plan (EMP) aims to take a pro-active route by addressing potential problems before they occur. The objectives of the EMP are therefore;

- To outline mitigation measures in order to manage environmental and socio-economic impacts associated with the project
- Provide a framework for implementing the management actions recommended in the EIA for the small-scale mining activities.
- To ensure that the project will comply with relevant environmental legislations of Namibia and other requirements throughout its activities.

## 3. POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

Legislations are used as guiding tools during the development of an EMP. The Proponent will be required to abide to different policies, laws, regulation relating to the project. The Environmental Management Act No. 7 of 2007 was the main legislative, which was used as a guiding tool during the development of the EMP. Table 1, indicate the relevant legislations related to the project.

**Table 1:** Relevant legislation and policies related to the project

| Aspect | Legislation | Relevant Provisions | Relevance to the Project |
|---|---|---|---|
| **The Constitution** | Namibian Constitution First Amendment Act 34 of 1998 | – According to article 91(c) it provides for duty to guard against 'the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia'<br>– Article 95 (l) deals with the 'maintenance of ecosystems, essential ecological processes and biological diversity' and sustainable use of the country's natural resources. | – During the proposed small scale mining activities, sustainable practices should be performed.<br>– Ensure rehabilitation of the sites after closure of the operations |
| **Environmental** | Environmental Management Act 7 of 2007 | – States that, projects with significant environmental impacts are subject to an environmental assessment process (Section 27).<br>– Requires for adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions on a project (Section 2). | – The EMA should guide the management of this project.<br>– Proper channel of communication between the project owner/s and the community should be established<br>– The public and relevant authorities should be consulted during the process of public consultation as per the requirement of the act<br>– The EMP which will guide on the management of the environment should be drafted and used as an onsite guideline document. |
| | EIA Regulations (2012) | – Lists all activities, which cannot be undertaken without an EIA. | – This project is listed under mining and quarrying activities.<br>– Activity 3.3 states that, resource extraction, manipulation, conservation and related activities require an EIA. |
| | Convention on Biological Diversity (1992) | - Article 1 lists the conservation of biological diversity amongst the objectives of the convention. | - The Proponent should consider the impact of the project on the biodiversity of the area; the MCs are |

| | | | |
|---|---|---|---|
| | | | located within the Ozondundu Conservancy |
| | Nature Conservation Ordinance No. 4 of 1975 | Chapter 6 provides for legislation regarding the protection of indigenous plants | - Indigenous and protected plants should be protected within the areas of works. |
| | Environmental Assessment Policy of Namibia (1995) | The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term "environment" is broadly interpreted to include biophysical, social, economic, cultural, historical and political components. | - The EIA considers this term of "environment". |
| | Hazardous Substances Ordinance No. 14 of 1974 | This ordinance gives provision to control the handling of hazardous substance in all circumstances | - To ensure proper handling of fuel and explosives which will be used during blasting. |
| | Petroleum Product and Energy Act No, 13 of 1990 | This Act provides a framework for handling and distribution of petroleum products which may include purchase, sale, supply, acquisition, possession, disposal, storage or transportation thereof. | - Ensure safe handling of the petroleum products such as fuel and lubricants. |
| | Minerals (Prospecting and Mining) Act,1992 (Act 33 1 of 1992) | To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. 'mineral" means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land and having been formed by, or subjected to, a geological process, excluding-(c) subject to the provision of subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of schedule 1). | - The intended activity will involve mining of copper bearing minerals, Base Metals and Precious metals. |

| | | | |
|---|---|---|---|
| **Soil** | Soil Conservation Act 6 of 1969 | This act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources | - The mining activities will leave earthed soils hence rehabilitation must be done during the decommissioning phase.<br>- Ensure safe operations so as to avoid oil, grease and fuel spillages which can cause soil contamination |
| **Water** | Water Act 54 of 1956 | – Prohibits the pollution of underground and surface water bodies. | – Fuel and oil leakages from operating machinery and vehicles might be experienced hence this can result in environmental contamination with possibilities of negatively affecting groundwater if the quantities and frequency are high<br>– If drilling activities go below the level of the water table, they might be possibilities of pollution. Hence the pollution of water resources should be avoided during the operation phase |
| **Health and Safety** | Labour Act (No 11 of 2007) | – This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices. | – The Proponent will be obliged to create a safe working environment for the employees.<br>– To follow legal labour requirements on remuneration |
| | Public Health and Environmental Act, 2015 | – The act mainly emphasis on proper management of the environment, to prevent negative health impacts.<br>– The act promotes proper waste management. | – Proper waste management should be promoted to prevent nuisance, which can consequently affect public health.<br>– Recycling, reuse and reduce must be practised at all times.<br>– Ensure public safety from noise and dust |
| | Heritage Act | – The Heritage Act of 2004 makes provision for the developer to identify and assess any archaeological and historical sites of significance. The | – In an event that the Proponent comes across any archaeological or historical sites of significance, they should report immediately to the Monuments Council |

