

REPORT:ENVIRONMENTAL IMPACT ASSESMENT SCOPING REPORT AND ENVIROMENTAL MANAGEMENT PLAN

Environmental
Management Plan



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(Proponent)

New Horizon Investment Group



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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
CPC	Cuvepalm Consulting cc
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Plan Report
GHGs	Greenhouse Gasses
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MAWF	Ministry of Agriculture Water and Forestry
MEFT: DEA	Ministry of Environment Forestry and Tourism's Directorate of Environmental Affairs
NHC	National Heritage Council
NHIG	New horizon Investment Group
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development

The **'Proponent'** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e. NHIG/Global Smelters.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

i. Purpose of this Environmental Management Plan (EMP)

This document has been compiled in line with Regulation 8 of the Environmental Management Act (EMA) No. 7 of 2007 and its Environmental Assessment Regulations (2012) that requires that a draft Environmental Management Plan (EMP) be included as part of the Scoping Assessment process. A 'management plan' is defined as:

"...a plan that describes how activities that may have significant environments effects on the environment are to be mitigated, controlled and monitored."

An EMP is one of the most important outputs of the Environmental Assessment (EA) process as it synthesises all of the proposed mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the EIA Process and the required environmental management on the ground during project implementation and operation.

It is important to note that an EMP is a legally binding document and a person who contravenes the provisions of this EMP may face imprisonment and/or a fine. This EMP is a living document and should be amended to adapt to address project changes and/or environmental conditions and feedback from compliance monitoring.

The purpose of this document is therefore to guide environmental management throughout the different phases of the proposed project, namely; site preparation or construction phase, operational and decommissioning phases. This EMP will have to be effectively implemented by the Proponent, Project Manager, their engineers and contractors, to ensure that adverse environmental impacts are properly managed. The management of these impacts will be done by effective implementation of the management measures and subsequent implementation monitoring.

NB: This document has been developed in conjunction with the project environmental scoping report (ESR). Therefore, it is highly recommended that this EMP is studied or used together with these two documents, but especially the project ESR for further information that may be required to fully understand the EMP, if needed.

1. CHAPTER ONE: INTRODUCTION AND BACKGROUND

1.1. Project Background and Location

The proponent, New Horizon Investment Group (NHIG) is an indigenous Namibian enterprise that is involved in the mining sector since 2010. The company has identified potential copper deposits in Omaheke, Namibia. In this respect NHIG is in the process of planning exploration activities and subsequent copper mining activities. However, it is standard procedure and pre-requisite under the Environmental Management Act No.7 of 2007 and the Environmental Impact Assessment Regulations (GN 30 in GG 4878 of 6 February 2012) that the proponent (in this case NHIG) to first undertake an Environmental Impact Assessment, which is submitted to the Ministry of Mines And Energy (MME) and the Ministry of environment, Forestry and Tourism: Department of environmental Affairs (MEFT: DEA) for review.

Furthermore, as per the requirements of the Environmental Management Act No. 7 of 2007, Cuvepalm Consulting cc (CPC) were appointed by NHIG on 18 February 2021 to conduct an Environmental and Social Impact Assessment (ESIA) and develop an Environmental & Social Management Plan (ESMP) for the proposed project.

This has been followed by an application for Environmental Clearance Certificate (ECC) to the Ministry of Environment and Tourism (MET): Directorate of Environmental Affairs (DEA).

Subsequently, this document forms part of the application to be made to the DEA's office for an Environmental Clearance certificate for the proposed construction and operation of a copper smelting plant, in accordance with the guidelines and statutes of the Environmental Management Act No.7 of 2007 and the environmental impacts assessment regulations (GN 30 in GG 4878 of 6 February 2012).

1.2. Project Location

The two EPLS (7122 and 7072) are bordering each other and located about 40km and 70km north and northwest of Witvlei Village and Gobabis Town.

1.3. 1. PROJECT ACTIVITIES

Explorations comprise various phases. For this EIA, the phase-based activities were categorized to enable impact assessment and analysis. The following project phases and their respective activities are as follows:

Site Preparation/ Construction phase:

Access agreements will guide the engagement between landowners, proponent and exploration team leaders. The exploration team will undertake initial site visit to identify sites for the establishment of field camps in conjunction with landowners. Site preparation activities will begin once surface drainage and ground water conditions are understood by proponent and contractors. Exploration will only commence after ecological sensitive areas are known.

Small land parcels will be cleared for the establishment of base or field camps and storage of exploration equipment. Proponent shall ensure that areas identified are those that less sensitive to disturbance.

Creation of access routes and haul tracks: Apart from the existing farm roads network leading to target areas, additional tracks (extensions from farm roads) may be created. Where deemed necessary, graveling, and compacting of the track's surfaces may be considered to allow less track maintenance. No roads of bitumen standard exist in the EPL area. No permanent structures will be built for exploration works. Additional roadways may be considered for the purposes of accessing target sites.

Fencing: Where deemed feasible, fences will be erected around field camps and target areas.

Stripping Activities: Stripping will involve the removal of overburden material overlaying the ore deposits. The overburden material will comprise of topsoil and rock material. A bulldozer will be used to move overburden material.

Bulk sampling/Trenching (Mechanical Excavation): Bulk sampling signifies an advance level of exploration. Sampling will serve to validate prior exploration results of the mineral deposits. The appropriateness of the bulk sample will be related to the deposit morphology. The final objective is to obtain quantitative information required for evaluating the deposit as part of NHIG research and development programme and ultimately inform decision that may lead to a profitable mining operation.

Trenches will be excavated mechanically to up to a depth of 5 m maximum exposing the ore deposit. Trenches will be 50m long and 5m wide. Backhoe excavators will be used for excavations. A primary crusher unit and an ore screen will be installed within the project area. Primary crushed ore will be crushed further to obtain a product of -150 mm and + 50mm to liberate the high-grade ore. The latter will be required for performing processing trials and metallurgical testing programme. Front end Loaders will be used to load the ore onto haulage trucks. Waste rock will be stockpiled adjacent to trenches.

Site Rehabilitation /Reclamation: Dug out trenches will be back filled with waste rock (gangue). Stockpiled top soil will be returned to the backfilled areas i.e to overlay the backfill. Sites will also be re-vegetated and returned to a pre-exploration condition. It is projected that rehabilitation will be done concurrently with exploration.

1.4. Project Phases Covered in the EMP

The following phases are addressed in this EMP:

- **Site Preparation/ Construction phase:** This is the period prior to the operational phase, during which preliminary legislative review is conducted, technical designs and administrative arrangements are carried out.

Site preparation works will be carried out to establish staging sites or field camp and creation of secondary access routes and additional haulage tracks. For the purpose of this report site preparation and construction are used interchangeably and shall carry equal meaning.

- **Operational (exploration phase:** The phase will include bulk-sampling (trenching, trial mining, stockpiling, hauling) and backfilling.
- **Decommissioning phase:** The phase during which the NHIG may decide to cease exploration activities i.e. closure of the operations and rehabilitation.