| | | | |
|---|---|---|---|
| | | existence of any such sites should be reported to the Monuments Council as soon as possible. The Council may serve notice that prohibits any activities as prescribed within a specified distance of an identified heritage/archaeology site. | |
| | Regional Council Act, 1992 (Act No. 22 f 1992) | – The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development. The main objective of this Act is to initiate, supervise, manage and evaluate development at regional level. | - To observe the regional by laws |

**N.B:** The Proponent shall be required to comply with the legislations. Where there is need to engage private consultants to facilitate compliance, the Proponent is encouraged to consult qualified personnel. The Environmental consultant is supposed to conduct legal compliance audits and produce bi-annual reports, which will be required during renewal of environmental clearance certificate. The Proponent is also required to seek permits or consents were necessary. Some of the permits might include;

**Table 2: Some of the key permits for small-scale mining in Namibia**

| **Permit / Licence** | **Issuing Authority** | **Purpose** |
|---|---|---|
| Mining Claim (MC) | Ministry of Mines and Energy | Legal right to mine |
| Environmental Clearance Certificate (ECC) | Ministry of Environment, Forestry and Tourism | Environmental approval |
| Explosives Permit | Namibian Police | Blasting and explosives |
| Water Abstraction Permit | Department of Water Affairs | Water use |
| Land Access Consent | Traditional Authority | Use of communal land |
| Heritage Clearance | National Heritage Council | Protection of cultural sites |
| Road / Transport Permit | Roads Authority | Ore transport |
| Labour Compliance | Ministry of Labour | Worker safety and employment |

# 4. ENVIRONMENTAL MANAGEMENT PLAN IMPLEMENTATION FRAMEWORK

## 4.1 ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN ADMINISTRATION AND TRAINING

This Environmental Management Plan (EMP) shall clearly state the roles and responsibilities of all stakeholders to ensure that the EMP is fully implemented. The Proponent shall appoint an overall responsible person (Environmental Control Officer) to ensure the successful implementation of the EMP. The Environmental Control Officer needs to have qualifications and knowledge in environmental management implementation.

## 4.2 ROLES AND RESPONSIBILITIES

**Proponent (Petrus Shikoyeni Angula -PKP):** has the overall responsibility for all financial and work force provisions, which will facilitate the implementation of this EMP. The Proponent is responsible for the appointment of other personnel responsible for the implementation of this EMP.

**Competent and Monitoring authority (The Department of Environmental Affairs: Ministry of Environment Forestry and Tourism):** Responsible for the review and approval of the EIA and EMP documents.

**Project Manager** - Required in carrying out the overall responsibility for the implementation of the EMP to ensure that all required resources and mechanisms for environmental management are in place. Report all environmental issues to HSEO.

**Health Safety and Environmental Site Officer** (HSEO) - responsible of all environmental issues (waste management) and safety of employees. The HSEO should record and report all incidents on site.

**Environmental Control Officer** (ECO) - required to take independent responsibility of the implementation of this EMP. ECO is contracted to conduct periodic monitoring of the sites, compilation of all reports to be submitted to MEFT: DEA for renewal of the environmental clearance certificate.

**Employees -** Required to follow requirements as directed by the project manager. Report any potential environmental issues to the project manager.

**Contractors** - all contractors (including subcontractors) and service providers are ultimately responsible for:

• Complying with the Environmental Management Plan specifications where applicable;

• Provide Environmental; Method Statements to the Project Manager with regards to how certain activities on-site will be conducted.

• Adhering to any environmental instructions issued by the Project Manager

- Arrange that all the contractor's employees receive training. Trainings have to be appropriate for the level of the tasks and functions undertaken.

The Environmental Method Statement referred to above will cover applicable details with regard to:

• Equipment to be used;

• Getting the equipment to and from site;

• How the equipment will be moved while on-site;

• How and where material will be stored;

• The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;

• Identified potential impacts of the activity and mitigation measures thereof;

- Compliance/non-compliance with the Environmental Specifications; and
- Any other information deemed necessary by the Project Manager.

# 5. ENVIRONMENTAL MANAGEMENT PLAN

The following tables form the core of this EMP for the small scale mining phase. The below information shown in the tables, should be used as a checklist on site.

## 5.1 MANAGEMENT OF NEGATIVE IMPACTS ASSOCIATED WITH CONSTRUCTION PHASE (SITE PREPARATION AND INFRASTRUCTURE INSTALLATION):

### 1. Impact on vegetation

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Impact on vegetation** | During site preparation, vegetation will be cleared to pave way for the proposed project. Areas which need to be worked on will be cleared and also areas where infrastructure will be installed. In addition, cutlines will also be created when necessary. It is essential to note that the area of study is within the Ozondundu Conservancy and the dominate tree type is Mopane. It will be definite that vegetation will be cleared to pave way for the development and the severity is expected to be moderate without mitigation and of slight impact with mitigation. | • Protected plant species should not be removed but preserved and the activities should fit into the environment without affecting the protected trees.<br>• Proponent shall be compelled to protect the natural resources around the area.<br>• Vegetation should be cleared on areas which need to be worked, massive and unnecessary clearing is discouraged.<br>• Maintain the stated boundaries, no activates shall be carried outside the demarcated boundaries<br>• Personnel shall not be allowed to cut trees for firewood | Construction phase (Site Preparation and Infrastructure Installation): | Proponent, Contractors, Project Manager, Environmental Control Officer |

**2. Impact on fauna**

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Impact on fauna** | The clearing of vegetation will consequently result in destruction of habitats for wildlife, birds, and insects within the area. In addition, the clearing might also result in reduction of biodiversity in the mining area. Animals within the area might also be disturbed by noise generated by human activity. This might make some species to relocate while others may disappear from the affected area. | • Limit vegetation removal only to areas required for mining.<br>• Establish buffer zones around sensitive habitats. | Construction phase (Site Preparation and Infrastructure Installation): | Proponent, Contractors, Project Manager |

### 3. Impact on soil

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Impact on soil** | During the site preparation, topsoil stripping and stockpiling will be done hence affecting the natural state of the environment within the study area. In addition, clearing of vegetation to pave the way for the development will also reduce the soil stability. | • Cover stockpiles to prevent erosion<br>• Avoid unnecessary vegetation clearing | Construction phase (Site Preparation and Infrastructure Installation): | Proponent, Project Manager, Environmental Control Officer |

## 5.2 MANAGEMENT OF NEGATIVE IMPACTS ASSOCIATED WITH OPERATION PHASE:

### 1. Impact on landscape

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Landscape** | Open-cast mining requires the removal of vegetation and topsoil to expose the ore body hence this will disturb the natural state of the sites. In addition, the drilling and blasting effect will cause alternation of existing landscape. During the small-scale mining there will be creation of mine pits, waste rock dumps, and haul roads that alter the landscape. | • Minimize land disturbance: Restrict clearing and excavation only to the required mining footprint.<br>• Topsoil stripping and storage: Remove and stockpile topsoil separately for later rehabilitation.<br>• Progressive rehabilitation: Rehabilitate mined-out areas while mining continues in other sections.<br>• Backfilling of pits: Use waste rock and overburden to fill excavated pits where feasible.<br>• Slope stabilization: Shape slopes to safe angles to prevent collapse and erosion.<br>• Maintain selective drilling | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

## 2. Air quality and Dust Generation

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Air quality and Dust Generation** | Dust is expected to be generated from the following activities, drilling, blasting, loading and movement of trucks and machinery. Emissions from trucks and operating machinery might also produce exhaust emissions which might affect the quality of air within the area of work. Dust and exhaust emissions generated might increase particulate matter in the air, reduce air quality which will affect employees and affect vegetation in cases of dust and exhaust emissions deposition. Employees working in the area are the ones who might be at risk hence they are expected to cover themselves with dust masks to avoid contracting diseases like pneumoconiosis. | • Soil watering when soil works are being executed and where dust is emitted<br>• People at site should be provided with dust masks<br>• Cover trucks transporting ore<br>• Regular monitoring and review to ensure safe operation<br>• Limit vehicle speed on haul roads<br>• Maintain mining equipment regularly to reduce emissions | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