1.5. Environmental Assessment Practitioner (EAP)

The proposed project by NHIG triggered the need for an Environmental Impact Assessment (EIA), Environmental Management Plan (EMP) and application for an Environmental Clearance Certificate (ECC) as the project falls under the listed activities, highlighted as follows:

- **-Section 27 (2)**
 - (a) land use and transformation;
 - (c) **resource removal, including natural living resources;**
 - (e) agricultural processes;
- **Regulation 3.1:** Exploration requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act), 1992.
- Regulation 3.3: Resource extraction, manipulation, conservation and related activities.
- **Regulation 9.2** Any process or activity which requires a permit, license or other form of authorization, or the modification of or changes to existing facilities for any process or activity which requires an amendment of an existing permit, license or authorization or which requires a new permit, license or authorization in terms of a law governing the generation or release of emissions, pollution, effluent or waste.

In order to comply with the EMA and its 2012 EIA Regulations, the NHIG appointed Cuvepalm Consulting cc (hereinafter referred to as the *Environmental Consultant*) to undertake the required EA process and submit the Environmental Clearance Certificate (ECC) application to the Competent Authority on their behalf. Different components of the proposed project activities are subjected to different legal requirements. The legal implications or applicability to these activities and details, in terms of permitting and licensing are presented under the following chapter.

2. CHAPTER TWO: ENVIRONMENTAL LEGAL REQUIREMENT (PERMITS AND LICENSES)

This chapter presents the information and detailed information on the legal obligations that governs certain project activities that will require permitting and/or licensing from different applicable regulatory authorities. **The detailed list of all legislations, policies and guidelines are presented in the environmental scoping document (report).**

Table 1: Legislation and Permitting

LEGISLATION/POLICY	RELEVANT PROVISION/ PROJECT APPLICABILITY	REQUIRED PERMIT/CLEARANCE OR LICENSE
<p>Environmental Management Act No. 07 of 2007</p> <p>Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)</p>	<p>Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27).</p> <p>Detailed principles which are to guide all EAs. The EMA and its Regulations should inform and guide this EA process.</p>	<p>- Should the ECC be issued to the Proponent, it should be renewed every 3 years.</p> <p>- Should there be changes to the exploration methods, proposed amendments should be communicated to MEFT(DEA) for approval.</p> <p>Bi-Annual reports should be informed by Monthly compliance inspections and submitted for review to MEFT</p> <p>Contact details at the Department of Environmental Affairs (DEA):</p> <p>Tel.: +264 61 284 2701 OR Environmental Assessment Unit Mr. Damian Nchindo, Tel: +264 61 284 2717, Email: damian.nchindo@met.gov.na</p>
<p>The Water Act 54 of 1956</p> <p>Water Resources Management Act No. 11 of 2013</p>	<p>The project will potentially use significant amount of water. The activities directly affect water conservation, management and use therefore, requires the implementation of water conservation techniques and obtaining relevant operational permits. The protection (both quality and quantity/abstraction) of water resources should be a priority throughout the project life cycle.</p>	<p>Given the fact that the project may warrant a high water demand and new boreholes , a water abstraction and use permit may be needed. Consult the Department of Water Affairs & Forestry (DWA): Directorate of Water Resources Management: Water Policy and Water Law Administration</p> <p>Contact: Mr. F. Witbooi (Deputy Director) Tel: +264 208 7158</p>

LEGISLATION/POLICY	RELEVANT PROVISION/ PROJECT APPLICABILITY	REQUIRED PERMIT/CLEARANCE OR LICENSE
		<p>Email: Franciskus.Witbooi@mawf.gov.na</p> <p>It is likely that effluent/wastewater will be produced on site, therefore a discharge permit should be applied for from the Department of Water Affairs & Forestry (Water Environment Division at the Ministry of Agriculture and Forestry)</p> <p>Contact: Ms. Elise Mbandeka Tel: +264 61 208 7167 Email: Elise.Mbandeka@mawf.gov.na</p>
<p>Road Traffic and Transport Act, No. 22 of 1999</p>	<p>The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.</p>	<p>Should the Proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required from the Ministry of Works and Transport's Roads Authority.</p> <p>Contact: Mr. Eugene de Paauw (Specialist Road Legislation, Advice & Compliance) Tel: +264 61 284 7027 Email: dePaauwe@ra.org.na</p>
<p>Forestry Act no 12 of 2001</p>	<p>Permit is required for the removal of protected plants</p>	<p>Forestry Permit:</p> <p>Contact: Ms Emilly Mathias(Forest Technician)</p> <p>Gobabis Forestry Office Tel: 062- 562872 Email: emiliamandy@gmail.com</p>

LEGISLATION/POLICY	RELEVANT PROVISION/ PROJECT APPLICABILITY	REQUIRED PERMIT/CLEARANCE OR LICENSE
National Heritage Act (No. 27 of 2004)	Discovered heritage resources should be reported to the National Heritage Council.	<p>Contact: Dr A. M. Nankela (Chief Archaeologist & Rock Art Specialist)</p> <p>National Heritage Council: Archaeology Unit</p> <p>Tel: +264 61 301 903, Email: archeology@nhc-nam.org</p>
Stock theft amendment Act No. 19 of 2004	Prescribes minimum jail terms as high as 30 years for stealing livestock	<p>Livestock Crime Reporting and Ownership Verification:</p> <p><u>Namibian Police</u></p> <p>(Witvlei Police Station : Tel+264 570 002)</p> <p><u>Gobabis State Veterinary :</u></p> <p>Dr Anna Homateni (Email: annahomateni@gmail.com)</p> <p>Mobile: 0811431154</p>

3. CHAPTER THREE: EMP ROLES AND RESPONSIBILITIES

3.1. Overview

The chapter gives a presentation of the roles of different parties involved in the project cycle (from planning to operations and their respective responsibilities towards the implementation of the EMP.

This EMP informs all relevant parties listed below and other staff employed at the site as to their duties in the fulfilment of the legal requirements relating to exploration. This is done with particular reference to the prevention and mitigation of anticipated potential negative environmental impacts. All parties should note that obligations imposed by the EMP are legally binding in terms of the Environmental Clearance granted by the relevant environmental permitting authority, in order to:

- Ensure compliance with regulatory authority stipulations and guidelines
- Verify environmental performance through information on impacts as they occur;
- Identify a range of mitigation measures which could reduce and mitigate the potential impacts to minimal or insignificant levels;
- Detail specific actions deemed necessary to assist in mitigating the environmental impact of the project;
- Provide feedback for continual improvement in environmental performance
- Create management structures that addresses the concerns and complaints of I&APs with regards to the development;
- Establish a method of monitoring and auditing environmental management practices during all phases of the activity.

3.2. Roles and Responsibilities

3.2.1. Proponent (NHIG)

The Proponent is ultimately responsible for the implementation of the EMP. Alternatively, if the Proponent does not manage all aspects of site preparation/construction, operational and decommissioning phases referred to in this EMP, they should assign this responsibility to a suitably qualified independent third party or subcontractor referred to in this plan as the Proponent's Representative (PR).

The delegated responsibility for the effective implementation of this EMP will rest on the following key individual which may be fulfilled by the same person referred to as the Proponent Representative (PR). The PR's responsibilities include:

- Managing the implementation of this EMP and updating and maintaining it when necessary.
- Management and monitoring of individuals and/or equipment on-site in terms of compliance with this EMP.
- Issuing fines for contravening EMP provisions.
- Alternatively, the Proponent may delegate an external ECO to ensure EMP compliance throughout the project life cycle.

3.2.2. Environmental Control Officer (ECO)

The Proponent should assign the responsibility of overseeing the implementation of the whole EMP on the ground from the construction phase to decommissioning phase, a designated member of staff or external qualified and experienced person, referred to in this EMP as the Environmental Control Officer (ECO)/ Safety, Health and Environmental (SHE) Officer. The ECO will have the following responsibilities:

- Ensures that the provisions of the EMP as well as the environmental authorization are complied with during the construction and operational phases. The ECO must be fully conversant with the Environmental Impact Assessment, Environmental Management Plan and compliance monitoring.
- Issuing of instructions to the contractor where environmental considerations call for action to be taken.
- Submit monthly written reports to project manager, ensuring that activities onsite comply with all relevant environmental legislation, verifying that adverse environmental impacts are kept to a minimum.
- Facilitation of communication between the Proponent, PR and Interested and Affected Parties (I&APs) with regard to this EMP.
- Conducting regular EMP compliance monitoring and enforcement.
- Advising the PR on the removal of person(s) and/or equipment not complying with the provisions of this EMP.
- Making recommendations to the PR with respect to the issuing of fines for contraventions of the EMP.
- Undertaking an annual review of the EMP and recommending additions and/or changes to this document.

3.2.3. Project Representative (PR)

The project representative is the project manager or mining engineer (appointed by NHIG), Construction Contractor(s) (to be appointed). As appropriate for the EMP requirements the three will:

- Ensure the relevant commitments contained in the EMP Action Plans are adhered to;
- Compile relevant procedures and method statements for approval by the applicable phase site manager prior to initiation of activities;
- Ensure relevant staff are trained in procedures; and
- Maintain records of all relevant environmental documentation.
- Ensure that an emergency response plan is developed and implemented.
- Identifying and appointing of appropriately qualified specialists (were necessary) to undertake the programs in a timeous manner and to acceptable standards.

3.2.4. Specialists/EAP

Specialized skills that may be required on an ad-hoc basis or in terms of environmental support services and independent compliance monitoring and auditing. The proponent will need to contract or appoint suitable/relevant professionals, as and when required. These specialists include:

- Environmental Auditor
- Occupational Hygienist,
- Geoscientist

Declaration of Commitment and Legal Compliance

Exploration activities will potentially result in environmental impacts as identified in the Environmental Assessment Report. This Environmental Management Plan, ensures that all the identified impacts are minimised and or avoided, as such, it becomes the sole responsibility of New Horizon Investment group to comply with the provisions of the EMP set herewith. The declaration of Commitment for the implementation of this EMP is as follows:

- New Horizon Investments Group hereby declares its full commitment to the full implementation of this EMP and to ensure that its management components are fully abided to.
- New horizon investment Group also commits to the appointment of an Environmental Control Officer (ECO) to ensure that compliance is sufficiently dealt with. The ECO shall conduct EMP compliance monitoring.
- NHIG commits to peruse the services of an independent EAP or environmental specialist to conduct quarterly monitoring audits to detect any unpredicted ecological impacts arising from the proposed development and monitor the effectiveness of the mitigation measures and recommend action plans in response to unpredicted impacts, and/or failed mitigation.

Signed:

Mr. Berend vd Berg

New Horizon Investment Group

4. CHAPTER FOUR:ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

4.1. Identified Potential Environmental Impacts

The following potential negative impact were identified and the mitigation measures or management action plans covered under this chapter are aimed at addressing these impacts. The impacts to be managed are as follows:

- Potential of water and soil contamination
- Waste generation and management
- Dust generation
- Noise
- Health and safety
- Vehicular traffic safety
- Visual (during operations) and archaeological impact
- Social nuisance: Influx of people into the area

4.2. Environmental and Social Management Actions (Measures)

The aim of the management actions of the EMP is to avoid potential negative impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts. The management action measures are clearly set out with the responsible implementation parties assigned to these as well as the timeframes for each action. This is done to ensure that the EMP implementation responsibilities are clearly given and each implementation party involved in the project is aware of their respective obligations from the project onset and remain accountable.

Table 2: Construction (Site Preparation) Phase Management Action Plans

Environmental Aspect	Impact	Management Actions	Responsible person(s) / Implementation responsibility	When?
EMP training	Lack of EMP awareness and the implications thereof	<ul style="list-style-type: none"> Employees appointed for construction work on respective infrastructure must ensure that all personnel are aware of necessary health, safety and environmental considerations applicable to their respective work areas. 	Proponent: ECO	Construction
Water	Water Use	<ul style="list-style-type: none"> A Water abstraction and use permit should be applied for from the DWA at MAWF 	Proponent(Project Manager and ECO)	Operational phase
	Water/ Effluent discharge	<ul style="list-style-type: none"> An effluent/wastewater permit should be applied for and obtained from the Department Water Affairs and Forestry (Water Environment Division). 		
	Water pollution control	<ul style="list-style-type: none"> A Storm water Management Plan should be designed and implemented on site. The plan must also include management mitigation measures for water pollution, drainage waste water management and the management of surface erosion e.g. by considering the applicability of contouring, etc. The storm water drainage network for working sites The project layout must be planned to ensure that a buffer zone of 50 meters is maintained and that no development activities occur within 100 meters of watercourses. 	Project Manager	Construction

Environmental Aspect	Impact	Management Actions	Responsible person(s) / Implementation responsibility	When?
Vegetation	Site clearing	<ul style="list-style-type: none"> • Should the Proponent need to remove certain protected tree species on and/or around the site, a relevant permit should be applied for and obtained from the Directorate of Forestry. • The removal of large trees with bird nesting sites should be avoided 	Proponent: ECO	All phases
Labour recruitment	Local employment	<ul style="list-style-type: none"> • Priority for casual work to be done during site preparation and operational phases should be given to locals • If they have the required skills to undertake the work in both phases, preference should be given to those locals. • Employment of out-of-area people should only be considered if the local community does not have the required skills or they are less in number to take up the work. • Employment of women, marginalised people and people with disability in the area should be encouraged. • Equal opportunities should be provided for both men and women. 	Contractor	Construction
Community Liaison	Tension remediation	<ul style="list-style-type: none"> • A convenient construction and exploration work/schedule should be prepared and be shared with the area, so that they can inform the local communities of when to expect the construction works in the area, given frequent heavy vehicles and possibility of new people in the area. 	Project Manager & Contractors	All phases

Environmental Aspect	Impact	Management Actions	Responsible person(s) / Implementation responsibility	When?
		<ul style="list-style-type: none"> Construction signs containing expected duration of construction should be designed and prepared for the site. 		
Roads	Vehicular traffic safety	<ul style="list-style-type: none"> If required by Roads Authority, secondary road access should be applied for and obtained. Speed limit and ‘no entry’ should be posted on segments of the haulage route or off ramps leading into exploration area or private property. 	Proponent	Construction, Operational phase
Aesthetics	Visual	<ul style="list-style-type: none"> The exploration site should be progressively restored 	Proponent(Project Manager)	Operation