### 3. Noise

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Noise** | Noise above the ambient levels of the area might be generated locally from the small-scale mining activities such as drilling, blasting, frequenting trucks and operating machinery such as excavators and loaders. Noise generated might affect animals within the area and employees working at the site hence posing a risk of ear damage to the employees. The normal levels of 55 decibels recommended by World Health Organization (WHO) might be surpassed during the operational phase. Drilling machines can produce noise of 95-100 decibels. | • A drilling interval should be established, used and adhered to and working hours should be limited to minimum of 8 hours per day<br>• Restrict blasting and noisy operations to daytime hours and blasting should be notified to employees before it takes place<br>• Noise should be addressed and mitigated at an early stage and employees should be equipped with ear protection equipment.<br>• Proper and timely maintenance of machineries, trucks and vehicles | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

## 4. Impact on Soil

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| Soil | Soil might also be partly affected by oil or fuel leakages from trucks and operating machines. | • Proper care should be taken so that there is no spill that would cause soil contamination<br>• If any hazardous waste is produced it should be properly handled and sent for disposal to appropriate disposal areas<br>• Proper storage area with proper containment should be there at the site<br>• Proper and timely maintenance of machineries, trucks and vehicles | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

## 5. Impact on vibrations from blasting

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Impact on vibrations from blasting** | Explosives used during blasting generate ground vibrations and shock waves. To note, there are no nearby buildings near the sites hence if this is to happen it will affect the structures on the study area. In addition, blasting activities will disturb wildlife within the area. | • Develop and follow a controlled blasting plan.<br>• Use small and controlled explosive charges.<br>• Conduct blasting only at designated times and notify employees beforehand.<br>• Maintain safe blast distances. | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

## 6. Impact on surface and groundwater sources

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Impact on surface and groundwater sources** | Fuel is likely to be kept on site in cases that the operating machinery and trucks run out of fuel. The nearest area to obtain fuel is Opuwo but the distance is far for the machinery to be refuelled every day. There is risk of spillage of hydrocarbons from trucks, vehicles and operating machines which may result in environmental contamination. Chemical residues from explosives and waste rock piles exposed to rainwater may also cause contamination if they find their way to the water bodies. The nearest ephemeral river to the mining claims is Aap River which is approximately 15km hence posing minimum harm to surface water bodies. The probability of groundwater sources being affected is low given that the operations will be small scale. Furthermore, it will also be unlikely that the water table will be affected, | • Implement a maintenance programme to ensure all vehicles, machinery and equipment remain in proper working condition and maintenance should be conducted in designated areas only, preferably off-site.<br>• Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by a hazardous waste handler.<br>• Store fuels and oils in bunded areas to prevent leak<br>• In case of any spills, immediately cleanup spills using absorbent materials<br>• There should be a monitoring programme for water use, water volumes used on site should be recorded<br>• Registered boreholes have recorded yields, as such if projected water requirements for the mining operations exceeds this yield or approaches the threshold of these boreholes then alternative water supply arrangements should be made. | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

| | | | | |
|---|---|---|---|---|
| | the excavations will not reach the water table levels. | • Operations should not reach the water table. In an event that this occurs, an updated EMP to cater for mining below the water table should be prepared | | |

## 7. Generation of waste

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Generation of waste** | Waste will be generated from unearthed waste rocks. During open-cast mining, amounts of waste material are produced and this waste will be disposed at the waste dump, an area which will be designated for that purpose at the site. In addition, waste will also be produced from oils, fuel, food leftovers, papers and plastics. | • Contaminated wastes in the form of soil, litter and other material must be disposed off at an appropriate disposal site.<br>• Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts<br>• Frequent collection of waste at the site by service providers<br>• Placement of refuse bins at the sites<br>• Placement of portable toilet on the sites for employees<br>• Identify designated waste rock disposal areas.<br>• Use waste rock for backfilling mined pits where possible | Operation Phase | Proponent, Contractors, Project Manager and appointed Environmental Control Officer |