Table 3: Operational Phase - Management Action Plans

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Monitoring	EMP non-compliance	<ul style="list-style-type: none"> The ECO should monitor the implementation of this EMP. The ECO should spontaneous inspections and scheduled inspections throughout the construction period on a Fortnight basis (2 times a month). An EMP non-compliance penalty system should be implemented on site. 	Proponent: ECO	All phases

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Ecological sensitive areas	Land degradation	<ul style="list-style-type: none"> • Work areas should be pre- inspected and approved by the Site Project Manager. Thereafter, all site staff should be clearly informed to avoid disturbance or maintain minimal disturbance. 	Site/Project Manager Proponent: ECO Construction Contractor	Construction
		<ul style="list-style-type: none"> • Ensure that there are firebreaks around field camp and working areas. At least 50 000 litres of water should be stored on site to combat potential veld fires. • Formulate and implement fire and emergency preparedness plan • The construction area must have all the necessary ablution facilities with chemical toilets at commencement of construction activities, ablution facilities shall be within 100m from workplaces but not closer than 100m (horizontal distance) from any natural water bodies or boreholes. There should be enough toilets available to accommodate the workforce. • The Contractor must supply waste collection bins where such is not available and all solid waste collected must be disposed of at the nearest approved landfill site. Under no circumstances may solid waste be burnt or buried onsite. 	Contractor	Construction

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Biodiversity	Maintenance of Biodiversity	<ul style="list-style-type: none"> • Employees should refrain from wild animals (big or small) that may be found within the EPLs • Employees should refrain from disturbing, killing or stealing of livestock or game animals. • Unless authorised by ECO, workers shall not remove any live or dead specimen of plants found on farms • Environmental awareness on the importance of biodiversity preservation should be raised to all project workers. 	Proponent: ECO All contractors and project workers	Ongoing
	Human Wildlife Conflict	<ul style="list-style-type: none"> • Prepare and implement human animal conflict remedial plan, • Ensure that workers are educated about dangers of wildlife(venomous snakes, predators) including skills on how to deal with wildlife encounters and potential conflict 	ECO	Ongoing
Soils	Physical disturbance	<ul style="list-style-type: none"> • Re-vegetation of disturbed surfaces must occur immediately after the construction activities are completed. • Prepare and Implement erosion prevention plan 	Proponent (Project Manager) & Contractor	Construction and Decommissioning

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> The stripping and stockpiling of the upper six inches of soil is a required for purpose of rehabilitation plan. 		
	Pollution	<ul style="list-style-type: none"> Spill control preventative measures should be put in place and documented in a spill management plan. No matter how small the spill is, it should be contained. Spill clean-up kits should be made available on site at all times. An emergency plan should be available for both major and minor spills on site in both project phases. Where hydrocarbons and other chemicals are used during the project’s phases on site, impermeable liners should be laid on such sites to capture possible spills, and prevent these substances from reaching the site soils. Drip trays should be made available for project vehicles, especially heavy trucks to contain possible fuel leaks and spills whilst applying lubricants. 	Proponent: ECO	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> In an event that any of the substances mentioned above, spill on the soil, the contaminated soil should be cleaned up immediately and dispose of in a designated hazardous waste bin and transported to the nearest approved landfill site. Open defaecation shall not be permitted. 		
Air Quality	Dust control	<ul style="list-style-type: none"> In extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain tracks and working sites presenting significant amounts of dust. Excavations and other clearing activities must only be conducted during agreed working times and permitting weather conditions to avoid drifting of sand and dust into neighbouring areas. Project vehicles and heavy machines should not be left idling when not in use, such that they emit air polluting gases. 	ECO	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Water Resources	Pollution prevention	<ul style="list-style-type: none"> • Potential contaminants such as hydrocarbons (diesel) should be contained on site and within permissible quantities. • All run off materials such as hydrocarbons, wastewater and other potential contaminants should be contained on site in designated containers and disposed of in accordance to appropriate disposal standards, so that they do not reach to water systems. • Drainage management plans (discharge points) should be kept on site to prevent potentially contaminated run-off from reaching water resources, especially during rainy seasons. • Contaminated wastewater must be managed by the Contractor to ensure existing water resources on the site are not contaminated. 	<p>Proponent: ECO</p> <p>Workers involved in this phases and subsequent phases</p> <p>Proponent: Planning/Construction Engineers</p>	Ongoing and as when required

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> Site staff must not be permitted to use any other open water body or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction related activities. 		
	<p>Water availability (impact on over abstraction of water resources)</p>	<ul style="list-style-type: none"> Although water is needed for many aspects of exploration, it should be used sparingly at all times. The requirements of the applicable water and wastewater legislations should be adhered and as per licence/permit stipulated conditions. The amount of water supplied from the existing boreholes should be used to inform the abstraction rate and water consumption practices during exploration As per the preceding point, the water management awareness will aid in ensuring that exploration does not affect existing users that rely on the same water supply source. 	<p>Project Manager ECO</p>	<p>Ongoing</p>

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Educate employees about dangers presented by locally occurring snakes, scorpions, predators • Due to dangers of predators, no movement of employees shall be permitted at night 		
	Health, safety and security of the locals	<ul style="list-style-type: none"> • A temporary stock proof fence should be erected around field camps. This is done to control access to the site, in such a way that the public do not access the site and interact with equipment and machinery on days when no work is done. • Were deemed feasible, a stock proof fence also known as the line of separation (LOS) should be constructed around work areas (trenches etc.). This will restrict entry of public , domestic animals, game animals , livestock • Field camp must be manned by security at all times in order to prevent theft or vandalism of equipment 	Contractor	

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Noise	Nuisance Control	<ul style="list-style-type: none"> • The construction times should be set such that, no work is carried out during the night or very early in the mornings. • Construction hours should be restricted to between 07h00 and 17h00 to avoid noise generated by construction equipment and the movement of vehicles before or after prescribed working hours. • When operating excavation machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure. • A noise zone shall be clearly demarcated and identified by notice indicating that relevant area is a noise zone • Where the movement of heavy vehicles is within 500 m of sensitive receptors (such as residential areas), the affected community need to be consulted well in advance to agree on a mutually acceptable working schedule • No worker in any part of the site should be exposed to a daily noise dose or peak noise level in excess of the standard laid down by the competent authority unless wearing an approved hearing protection device. 	Proponent: ECO	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> Heavy vehicle traffic must be routed away from noise sensitive areas, where possible. 		
Traffic	Public Safety	<ul style="list-style-type: none"> Drivers should be in possession of valid and appropriate driving licenses. Vehicle drivers should adhere to the road safety rules. Where site vehicles cross a footpath or turn onto a public highway, particular consideration needs to be given to safeguarding the public. This may involve discussions with the road planning authority, road traffic patrol or police authority. The proponent should ensure that the site access road is well upgraded and in a good condition to cater for vehicles travelling to and from exploration site Project vehicles should be in a road worthy condition and serviced regularly in order to avoid accidents as a result of mechanical faults. 	<p>Proponent: ECO</p> <p>Workers involved in this phases and operational phase</p> <p>Contractor</p>	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Vehicle operational checks should be conducted for not more than 5 to 10 minutes prior to each work shift. • Vehicle drivers should only make use of designated access roads and tracks as agreed with land owners • Vehicles drivers should not be allowed to operate vehicles while under the influence of alcohol. • Sufficient parking bays for all project vehicles and safe offloading and loading zones should be demarcated. • No heavy trucks or project related vehicles should be parked outside demarcated work areas. • Truck movements, frequency, times and routes should be carefully planned and scheduled – please refer to the next point. • In order to control traffic movement on site, deliveries from and to site should be carefully scheduled. This should optimally be during weekdays and between the hours of 08h00 and 17h00. 		

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Deliveries (Vehicles) should be carefully scheduled time so that they do not interfere with manoeuvrability of exploration equipment in the project area. • Vehicles shall not exceed a speed limit of 25 km per hour 		
Waste	Pollution Prevention(General waste)	<ul style="list-style-type: none"> • Exploration teams should be sensitized to dispose of waste in a responsible manner and not to litter. • After each daily works, no waste should be left scattered on site, but rather be disposed of in the temporary waste storage facilities or bins. • The sites should be equipped with separate waste bins for hazardous and general waste/domestic. • No waste may be buried or burned on site or anywhere else throughout the project lifecycle. • All domestic and general waste produced on a daily basis should be secured until its transported to a designated waste disposal sites on a bi-weekly basis during construction or site preparation phase and on a weekly basis during operations. 	ECO & Employees	Ongoing

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented. 		
	Human Health	<ul style="list-style-type: none"> • Sufficient portable chemical toilets should be provided on site for workers and appropriately emptied according to their manufacturer's operational standards. • Hazardous waste, including emptied chemical containers used should be safely stored on site where they cannot be reached and used by the unsuspecting employees • No waste should be improperly disposed of on site or its surroundings, i.e. unapproved waste sites. • As an emphasis on the preceding point, empty hazardous substance containers should not be disposed of anywhere on the project site or its surrounding, but instead they should be kept at a designated storing place on site until such time that they can be safely taken and disposed of at the nearest approved hazardous waste sites. • A waste management plan for handling onsite waste must be prepared and implemented. 	Proponent: ECO	

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
	Hazardous waste control	<ul style="list-style-type: none"> • All hazardous substances must be securely stored in an areas with an impermeable surface beneath them. • Hazardous material should be safely stored in accordance with permissible quantities allowed as per applicable laws. • Waste generated shall be timely disposed transported to the nearby approved landfill sites. • Hazardous waste shall be disposed at licenced hazardous waste disposal sites • Hazardous waste shall only be transported by licenced hazardous waste contractors • Empty hazardous substance containers should not be disposed of anywhere on the project site or it’s surrounding, but should be stored on site and safely taken to the nearest approved hazardous waste sites. 	Proponent: ECO	Ongoing and as required
Archaeological	Impact on unknown cultural or heritage sites/objects	<ul style="list-style-type: none"> • The Proponent should consider having a qualified and experienced archaeologist/ECO on standby. This measure will be to assist on the possible of uncovering of sub-surface graves or other cultural/heritage objects during site preparation (earthworks) and advice the Proponent accordingly. 	Proponent: ECO	As and when required

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> Any object or artefacts of archaeological significance on the site should not be disturbed, but shall be reported to the project Environmental officer or National Heritage Council offices for further instructions and actions. Workers should be educated to not destroy or throw away any artefact. Report (to the environmental officer) any unknown object found/discovered around water points approximate to exploration site. Some close to water points may signify early human settlement. 		
Population	Demographic change	<ul style="list-style-type: none"> The Proponent and its project contractors should prioritize the employment of locals, (Okarukambe Constituency) and only if necessary and due to lack of skills in the area, out-of-area people can be given some of the work. This is to avoid the influx of outsiders into the project area and surroundings The locals employed during the project phases should be provided with the necessary training of skills required for the project to minimize the number of out-of-area employees. 	Proponent:Project Manager	Pre-construction and/or Operational Phase

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Sensitize and train exploration teams/contractors about the dangers of HIV and Aids and other sexual transmitted diseases • Out-of-area workers that may be employed (due to their unique work skills) should be sensitized on the importance of respecting the local values and norms. • Construction workers or any project related worker should be prohibited from getting involved in sexual relations and/or engage in sexual activities with under-age girl children. • Within the EPL area, any construction worker who will be found or seen engaging in sexual relations with resident farming community members or a school learner shall be reported to the site manager and necessary actions taken against that worker according to the proponents or contractor code of conduct. 		
	Potential damage or disturbance to private properties	<ul style="list-style-type: none"> • The Proponent and its project contractors should inform their workers of legal or financial liabilities that may arise as a result of property loss or damages whilst undertaking exploration work (i.e. damages to farm infrastructure, accidental fires, killing of wildlife and livestock). 		

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> No worker should be allowed to walk off the exploration targets (work areas). Any worker or employees found encroaching on private property unauthorised should face disciplinary hearing and/or dealt with as per their employer's code of conduct. All workers should be presented with the exploration route map prior to accessing the project area. Site workers are not allowed to disturb wildlife or livestock, as such the collection of plants or animals is strictly should be prohibited. 		

Table 5: Operational Phase - Management Action Plans.....Continued

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
EMP training	Awareness	<p>All personnel and visiting groups to undergo EMP induction (training) for all project phases, which should include as a minimum the following:</p> <ul style="list-style-type: none"> Explanation of the importance of complying with the EMP 	Proponent: ECO	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Employees’ roles and responsibilities, including emergency preparedness • Description of specific mitigation measures within this EMP • Training shall be provided by ECO or someone who is competent to provide it and has theoretical and practical knowledge that relate to all aspects of EMP • Introduce visitor health and safety induction sessions • Conduct detailed review of the current EMP to familiarize personnel with requirements 		
Monitoring	EMP compliance	<ul style="list-style-type: none"> • The ECO or the proponent designated representative should monitor the implementation of this EMP. • Apart from daily inspections , ECO should conduct rapid EMP compliance audits on a monthly basis. 	Proponent: ECO	Continual
Employee Health and Safety	Employee OHS	<p>Establish an Occupational Health and Safety programme that should address at a minimum occupational hygiene and the mitigation measures included below:</p> <ul style="list-style-type: none"> • <u>Medical surveillance</u> of employees should be conducted for the protection of the health of employees prior and post-employment • Conduct regular occupational hazard exposure surveys in accordance with statutory standards • Correct Personal Protective Equipment (PPE) must be worn at all times by the personnel on site. Personnel must be trained on the use of PPE. • No unauthorised flammable material will be permitted on site and debris/waste shall not be burnt under any circumstances. 	Proponent: ECO	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
		<ul style="list-style-type: none"> • Erect suitable warning and information signage near any hazardous storage facility. Handling of hazardous chemicals must only be done by trained personnel. • Operators of heavy equipment shall ensure that sufficient records are kept of the nature, quantity and location of all overburden accumulated or deposited at a notifiable tip/stockpile to enable an accurate assessment of the stability of that tip/stock-pile to be made. • All provisions of the Labour Act No. 11 of 2007 in conjunction with Regulation 156, 'Regulations relating to the Health and Safety of Employees at work' must be complied with. • Safety Data Sheets (SDSs) must be readily available on site for hazardous substances. • In the event of an emergency relating to hazardous substances, procedures detailed in the SDS shall be implemented. • When trenching, ensure that there is an employee working on the surface who is able to observe the employee working in the trench. • Trenches must be provided with ladders not more than 30 m away from employees operating excavation equipment • Ensure adequate barrier is set up around excavations so as to protect employees • Provide competent signallers to control flow of traffic at major track or road junctions 		

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Soil	Top soil preservation, Sterilisation of soils as a result of hydrocarbon / chemical / waste contamination.	<ul style="list-style-type: none"> No foreign matter such as rubble, waste or hazardous material will be mixed with the topsoil or used to backfill excavation. Spills should be cleaned up immediately after the incident. Contaminated soil will be disposed of as hazardous waste at a licensed hazardous landfill facility. No waste will be buried or burned on site. 	Proponent: ECO	Continual
Air Quality	Dust generation	<ul style="list-style-type: none"> Fallout dust monitoring will also be conducted every month on a 28-day monitoring cycle. Ambient air quality will also be conducted prior to project operation, to allow for baseline comparison. At times of high winds, periodic dust suppression techniques should be employed on cleared areas generating dust. 	Proponent: ECO	Continual
Biodiversity	Loss of fauna and flora	Management action plans provided under the Construction Phase apply to this phase	Proponent: ECO Workers involved this phase	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Water Resources	Pollution	<ul style="list-style-type: none"> • Potential contaminants such as hydrocarbons (diesel) should be contained on site and disposed of in accordance with waste disposal standards so that they do not contaminate surrounding soils and eventually groundwater. • Remediation of spillages must be conducted as far as practically reasonable. A spillage prevention plan should be kept on site • An emergency spill plan should be available for major / minor hydrocarbon spills and during the transportation of the product(s) to the site. • Exploration targets must be managed in a manner that prevents pollution of drainage areas or groundwater, due to suspended solids, silt or chemical pollutants. • An inventory of all chemicals on site must be kept together with the respective SDS. • Cleaning/repair of equipment/vehicles should not be in the exploration area to prevent soil and water pollution • Storage areas containing hazardous substances/materials are to be clearly demarcated and labelled. • Were deemed appropriate , stockpile will be shaped to divert storm water around mined out sites to minimise soil erosion of the site as well as to prevent the contaminated water runoff. • Sanitary facilities shall be maintained and kept in a good order to prevent any sewage spills. 	<p>Proponent: ECO</p> <p>Workers involved this phase</p>	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
	Water Conservation	<ul style="list-style-type: none"> • Water re-use and recycling within the site operations should be encouraged. • The water volumes allocated in the water abstraction (applies to new boreholes) and use permit should be adhered to and if possible, this amount can be reduced, by abstracting and using only the actual water needed. • Awareness should be raised among all site personnel as a way to promote water conservation on site. • Excavations below the water table will require a permit from Department of Water Affairs(MAWLR) 	Project Manager ECO	Continual
Vehicular Traffic	Traffic Safety	<ul style="list-style-type: none"> • Drivers of the construction and operational vehicles should be in possession of valid and appropriate driving licenses. • Vehicle drivers should adhere to the road safety rules. • Project vehicles and machinery should be serviced regularly in order to avoid accidents as a result of mechanical faults of vehicles and machines. • Hauling should be restricted during times of low visibility • Implement one-way systems around site and in loading and unloading areas. • Provide designated turning areas 	Proponent: ECO Contractors	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Noise	nuisance	<ul style="list-style-type: none"> • Any site activities that may potentially create noise should be conducted between 08h00 and 17h00 on weekdays. • A noise assessment should be conducted during operation, to ensure that noise generation thresholds are not exceeded. • Maintain equipment in good working condition <p>For the rest of the management action plans, please refer to management action plans provided under the Construction Phase</p>	Proponent: ECO	Continual
Waste management	hazardous waste	<ul style="list-style-type: none"> • A designated waste storage site will be identified on site, • All hazardous waste will be disposed of by an accredited hazardous waste handling contractor/carrier. • Waste will not be stored for a period exceeding 90 days Or volumes exceeding 100 cubic metres. • Waste to be stored on bunded and hard standing floors • Waste generated on the proposed site should be collected by authorised waste contractors and frequently disposed of at a licensed landfill site as the last resort. Recycling/reuse of waste should be enforced where feasible. • Non-mineral waste site should be identified separately from the hazardous waste disposal area. • Authorisation from Witvlei Council for the disposal of waste at their disposal site should be obtained prior to operations. 	Proponent: ECO	Continual

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
	Environmental Pollution	Management action plans provided under the Construction Phase apply to this phase	Proponent: ECO	Continual
	Human health	<ul style="list-style-type: none"> • Carcinogenic emissions and fumes from the copper smelting process may be dangerous to human health, as such employee medical examination before employment should be conducted. • In order to discourage the unsuspecting and uniformed local community from eyeing the empty hazardous containers, if possible, holes should be drilled in these containers while kept on site (before transporting the containers to the waste site). This is also where the fencing of the site is vital throughout the two project phases to restrict unauthorized public/local site access. • Avoid the discharge of any type of waste into the general environment or private properties or into the surface water bodies or ground (and eventual infiltration into groundwater) 	Proponent: ECO	Continual
Archaeological	Impact on unknown cultural heritage sites/objects or	Management action plans provided under the Construction Phase apply to this phase	Proponent: ECO	As required

Environmental Feature	Impact	Management Actions	Responsible person(s) / Implementation responsibility	Timeframe (When?)
Community relations & Social Cohesion	Social tension	<ul style="list-style-type: none"> • Information regarding activities to be communicated through community communication channels • Develop a communication strategy and establishment of a land owners complaints and resolution committee • Ensure that contracts with subcontractors incorporate environmental management and occupational hygiene and safety requirements • Keep constant updated records of all concerns and issues logged during operations • Monitor the speed and effectiveness of remedial actions taken upon concerns and issues raised by the public • Establish guidelines for communicating pertinent OH&S, Emergency Preparedness and Response information to community representatives and social services providers(Police , Medical providers, Local fire department, Ambulance Service) • Emergency response procedures should be documented for • all anticipated hazards associated with smelting operations • Consult with interest groups and keep the local community informed on the progress of the remediation works. 	Proponent	Continual

		<ul style="list-style-type: none">• A compliance certificate shall be issued to contractor as proof that the above stated requirements have been met. Fully Implement rehabilitation plan• Conduct post rehabilitation audits		
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5. CHAPTER FIVE: ENVIRONMENTAL MONITORING ACTION

In order to reduce the "medium" and maintain the "low" significance ratings of impacts identified and assessed in the EA report, some monitoring activities are recommended.

Cuvepalm Consulting hereby recommends for the granting of the Environmental Clearance Certificate on condition that a monitoring programme that takes account of concurrent rehabilitation is implemented:

5.1. Monitoring of Selected Environmental Components

- **During the Construction period:** Weekly monitoring during the first month of construction where after Monthly audits will be conducted by the Environmental Control Officer for the remainder of the exploration phase to ensure compliance to the EMP conditions, and where necessary make recommendations for corrective action.
- **Audit Reporting (during the Construction period):** Compilation of an audit report with a rating of compliance with the EMP. The ECO shall keep a photographic record of any damage to areas outside the demarcated site exploration sites. The Contractor shall be held liable for all unnecessary damage to the environment. A register shall be kept of all complaints from the Landowners or community. All complaints/ claims shall be handled immediately to ensure timeous rectification /payment by the responsible party.
- **Environmental (during the validity period of the ECC):** Monthly Environmental inspections and EMP implementation and compliance monitoring should be undertaken throughout the project cycle. The monthly inspection reports will also be used for the compilation of the first bi-annual report, to be conducted 6 months from the date of ECC issuance. Environmental monitoring reports are to be compiled and submitted to the Department of Environmental Affairs (DEA) for archiving. This practice will make the ECC renewal easy when it is about to expire. Therefore, the Proponent should effectively monitor and submit the reports to the DEA. The submission is not only done for record keeping purposes, but also in compliance with the environmental legislation.
- **Environmental (Checklist):** In order to make impact monitoring and EMP compliance easy, the Proponent will implement an Impact-Indicator Checklist that can be used by the ECO every month.
- **Groundwater:** the risk of groundwater contamination from the proposed project is moderately high,, given the planned pollution measures, the Environmental Consultant recommends that the Proponent consider establishing a baseline and monitoring points .This can be done by sampling water from monitoring boreholes .Water level monitoring will be done every month, whilst water quality monitoring **will** then be done on a quarterly basis.

During the wet seen, any the protrusion of water in dug out areas may be expected. Ponding water will be monitored and samples will be collected monthly for laboratory analysis.

The following parameters would be monitored:

- pH, electrical conductivity (EC), total dissolved solids (TDS), Biological oxygen demand (BOD), sulphates, total organic nitrogen, calcium phosphorus, magnesium, potassium,

sodium, ammonium nitrogen, chloride, nitrate-nitrogen, nitrite-nitrogen, potassium, total dissolved phosphorus, bicarbonate, dissolved organic carbon, an ion balance

- Screening (presence/absence) for *E. Coli*,

The section below provide for **general monitoring** requirements for parameters and shall be implemented in conjunction with dust fall out monitoring.

Table 5: Monitoring Parameters

	Particulars	Monitoring Frequency	Method of Sampling	Parameters
A	Water Quality			
	Monitoring Boreholes – (Adjacent- 1km radius)	Monthly	SANS 5667-10	Parameters specified under Water Act 54 of 1954 -Guidelines
	Monitoring Boreholes – (Distant- 5 km radius upstream)			
B	Ambient Air Quality (off-site)			
	All sensitive receptors	Quarterly	manual procedure	PM10, PM2.5, SO2
	Sensitive receptors (monitoring points)	Quarterly	manual procedure	PM10, PM2.5, SO2
C	Industrial Noise			
	Staging areas ,Field Camps	Quarterly	8 hr continuous with 1 hr interval, SANS10083	Noise levels in dB(A)
D	Ambient Noise			
	Farm Houses/Residential Area	Quarterly	8 hr continuous with 1 hr interval, SANS10083	Noise levels in dB(A)

- **Fallout Dust:** Air quality is monitored to measure the amount of dust fall out. This is to see how air quality is affected by activities of smelting operations, and the possible impact on neighbouring sensitive receptors. The dust fall out monitoring should be designed primarily to study long-term trends of particulate matter as collected for chemical analysis Due to a lack of guidelines on ambient air quality standards in Namibia, the consultant recommends depositional dust monitoring results will be compared to the dust fallout limits as provided by the South African National Standard (SANS) limit of 600 mg/m²/day as an average value over a 28 – 32-day period being the limit value for residential and human habited areas within a 2km radius area.

SANS (1929:2011) AMBIENT AIR QUALITY EVALUATION CRITERIA FOR DUST DEPOSITION

LEVEL	DUST FALL RATE (mg/m ² /day)	AVERAGING PERIOD	PERMITTED FREQUENCY OF EXCEEDING DUST FALL RATE
Action Residential	D < 600	30 days	Three within any year, no two sequential months
Action Industrial	D < 1200	30 days	Three within any year, not sequential months

Alert Threshold	D < 2400	30 days	None. First incidence of dust fall rate exceeded requires remediation and compulsory report to relevant authorities
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5.2. Environmental awareness

Contractors shall ensure that its employees and any third party who carries out all or part of the Contractor's obligations are adequately trained with regard to the implementation of the EMP, as well as regarding environmental legal requirements and obligations. Training shall be conducted by the ECO where necessary.

Environment and health awareness training programmes should be targeted at three distinct levels of employment, i.e. the executive, middle management and labour. Environmental awareness training programmes shall contain the following information:

- The names, positions and responsibilities of personnel to be trained.
- The framework for appropriate training plans.
- The summarized content of each training course.
- A schedule for the presentation of the training courses.
- The ECO shall ensure that records of all training interventions are kept in accordance with record keeping and documentation control requirements as set out in this EMP. The training records shall verify each of the targeted personnel's training experience.

5.3 Reporting and Communication procedures

A communication plan shall be prepared and implemented for the purpose of both internal and external communication, ways to collect , report and respond to environmental queries , complaints and client feedback and dissemination of information.

The following Table outlines various means of communication

Table 6: Means of communication

Means of communication	Frequency	Purpose/Action	Responsibility
Site Environmental Log Book	Continually	Written records of what has been observed and done related to environmental issues and corrective action	ECO
Site Meetings	Monthly	Environmental Performance Reporting	ECO
Environmental briefs/safety training	Monthly	Training provided to employees and subcontractors	ECO/EAP
Environmental Complaint Log	Quarterly	Handling of all complaints reported	ECO

6. Chapter Six: Rehabilitation Plan

6.1. Introduction.

Rehabilitation by definition is the act of restoring something close to its original state. This is important aspect in Environmental Management. Planning for rehabilitation makes progressive rehabilitation easier. Rehabilitation is the proponent's responsibility. The extent of 'rehabilitation' to an area disturbed by exploration can range from where an area is brought to as near as possible to pre-exploration state or condition, to re-contouring and re-vegetating to a state that is not contaminated and compatible with environmental regeneration and community expectations. The proponent may submit a rehabilitation plan to MEFT prior to the commencement of exploration and rehabilitation audit report prior to project closure.

In respect of proposed project, rehabilitation in short shall include the following:

- The stripping and stockpiling of the upper six inches of soil is a key component of rehabilitation. Stock piles with valuable soil may be seeded and only used for rehabilitation purposes.
- Slope reduction: Exploration sites often end up with very unstable and steep depressions and vertical work faces. To lessen the risk of trench collapse and erosion due to surface runoff, these faces shall be reduced to gentler grades. Flatter inclines permit the seeding and growth of plants and are more suitable to other forms of land use.
- All garbage, supplies and equipment are taken from the site.
- Dug out areas should not be used for the disposal of domestic, industrial or toxic waste given the potential for contaminating ground water.

6.2. Objective

In this case, the objective of rehabilitation is to ensure that unusable land is returned to a state of usefulness by,

- i.* Eliminating unacceptable health hazards and ensuring public safety
- ii.* Restoring the site to a condition that is visually acceptable to the community
- iii.* Reclaiming the areas impacted for future use (agricultural for example)
- iv.* Preparing the site to be amenable to support vegetation
- v.* Removing any contaminated soils
- vi.* Ensuring physical stabilization of the soils (a combination of smoothing and contouring slopes, replacing overburden and topsoil and re-vegetating).
- vii.* Ensuring that final drainage of the site does not accelerate soil erosion.

Rehabilitation should whenever possible be carried out concurrently with ore extraction and as practical the after use of the site after decommissioning should be considered when planning for exploration.

6.3. Rational

In the past, reclamation/rehabilitation of exploration areas has not been a major environmental concern to the public in Namibia. Although the exploration target disturbed deemed small (area), the combined impacts can be substantial. Already, abandoned exploration targets that remain rehabilitated are posing a lot of problems to the host communities, wildlife and the environment. Among the problems are:

- Threat to public safety due to dangerous open trenches
- Livestock injuries
- Wildlife injuries and drowning(wet seasons)
- Land degradation and desertification.
- Visual degradation

The benefits of remediating the site can be widely recognized if the PRP has been adopted. When progressive rehabilitation is conducted, risks cited above can be mitigated effectively.

6.4 Proposed Rehabilitation Plan (PRP)

The PRP describes a framework that can be used during site rehabilitation .The proponent is encouraged to utilise internationally recognised guidelines. Hence "Rehabilitation plan" means NHIG written proposal as required and approved by the Department of Environmental Affairs for reclaiming of the affected land, which shall include but not be limited to:

- i. Proposed practices to protect subterranean water resources;
- ii. Specifications for surface gradient restoration to a surface suitable for subsequent(post exploration) use of the land after reclamation is completed, and proposed method of accomplishment thereof
- iii. Manner and type of revegetation method of the affected areas;
- iv. Method of prevention or elimination of conditions that will be hazardous to wildlife life , livestock and farming community;
- v. Method of compliance with air and water pollution prevention laws where applicable;
- vi. Sketch maps and other supporting documents as may be reasonably required by the Department of Environmental affairs;
- vii. A time schedule delineating events to meet the requirements.

The proponent must follow the procedure outlined below.

i. After use selection

The first step and prior to decommissioning is the selection of the after-use management activity. The after-use management must be compatible with consideration of the surrounding land-use. Financial resources must be set aside to cover rehabilitation process to acceptable level.

ii. Spreading of the stockpiled topsoil/overburden

The graded slope sides can be spread over by stockpiled topsoil and overburden to encourage revegetation.

iii. Revegetation

Vegetation increases stability by binding the soil together and act as a measure of reducing the erosion on these slope slides. The vegetation also improves the soil structure of the slides. Many vegetation species can be grown starting from indigenous to exotic species, the choice of the vegetation type depending on many factors. The following revegetation principles derived from (Strobach. M In: Jeltsch et al ,2010) can be adopted.

- For any effort for veld regeneration, it is much more viable to create many smaller, ‘fertile islands’ comprised of strips of about 50 m by 3–5 m, that are distributed throughout the farm, rather than to try and restore an entire continuous area.
- Soils that are bare and un-vegetated usually have a relatively thick, impenetrable upper layer that often forms an ecological barrier to the establishment of plants. This layer needs to be ripped open to at least 25 cm depth, preferably more. It will be more effective to do few, deep rips with a single ripping implement than many shallow rips. •
- No matter how flat the area appears to be, it is advisable to always rip along a slight contour, with the lowest point in the direction of the water runoff. In this manner resources such as soil, seed and organic matter, which are washed off bare areas become trapped and accumulate to help enrich the restored patches, which can then grow bigger by themselves over time.
- Often, it may be necessary to sow in seeds of perennial grass species. It may be possible to purchase some seeds, but then it is advisable to use species always that occur naturally in the area. Road verges are usually a good source for collecting seeds. However, since all grass seeds have an inherent dormancy of 7–10 months, they should be collected during the season prior to when the ripping takes place.
- • Timing: rip early in the growing season, preferably just after and within days of the first rains (> 5 mm).
- If grass is sowed, it should be done sparingly to avoid creating patches of preferential grazing(post exploration) . After sowing loosely, cover the seeds with cut bushes to protect the seedlings from being grazed during the first year.
- Furthermore, given that birds appear to be attracted to tall trees across all savanna types (Kaphengst & Ward 2008, Seymour & Dean 2009 In: Strobach 2004), proponent is encouraged to retain the taller trees. This would not only benefit t biodiversity but would also provide shade for livestock and contribute to nutrient cycling processes.
- Clearing teams might be tempted to use bulldozers to uproot shrubs that are difficult to chop down. Where possible avoid using heavy machinery for vegetation clearing. This increases the risk of soil erosion by disturbing the soil surface.
- When clearing , leave the fines for post exploration rehabilitation: It is not recommended that twigs be compressed to make woodchips, as has been suggested by some, since these twigs improve soil moisture, soil organic matter and increase nutrient levels in soils after mineralization, which improves grass production and quality.
- Leave at least one or two large dead trees per hectare. This increases available cavities for cavity users, and perches for larger birds such as raptors.
- Where practically feasible , leave representatives in all height classes of all species: This increases niches and species diversity. Tall trees are more suitable for cavity users, and for bird species with large nests.
- Tall trees also increase grass production. Smaller trees and bushes are suitable for medium sized browsers and species of birds and other animals that require shelter.

iv. **Trench refill**

Trenches can be filled using overburden and spoil material

v. **Post rehabilitation management**

The project must take into consideration the following factors when selecting an appropriate a post rehabilitation management program:

- *Surrounding land uses – present and future*

- *Surrounding ecological/natural heritage systems*
- *Stakeholder input (neighbours, municipalities, special interest groups, partners)*
- *Method of extraction (depth, proximity to water table)*
- *Available resources (topsoil, overburden, seed bank, transplanting opportunities)*

7. CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

Cuvepalm Consulting cc are confident that the potential negative impacts associated with the proposed project activities, can be adequately mitigated by the effective implementation and monitoring of recommended management action plans contained in this document. Therefore, it is recommended that the proposed project granted an Environmental Clearance Certificate, provided that:

- All mitigations provided in this EMP should be implemented as stipulated;
- All required permits, licenses and approvals for the proposed project are obtained as required (please refer to the Permitting and Licensing in Table 2 of this EMP);
- The Proponent and all their engineers and contractors comply with the legal requirements governing this type of project and its associated activities;
- A Monthly Environmental Compliance inspection should be conducted;
- Water quality monitoring should be conducted to prevent pollution.
- Environmental monitoring requirements recommended are adhered to; and
- All the necessary environmental and social (occupational health and safety) precautions provided are adhered to.
- That the proposed rehabilitation plan be updated and submitted to MEFT for approval prior to implementation and decommissioning.

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