## 8. Traffic and Transportation Impacts

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Traffic and Transportation Impacts** | Transportation of ore and materials will increase traffic in the area. Mined ore will be transported to a central processing area where the crushing process will take place. The crushers are located around the area of Otjapijapi and Otwani and in this instance, the Otjapijapi crusher will be nearer. Further transportation of the ore will happen until it reaches its' market. This movement of trucks will have a possibility of damaging the roads, increasing dust along transport routes, risk of road accidents and increase of noise and disturbance to settlements along the routes which will be used. | • Control vehicle speed limits.<br>• Schedule transportation of the ore<br>• Install road signage and warning systems. | Operation Phase | Proponent, Contractors, Project Manager |

## 5.3 MANAGEMENT OF SOCIO-ECONOMIC IMPACTS ASSOCIATED WITH OPERATION PHASE

### 1. Occupational Health and Safety

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **OHS** | The use of explosives for blasting might presents risks to employees such as accidental explosions due to improper handling of explosives, injuries from flying rock fragments during blasting, exposure to dust and gases, risk of pit wall collapse or rock falls and equipment accidents involving trucks and excavators. In addition, occupational stress and noise can also affect employees. Work pressure on employees can cause stress hence resulting into accidents. | • Provide training on safe drilling and blasting practices including blasting notifications, warning and evacuations prior to blasting<br>• Use licensed explosives handlers.<br>• Maintain machinery regularly.<br>• Provide first aid and emergency response plans.<br>• Conduct Hazard identification and risk assessments<br>• Comply with all Health and Safety standards specified in the Labor Act.<br>• Provide all staff on site with protective equipment (helmets, gloves, dust masks, work suits, earplugs, goggles and safety shoes where applicable).<br>• Safety Posters and slogans should be exhibited at conspicuous places.<br>• Provisions of immediate accident/incident reporting and investigation. | Operation Phase | Proponent, Contractors, Project Manager, (HSEO) |

## 2. Increase of the number of people in the area

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Increase of the number of people in the area** | There shall be people who will come to work at the sites. The proponent highlighted that an average of 15 people will be working on each mining claiming. The proponent will hire local people where necessary and where expertise is required the people will be sourced outside the community. The impact of population influx is expected to remain of low environmental significance given that the numbers which will be employed are not too high and some of these people will be employed as locals. | • Local employment should be a priority so as to reduce the number of outsiders entering the study area | Operation Phase | Proponent, Project Manager |

### 3. Heritage impact

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Heritage impact** | At the sites, there are no known heritage areas or artefacts deemed to be impacted by the activities. An archaeological study for the area was done during the exploration phase and nothing of significance was found. However, there might be unknown archaeological remains within the mining claims which might later be found during the excavations. If the Proponent come across archaeological features or objects that possess cultural values (e.g. Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves etc.), the area should be barricaded off and the relevant authorities should be contacted immediately. | • The Proponent should consult the headman of the area before conducting any work.<br>• All works are to be immediately ceased should an archaeological or heritage resource be discovered.<br>• The National Heritage Council of Namibia (NHCN) should advise with regards to the removal, packaging and transfer of the potential resource. | Operation Phase | Proponent, Project Manager, Contractors |

## 4. Risk and spread of HIV/AIDS

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **HIV/AIDS** | The fact that people will be coming from different locations and meeting at one place can result in anti-social behaviours hence the spread of HIV/AIDS | • Employer should allocate time for employees to visit their families.<br>• Free distribution of condoms | Operation Phase | Proponent, Project Manager, Contractors, (HSEO) |

## 5. Cumulative impacts

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Cumulative impacts** | The landscape will be altered by activities associated with site preparation and mineral ore extraction by open cast. This alteration will have possibilities of affecting the habitancy for some animals which can further affect the food web. | • Removed rocks and soil should be replaced back and levelling of the area done so as to try to restore the area to its natural state.<br>• Implement community grievance mechanisms.<br>• Minimize land disturbance: Restrict clearing and excavation only to the required mining footprint.<br>• Topsoil stripping and storage: Remove and stockpile topsoil separately for later rehabilitation.<br>• Progressive rehabilitation: Rehabilitate mined-out areas while mining continues in other sections.<br>• Backfilling of pits: Use waste rock and overburden to fill excavated pits where feasible.<br>• Slope stabilization: Shape slopes to safe angles to prevent collapse and erosion.<br>• Maintain selective drilling | Operation Phase | Proponent |

## 5.4 POSITIVE IMPACTS ASSOCIATED WITH THE PROJECT

### 1. Local empowerment

| Impacts | Description | Enhancement Required | Project Phase | Responsibility |
|---|---|---|---|---|
| **Local empowerment** | The owner of the mining claims is a Namibian hence if this project is implemented a local will be empowered. | • Continue to promote locals | Operation Phase | Proponent |

### 2. Employment creation

| Impacts | Description | Enhancement Required | Project Phase | Responsibility |
|---|---|---|---|---|
| **Employment creation** | It is definite that jobs will be created. The type of jobs will range from skilled, semi-skilled and unskilled and locals will definitely be recruited | • Employ locals in all casual labour and ensure gender equality.<br>• Equity, transparency, to be put into account when hiring and recruiting | Operation Phase | Proponent |

### 3. Community development

| Impacts | Description | Enhancement Required | Project Phase | Responsibility |
|---|---|---|---|---|
| **Community development** | The proponent will assist the community when they can. During the public consultation, the locals highlighted the need of the proponent to assist in the development of the community. | • The whole community must benefit in future | Operation | Proponent |

### 4. Generation of Revenue

| Impacts | Description | Enhancement Required | Project Phase | Responsibility |
|---|---|---|---|---|
| **Generation of Revenue** | Proponent, contractors and subcontractors will pay tax hence generating revenue. | • To pay taxes as stipulated by the law of Namibia. | Operation Phase | Proponent, appointed contractors |

## 5.5 MANAGEMENT OF IMPACTS AT DECOMMISSIONING PHASE

| Impacts | Description | Mitigation Measures | Project Phase | Responsibility |
|---|---|---|---|---|
| **Post-small scale mining stage**<br><br>**(Landscape)** | Given that this will be small scale mining, the damage to the environment is expected to be minimum. However, pits created during the operation phase need to be rehabilitated. | • Develop and implement a rehabilitation plan.<br>• Backfill open pits where feasible.<br>• Use the stockpiled soil to cover the ground so as to try to return the area to its natural state.<br>• Fence off dangerous areas if pits cannot be filled.<br>• Restore vegetation using indigenous plants.<br>• Monitor rehabilitation success after closure. | Decommissioning Phase | Proponent |

# 6. ENVIRONMENTAL MONITORING

A monitoring programme will be in place to ensure conformance with the EMP. The Environmental Control Officer will ensure compliance with the EMP, and carry out monitoring activities. The Environmental Control Officer must have the appropriate experience and qualifications to undertake the necessary tasks. The Environmental Control Officer will report to the Proponent should any non-compliance be evident or corrective action necessary. The suggested monitoring details are outlined in table 3 below.

**Table 3:** Monitoring of identified impacts

| **IMPACT** | **RECEPTORS** | **TYPE OF MONITORING** | **PERIOD/TIME** |
|---|---|---|---|
| Alternation of existing landscape | Environment | • Inspection | Period of operation phase |
| Dust | Employees | • Regular site inspections | Daily |
| Impact on fauna | Environment | • Inspection | Throughout the project |
| Surface & groundwater Pollution | Environment | • Tests on the nearby surface water body and boreholes | Once in a year |
| Noise | Employees | • Noise monitoring | Daily |
| Vegetation loss | Environment | • Inspection of protected plant species and incorporate them into the development | • Period of site preparation |
| Heritage | Land | • Inspection | • Throughout the project |
| O.H. S | Employees | • Site inspection<br>• Conducting Hazard and Risk Assessments<br>• Health and safety incident monitoring | • Daily |
| Generation of waste (solid) | Land | • Site inspection on housekeeping<br>• Regular collection of waste | • Daily<br>• Monthly |
| HIV/AIDS | Employees | • Free testing | • Annually |

# 7. CONCLUSIONS

It is the applicant's responsibility to ensure that this EMP is made binding on the contractor by including the EMP in the contract documentation. The contractors should thoroughly familiarise themselves with the requirements of the EMP.

The above Environmental Management Plan, if properly implemented, will help to minimise adverse impacts on the environment. Where impacts occur, immediate action must be taken to reduce the escalation of effects associated with these impacts.

The Environmental Management Plan should be used as an on-site reference document during the proposed development and auditing should take place in order to determine compliance with the EMP for the proposed sites. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken.