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Draft Environmental Management Plan (EMP)

The Proposed Exploration and Small-Scale Mining Activities on Eight (8) Mining Claims No. 74188 - 74195 North of Karibib in Erongo Region, Namibia- An Application for Environmental Clearance Certificate (ECC)

MEFT Application No.: **APP-01423**

Proponent: **Ndawanenwa Mineral Exploration CC**
P. O. Box 2329 Swakopmund, Namibia

June 2023

DOCUMENT INFORMATION

Title: Draft Environmental Management Plan (EMP) for the Proposed Exploration and Small-Scale Mining Activities on Eight (8) Mining Claims No. 74188 - 74195 North of Karibib in Erongo Region, Namibia - An Application for Environmental Clearance Certificate (ECC

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Date:	June 2023

EAP* - *Environmental Assessment Practitioner*

SERJA' STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the Environmental Scoping Assessment (ESA) Study and Prepare this Draft Environmental Management Plan (EMP) for Proposed Exploration and Small-Scale Mining Activities on Eight (8) Mining Claims No. 74188 - 74195 North of Karibib, Serja Hydrogeo-Environmental Consultants cc declare that we:

- do not have, to our knowledge, any information or relationship with the Proponent (Ndawanenwa Mineral Exploration cc), the Ministry of Environment, Forestry and Tourism (MEFT)'s Department of Environmental Affairs and Forestry (DEAF) or the Competent Authority (Ministry of Mines and Energy (MME) that may reasonably have potential of influencing the outcome of this Environmental Assessment and the subsequent Environmental Clearance Certificate applied for.
- have knowledge of and experience in conducting environmental assessments, the Environmental Management Act (EMA) No. 7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulation as well as other relevant national and international legislation, guidelines, policies, and standards that govern the proposed project as presented herein.
- have performed work related to the ECC application in an objective manner, even if the results in views and findings or some of these may not be favorable to the Proponent.
- have complied with the EMA and other relevant regulations, guidelines and other applicable laws as listed in this document.
- declare that we do not have and will not have any involvement or financial interest in the undertaking/implementation of the proposed project, other than remuneration (professional fees) for work performed to conduct the ESA and apply for the ECC in terms of the EIA Regulations' requirement as an Environmental Assessment Practitioner (EAP).

Disclaimer: Serja Hydrogeo-Environmental Consultants will not be held responsible for any omissions and inconsistencies that may result from information that was not available at the time this document was prepared and submitted for evaluation.

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Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: June 2023

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LIST OF ABBREVIATIONS

DEAF: Department of Environmental Affairs and Forestry

DWA: Department of Water Affairs

ECC: Environmental Clearance Certificate

ECO: Environmental Control Officer

EIA: Environmental Impact Assessment

EMA: Environmental Management Act

EMP: Environmental Management Plan

ESA: Environmental Scoping Assessment

GG: Government Gazette

GN: Government Notice

I&APs: Interested and Affected Parties

MAWLR: Ministry of Agriculture, Water and Land Reform

MCs: Mining Claims

MEFT: Ministry of Environment, Forestry and Tourism

MME: Ministry of Mines and Energy

PPE: Personal Protective Equipment

SHE Officer: Safety, Health & Environment Officer

1 INTRODUCTION

1.1 Project Background and Location

Ndawanenwa Mineral Exploration CC (hereinafter referred to as the Proponent) has applied to the Ministry of Mines and Energy (MME) on the 27th of February 2023 to be granted the rights explore and at a small-scale, mine Industrial Minerals (lithium) on eight (8) Mining Claims (MCs) No. 74188, 74189, 74190, 74191, 74192, 74193, 74194 and 74195 (hereinafter collectively referred to as MC74188 – 74195). The MCs are located on Farm Daheim No. 106, about 15km north of Karibib in the Erongo Region. The eight MCs cover a combined area of 118.225 hectares (Ha) - please refer to the locality maps in Figure 1-1 and Figure 1-2.

For MME to consider the granting of the exploration and mining rights on the MCs, the Proponent is required to obtain an Environmental Clearance Certificate (ECC) and submit to the MME).

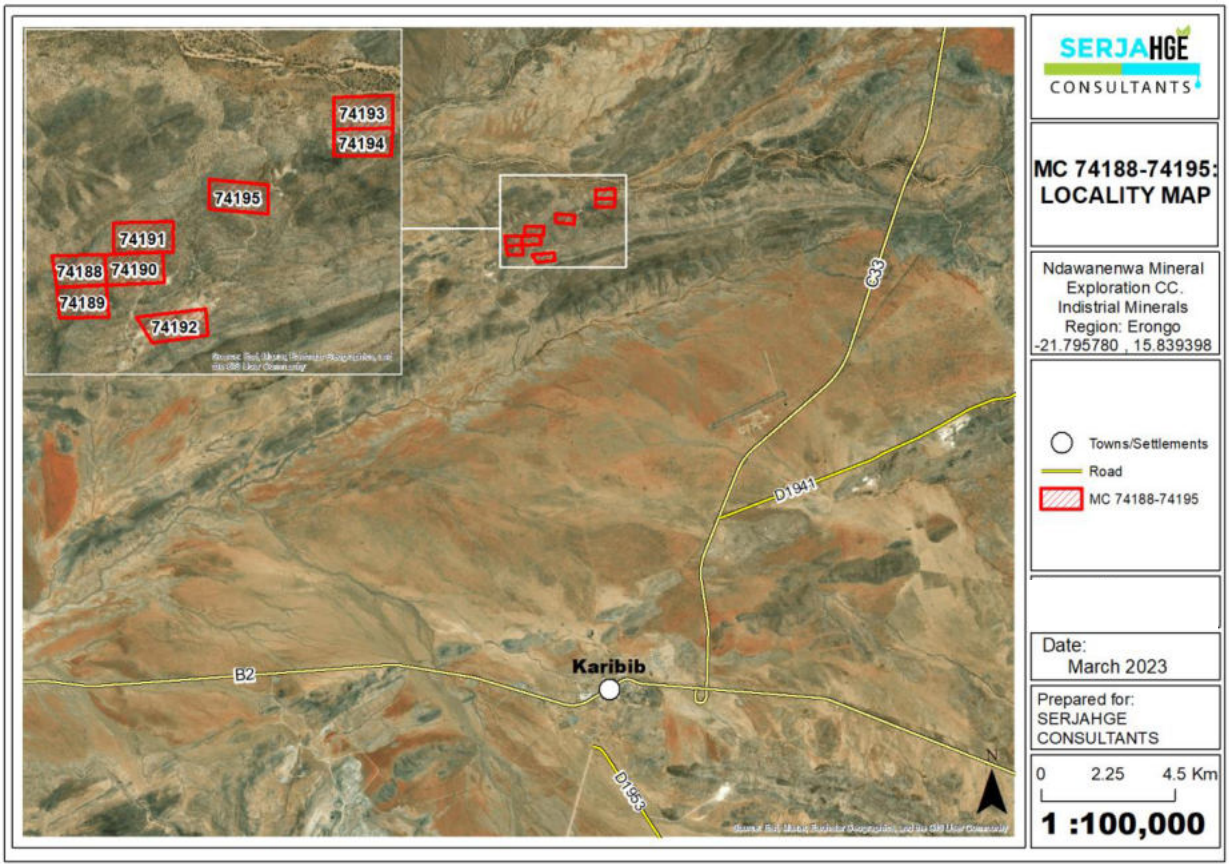

Figure 1-1: Locality map of the eight Mining Claims (MCs). No. 74188 – 74195) north of Karibib

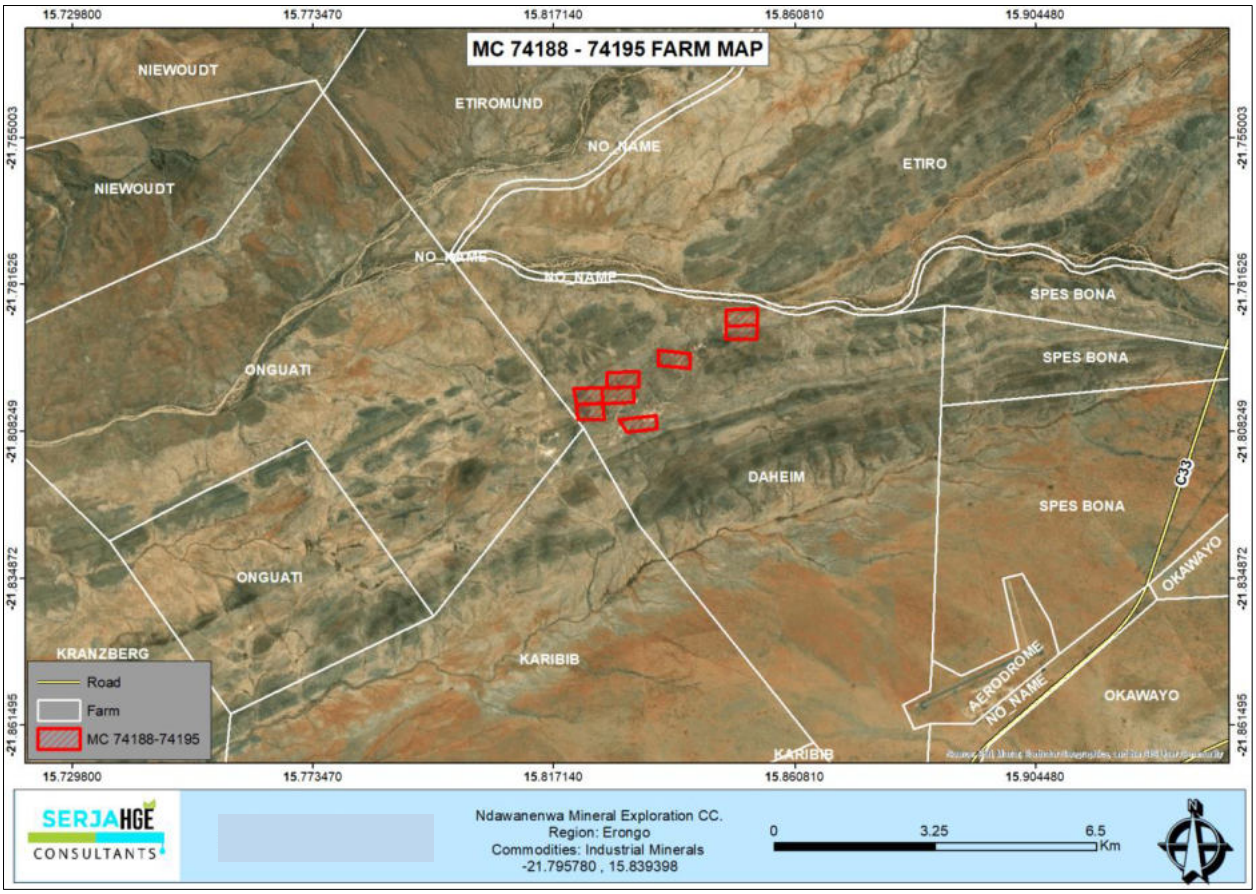

Figure 1-2: Locality map of the MCs inside Farm Daheim No. 106

1.2 Purpose of the Draft Environmental Management Plan (EMP)

The Draft EMP is developed in accordance with Regulation 8(j) of the EIA Regulations (2012) that it should be included as part of the Environmental Assessment (EA) scoping report. 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 EA process as it synthesizes all the proposed management & mitigation and monitoring actions, set to a timeline and with specific assigned responsibilities. It provides a link between the impacts identified in the EA process and the required mitigation measures to be implemented during exploration. It is important to note that an EMP is a statutory 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 can 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 activities, namely: planning, exploration and mining, and decommissioning & rehabilitation. The anticipated phases of the proposed project are briefly described below:

- **Planning Phase -** This is the stage of the proposed project during which the Proponent prepares all the administrative and technical requirements needed for the planned exploration and mining activities. The planning includes things like obtaining the necessary permitting and authorization from relevant national and local stakeholders, facilitating the recruitment and services and required goods procurement processes, etc., in preparation for exploration and mining activities.
- **Exploration and Mining phase -** This is the phase when Ndawanenwa Mineral Exploration will carry out the exploration and mining activities on the eight mining claims.
- **Decommissioning and Rehabilitation** – The phase during which the mining activities and associated works at the MCs cease. The decommissioning of the activities may be considered because of poor results (depletion of the lithium ore) or declining in the commodity market price. Before the decommissioning phase, the Proponent will need to put site rehabilitation measures in place.

This Draft EMP will be used by the Proponent, employees and/or contractors to implement management measures to address the environmental impacts to ensure that adverse impacts on the environment are avoided or limited if they cannot be avoided completely, while maximizing the positive impacts.

2 BRIEF DESCRIPTION OF THE PROPOSED PROJECT ACTIVITIES

Prior to mobilizing to site and undertaking any groundwork for the proposed activities at the site, the Proponent will be required to sign land access and use agreements with the affected landowner (farmer) according to Section 52 (1) (a) of the Minerals (Prospecting and Mining) Act No. 33 of 1992.

2.1 Proposed Exploration Activities

The exploration approach for the commodity will be carried out as per the following methods as listed below and presented under the subsections below.

- Geological mapping (Non-invasive technique): The exploration program will commence with a review of geological maps and historical drilling and / or exploration data for the area, if any. Geophysical surveys form part of this technique, which will entail data collection of the substrata. Ground geophysical surveys are also conducted, where necessary using vehicle-mounted sensors.

- Lithological sampling (invasive technique): these activities may last from between one week to a month at a time over specific areas, until the explored area is fully sampled as desired. This will entail rock and soil sampling consists of small pits/trenches.
- Drilling (invasive technique): Should analyses of soil/rock samples by an analytical laboratory be positive, holes are drilled, and drill samples collected for further analysis. This programme may initially range from two weeks to a month at a time, depending on the planned programme or based on the results of the programme. The Proponent undertakes to work with all relevant stakeholders to keep them informed of exploration progress to facilitate site visits and access to ongoing field exploration programmes.

  The anticipated drilling method will be Reverse Circulation (RC) and diamond-core drilling RC drilling uses a pneumatic hammer, which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample, which is comprised of rock chips. It is relatively quicker and cheaper when compared to other techniques like Diamond Drilling. However, diamond drilling may also be considered for this exploration programme, for better geological control and to perform processing trials.

  A typical drilling site will consist of a drill-rig and support vehicles as well as a drill core and geological samples store. A drill equipment parking and maintenance yard may be set up (including a fuel and lubricants storage facility).

2.2 Mining of Industrial Minerals

During this phase, extraction (mining) of industrial minerals and all associated mining activities will be carried out on site. Both invasive and non-invasive activities as in the exploration stage will be implemented to recover the industrial mineral (lithium) ore. Invasive activities will involve trenching/pitting and drilling for an open pit mining.

A period of 10 years of small-scale mining is predicted. The selection of the potential mineralization model and mineral targets will be based on the local geology, trenching, and assay results of the samples collected. No explosives will be used onsite.

It should be noted that there will be no ore processing onsite. Therefore, processing is not provided for in this EIA Report nor its EMP.

3 LEGAL FRAMEWORK: PERMITTING AND LICENSES

The Proponent has the responsibility to ensure that the exploration activities as well as the EA process conform to the principles of the EMA and must ensure that employees act in accordance with such principles. Table 3-1 below lists the requirements of an EMP as stipulated by Section 8 (e) of the EIA Regulations, primarily on specific approvals and permits that may be required for the activities on the MCs.

Table 3-1: List of legal requirements and permits to the activities on the mining claims

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Environmental Management Act EMA (No 7 of 2007)	Requires that projects with significant environmental impacts are subject to an environmental assessment process (Section 27). Details principles which are to guide all EAs.	The EMA and its regulations should inform and guide this EA process. Should the ECC be issued to the Proponent, it should be renewed every 3 years, counting from the date of issue. Contact details at the Department of Environmental Affairs and Forestry (DEAF), Ministry of Environment, Forestry and Tourism (MEFT), Office of the Environmental Commissioner **Mr. Timoteus Mufeti** **Tel: +264 61 284 2701**
Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878)	Details requirements for public consultation within a given environmental assessment process (GN 30 S21). Details the requirements for what should be included in a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).	
Minerals (Prospecting and Mining) Act (No. 33 of 1992)	Section 48 (3): To enable the Minister to consider any application referred to in section 47 the Minister may (b) require the person concerned by notice in writing to (i) carry out or cause to be carried out such environmental impact studies as may be specified in the notice.	The Proponent should ensure that all necessary permits/authorization for the mining claims are obtained from the Ministry of Mines and Energy (MME). Contact person and details at the MME (Mining Commissioner) **Mrs. Isabella Chirchir** **Tel: +264 61 284 8251.**
	Section 52 (1) (a) requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder.	**The Proponent should timely enter into and sign access and land use agreement (consent) with the respective affected farm owner (Farm Daheim) prior to undertaking any activities on the MCs (including mobilization).**

Legislation/Policy/ Guideline	Relevant Provisions	Implications for this project
Water Resources Management Act (No 11 of 2013)	Ensure that the water resources of Namibia are managed, developed, used, conserved, and protected in a manner. **Therefore, in case of drilling a new water borehole, a Borehole Drilling Permit should be applied for. In addition, prior to utilizing the boreholes water, a Groundwater Abstraction & Use Permit should be applied for. The Permit is required for all commercial and industrial water uses.**	The Water Permit should be applied from the Ministry of Agriculture, Water and Land Reform (MAWLR) **Department of Water Affairs (DWA)** **Contact: Mr. Franciskus Witbooi Division: Water Policy and Water Law Administration Division** **Tel: +264 61 208 7158**
	For any project wastewater planned for discharge into the environment, **a discharge permit should be applied for and obtained.**	**MAWLR, DWA' Water Environment Division** **Contact: Ms. Elise Mbandeka** **Tel: +264 61 208 7167**
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area"	The Proponent should obtain the necessary authorisation form the MME for the storage of fuel on-site (Consumer Installation Permit). **Mr. Carlo Mcleod** (Ministry of Mines and Energy: Acting Director – Petroleum Affairs) Tel: +264 61 284 8291
National Heritage Act No. 76 of 1969	Call for the protection and conservation of heritage resources and artefacts.	Should any archaeological material, such as bones, unknown graves, old weapons/equipment etc. be found on the MCs' site, work should stop immediately, and the National Heritage Council (NHC) of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material. Contact Details at the NHC of Namibia **Mrs. Erica Ndalikokule – NHC Director** **Ms. Agnes Shiningayamwe (Heritage Officer)** **Tel: +264 61 301 903**

4 EMP IMPLEMENTATION RESPONSIBILITIES

Ndawanenwa Mineral Exploration cc (the Proponent) and their partners (if any) is ultimately responsible for the implementation of the EMP. However, the Proponent may delegate this responsibility or part of it to someone else at any time, as they deem necessary. The roles and responsibilities of all delegates/parties involved in the effective implementation of this EMP are set in Table 4-1.

Table 4-1: The EMP implementation responsibilities for prospecting and exploration

Role	Responsibilities
Ndawanenwa Mineral Exploration (Proponent) with Partners and or their Representative	-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 and issuing fines for contravening EMP provisions.
Exploration & Mining Manager	This individual will be responsible to ensure that the exploration and mining activities of the project are completed on time. The Manager's duties and responsibilities will include: -Ensure that relevant commitments contained in the EMP are adhered to. -Ensure relevant staff is trained in procedures entailed in their duties. -Maintain records of all relevant environmental documentation for the project. -Reviewing the EMP annually and amending the document when necessary. -Issuing fines to individuals who may be in breach of the EMP provision and if necessary, removing such individuals from the site. -Cooperate with all relevant interested and affected parties/stakeholders. -Development and management of schedules for daily activities
Environmental Control Officer (ECO) / Safety, Health & Environment (SHE) Officer	The Proponent may assign the responsibility of ensuring EMP compliance throughout the project life cycle to a designated member of staff or external qualified and experienced person, referred to in this EMP as the Environmental Control Officer (ECO) / SHE Officer. The ECO will have the following responsibilities: -Management and facilitation of communication between the Proponent, PR and Interested and Affected Parties (I&APs) regarding this EMP. -Conducting site inspections of all areas with respect to the implementation of this EMP (monitor and audit the implementation of the EMP). -Advising the Proponent or Exploration & Mining Manager 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.

Role	Responsibilities
	-Undertaking an annual review of the EMP and recommending additions and/or changes to this document. -Ensuring that the project activities on site are conducted in accordance with the International System organization (ISO) standard 14001: 2015.
Public Relations Officer (PRO)	The PRO will be responsible for the following tasks: -Liaising between the stakeholders, hosting farmer (property owner), public and the Proponent. -Ensure effective communication with stakeholders (farm owner), media (if necessary) and the public. -Organising and overseeing public relations activities, Managing public relations issues. -Preparing and submitting public relations reports, if required. -Collaborating with personnel and maintaining project-related open communication among personnel.

5 ENVIRONMENTAL MANAGEMENT AND MITIGATION MEASURES

5.1 Key identified Potential negative Impacts

The key potential positive and negative impacts identified, described, and assessed in the Environmental Scoping Assessment Report and for which the management measures (action plans) have been provided are listed below:

Positive impacts:

- Local socio-economic development through employment creations to locals,
- Payment of land access fees to the landowner, this will also include payment of rental fees for setting up structures such as temporary office structures, and if necessary, camp onsite.
- Improving certain services on the farms such as donation of water boreholes for holes in which water is encountered during drilling (after completion of exploration and mining works). This will also include installing new gates at utilized farm sections with small gates (to gain access to such areas) and the old gates needs to be removed (to enable easy access for heavy machinery).
- Procurement of local goods and services by local businesses to generate income.
- Boosting of the local economic growth and regional economic development.

Negative (adverse) impacts:

- Physical disturbance of site soils,
- Impact on local biodiversity (fauna and flora); potential illegal harvesting of protected vegetation and wildlife hunting (poaching) and habitat disturbance in the area, as well as livestock theft,
- Impact on local biodiversity (fauna and flora) and habitat disturbance,
- Potential impact on water resources and soils (over-abstraction of water and pollution),
- Air quality (compromise the surrounding air quality) due to dust generated from the project activities such as drilling, trenching and movement of heavy trucks on unpaved access roads.
- Visual impacts due to unrehabilitated disturbed site areas as result of trenching, and drilling,
- Potential occupational & social health as well as safety risks (trenches and drilled holes risk to livestock, wildlife and people).
- Noise associated with project activities such as drilling,
- Accidental fire outbreaks related to the project activities.
- Vehicular traffic safety & impact on local roads,

- Environmental pollution (littering from solid waste as well as mishandled wastewater),
- Potential social nuisance and conflicts (theft, damage to properties, etc.), and
- Archaeological and cultural heritage impact (during trenching and drilling).

5.2 The Environmental Management Measures and Rehabilitation of Sites

The management actions are aimed at avoiding the above-listed potential negative impacts, where possible, and where it is impossible to avoid these impacts, measures are provided to reduce the impacts' significance.

The Management action plans (mitigation measures) recommended for the potential impacts rated in the ESA Study were based on the following project stages (phases):

- Planning, Exploration and Mining phases (Table 5-1),
- Site Rehabilitation and Decommissioning (Table 5-2),
- Biophysical and Social Environmental Monitoring (Table 5-3), and
- Decommissioning and Rehabilitation Measures: Post-Mining Activities (Table 5-4).

Table 5-1: The Environmental management and mitigation measures for Planning, Exploration & Mining activities

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Planning Phase					
EMP implementation and training	Lack of EMP awareness and implications thereof	-A Comprehensive Health and Safety Plan for the project activities should be compiled. -An EMP non-compliance penalty system should be implemented on site. -The Proponent should appoint an Environmental Control Officer (ECO) or SHE Officer to be responsible for managing the EMP implementation and monitoring.	-All required EMP implementation Plans, and Systems are compiled and in place. -ECO is appointed	-Proponent	Pre-exploration
Authorizations	Lack of Agreements, Permits/ Licenses	-All the required agreements and licenses or permits should be applied for and signed, respectively before commencement of work on the mining claims, or as required. -The permits, agreements referred to herein include: (a) Land access by the farm owners (landowners). (b) Waste management disposal permits from the relevant facility operator/owner (c) Water supply agreements for domestic use or groundwater abstraction & use permit (if abstracting drilling water directly from a borehole, however, this is unlikely given the low groundwater potential of the area to supply activities such as drilling) (d) Storage permit from MME for any fuel stored onsite	-Applicable permits and licenses to obtained from relevant authorities. -Agreements/permits signed and obtained from on time, minimum of 2 months notification (or as per agreements with the farm owner) prior to the planned commencement date of works.	-Proponent	Pre-exploration

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Communication between the Proponent and landowners	Lack of communication (proper liaison) between landowner and Proponent with regards to land use/access	-The Proponent should appoint a Public Relation Officer (PRO) to liaise with the landowner. -A clear communication procedure/plan which should include a grievance mechanism should be developed.	-Ongoing Consultation with farmers throughout the project, when and as required. -PRO contact details provided to landowner -Complaint's logbook	-Proponent	PRO appointment (Prior to project activities) and their responsibilities throughout the project activities
Employment	Creation of employment opportunities	-Un and semi-skilled labour should be sourced from the local communities. -Preference of local people for employment for jobs should be implemented, i.e., permanent residents from the farms should be employed for the unskilled labour preferentially to out-of-area people (outsiders) where possible. Out-of-area employment should be justified, for example by the unavailability of local skills. -Equal opportunity should be provided for both men and women, when and where possible.	-Number of locals employed for project activities	Proponent in collaboration with the Drilling contractors	Pre-exploration and when necessary, throughout
Land use fees and associated fees for socio-economic development	Local socio-economic development	-Commit to the conditions listed in the land access agreements signed with farmers (landowners). -The payments of land access fees should be made as agreed. -Plan for exploration holes in which groundwater will be encountered, and inform the farm owner to decide if they would like to keep the borehole(s) for their own use after exploration. The Proponent should equip the borehole(s) for the farmer(s).	-Proof of funds paid to the respective farmers' bank account and related records.	-Proponent	Pre-exploration and when necessary, throughout
Specialised procurement of services and goods	Empowerment of local businesses	-All services related to exploration activities such as trenching, site establishment, and drilling that the Proponent may need, preference and available, locally and regionally, priority should	-Number of hired contractors.	-Proponent -Exploration and Mining Manager	Pre-exploration and mining

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		be given to local and regional businesses for such services and goods.	-Record of hired or contracted companies or services providers		
Exploration and Mining Phases					
EMP implementation and training	Lack of EMP awareness and implications thereof	-EMP trainings should be provided to all workers on site. -All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their respective work. -The implementation of this EMP should be monitored. The site should be inspected, and a compliance audit done throughout **the project activities, monthly and bi-annually for overall EMP implementation.** An EMP non-compliance penalty system should be implemented.	-Records of EMP compliance/monitoring conducted bi-annually -The ECC is renewed every 3 years -Records of EMP training conducted.	-Exploration & Mining Manager -ECO	Throughout the project phases
Communication between the Proponent and landowners	Lack of communication (proper liaison) between landowners and Proponent with regards to land use/access	-The PRO should be introduced to the farm owners and his or her contact details provided to them prior to undertaking activities for easy communication. -The Proponent should compile a clear communication procedure / plan which should include a grievance and response mechanism.	-PRO is part of the project personnel. -Community and farmers' grievances addressed to their satisfaction -Complaint's logbook -Land access agreement conditions are set	-PRO	Throughout the project phases
Grazing land	Loss of grazing areas	-Any unnecessary removal or destruction of grazing land, due to exploration and mining activities should be avoided. -Vegetation found on the site, but not in the targeted exploration and mining areas should not be removed but left to preserve biodiversity and grazing land. -Drilling mud and any other fluid used onsite should not be dispose of on top of the vegetation (grass or shrubs) onsite. The	-Limited cleared sites -Less access tracks -No complaints from farmers regarding significant land/vegetation clearing	-Exploration & Mining Manager -ECO	Throughout the project phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		fluids should be properly stored in designated containers onsite and disposed of at the nearest appropriate waste facility. -Workers should refrain from driving off road and creating unnecessary tracks that may contribute to loss of grazing land. -Environmental awareness on the importance of the preservation of grazing land for local livestock should be provided to the workers.			
Water Resources Use	Over-abstraction (water demand and availability)	-Fresh water abstracted from boreholes or supplied by carting should be used efficiently, and recycling and re-using of water on certain site activities should be encouraged. -The Proponent should cart water for drilling from elsewhere outside the site area to relieve pressure of the available resources. Agreements for water supply should be made between the willing water supplier and the Proponent. -If intending on drilling a new borehole for the project, a Borehole Drilling Permit should be applied for from MAWLR prior to drilling. -If the water is directly abstracted from a certain borehole or boreholes offsite, the Proponent should apply for a Groundwater Abstraction & Use Permit from the Department of Water Affairs of MAWLR. -If water some of the project water is supplied by the farmer owner, a water supply agreement should be signed prior to obtaining the water. -Water reuse/recycling methods should be implemented as far as practicable such that the water used to cool off exploration equipment should be captured and used for the cleaning of project equipment, if possible. -Water storage tanks should be inspected daily to ensure that there is no leakage, resulting in wasted water on site.	-Water supply agreements -Proof/ recording/ quantification of water saving efforts. -Water supplier -Water supplying agreements -Water storage tanks on site	-Proponent -Exploration & Mining Manager	-Once off supply agreement -Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Water conservation awareness and saving measures training should be provided to all the project workers in both phases so that they understand the importance of conserving water and become accountable.			
Soils	Physical soil/land disturbance and loss of topsoil	-Stockpiled topsoil and drill materials should be used to backfill the excavated and disturbed site areas/spots. -The topsoil that was stripped from certain site areas to enable project works and can be returned to its initial position, should be returned. This is to avoid unnecessary stockpiling of site soils which would leave them prone to erosion. -Soils that are not within the intended footprints of the site areas should be left undisturbed and soil conservation implemented as far as possible. -Project vehicles/machinery should stick to access roads provide and not to unnecessarily create further tracks on and around the site by driving everywhere resulting in soil compaction. -Effectively stabilise altered landforms to minimise soil erosion.	-No proliferation of informal vehicle tracks. -No new erosion gullies.	-ECO	Throughout the project phase
Soils and water resources	Soils and water resources pollution	-Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching water resources bodies. -All project employees should be sensitized about the impacts of soil pollution and advised to follow appropriate fuel handling procedures. -Develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible. -Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training.	-No complaints of pollutants on the soils and eventually in the water due to project activities -No visible oil spills on the ground or pollution spots. -Complaint's logbook -Availability of sufficient waste containers -Non-permeable material to cover the ground surface at areas where hydrocarbons	-Exploration & Mining Manager -ECO	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated on site. -Polluted soil should be removed immediately and put in a designate waste type container for later disposal. -Drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills along the tank trailer path/route around the project activity sites are cleaned on time (soon after the spill has happened). -Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility. -Washing of equipment contaminated hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources. -Toilet water should be treated using chemical portable toilets and periodically emptied out before reaching capacity and transported to a wastewater treatment facility.	and potential pollutants are utilized.		
Biodiversity	Loss of Fauna and Flora	**<u>Fauna (animals)</u>** -Refrain from disturbing, snaring, killing or stealing livestock on and around farms. -Avoid the killing of small soil and rock outcrops' species found on site. -Exploration and mining trenches and boreholes should be secured (temporary fencing) and backfilled and capped after sampling is completed to prevent injuries to animals after falling in. -Incorporate Environmental awareness and biodiversity preservation into the employment contracts of all workers.	-No disturbance to unmarked areas. -No complaints from locals regarding unauthorised vegetation removal or cutting down of trees. -No complaints of wildlife hunted by the project workers. -No intentional disturbance and destruction of site	-ECO	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Breeding sites for faunal species that are found within the site and nearby should not be disturbed. **<u>Flora (vegetation):</u>** -Avoid unnecessary removal of onsite vegetation, thus, promoting a balance between biodiversity and the project. -Vegetation found on the site, but not in the targeted exploration site areas or access route should be left undisturbed/avoided. -Vehicle movement should be restricted to existing roads and tracks to prevent unnecessary damage to the surrounding vegetation. -No onsite vegetation should be cut or used for firewood. -Access roads should be created in a manner that disturbs minimal vegetation. -Environmental awareness on faunal and floral biodiversity preservation should be provided to the workers and contractors. This should be incorporated into the workers' contracts.	vegetation and faunal species -Barricading tape (to indicate working areas) -Visible preservation of onsite vegetation		
Illegal hunting	Illegal hunting of wildlife	-The Poaching (illegal hunting) or disturbance/harming of wildlife on the farms and surrounding areas is strictly prohibited. -A No tolerance to Poaching Policy should be developed and apply to all site personnel (workers) and visitors. -Incorporate a No-tolerance rule for poaching in every employment contract and ensure that the workers understand the seriousness of this. In other words, there is no tolerance for poaching or to wildlife crime.	-There are no incident reports of illegal hunting of wildlife by the crew. -Contact details of the Anti-poaching Police Unit provided and visible onsite	-Exploration & Mining Manager -ECO	During site set up, and throughout the project phases
Land Use	Conflict between land uses and exploration activities	-The project and its associated activities should not in any way hinder the existing land uses but rather promote co-existence throughout the project operations while respecting other land users.	-Land access and use consents with clear conditions -Compliance with conditions set within operational	-Exploration & Mining Manager -PRO	Throughout the project phase

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-The project workers and vehicles should be limited to the actual MCs' sites only but not unnecessarily wander and drive around farm, respectively. -Ensure that the project activities comply with the conditions set by the competent, regulatory, and affected landowners such that the proposed activities do not severely impact the different existing activities and around the mining claims.	permits by relevant and affected landowner. -Little to no complaints of significant interference from land users/owners		
Visual (aesthetic)	The scarring of landscape and presence of project vehicles and machinery may impact the scenic view of the area for tourism and travellers on the roads.	-The exploration activities should be done away from the roads, and explored sites rehabilitated as far as possible. -Exploration activities that are likely to leave visible scars on the hills or mountains should be done on areas behind these mountains and not on the areas that are visible from the road. -Minimize the land scarring by targeting specific areas only. -The campsite (if onsite) should be established behind outcrops or thick vegetation where possible to limit their obvious presence to road users (tourists and travellers alike).	-No complaints of visual nuisance from the travellers or farmers. -No disturbed sites areas are left without rehabilitation -Project activities are limited to areas far from the roads.	-Exploration & Mining Manager	Throughout the project phases
Road use and safety	Increase in vehicular traffic flow	-Project related goods and services should be delivered to site once to twice a week to reduce the daily movement of trucks and putting too much pressure on local roads. -If additional access roads (tracks) are required, the respective farmer/landowner should be consulted before creating new tracks to give consent and or guidance. -Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses and adhere to the road safety rules. -Drivers should drive slowly (40km/hour or less) and be on the lookout for livestock and wildlife. -Ensure that the site access roads are well equipped with temporary road signs.	-No complaints from the public or farmers regarding vehicular traffic issues related to the project activities. -All personnel operating the project vehicles and machinery are appropriately licensed and possession of valid driving licenses. -Demarcated areas for parking, offloading, and loading zones are on sites.	-Exploration Manager -ECO	Throughout the project phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents owing to mechanical faults. -Vehicle drivers should only make use of designated site access roads provided and as agreed. -Vehicle drivers should not be allowed to operate vehicles while under the influence of alcohol. -Project vehicles should be parked within the boundary or demarcated areas for such purpose. -Deliveries from and to site should be done optimally during weekdays and between the hours of 8am and 5pm. -The site access road(s) should be maintained to an unacceptable standard for the vehicles.	-No creation of unnecessary tracks on site.		
Local roads	Overuse and maintenance	-Heavy trucks transporting materials and services to site should be scheduled to travel twice a week to avoid daily travelling to site, unless on cases of emergencies. -Consider frequent maintenance of local roads on the farms to ensure that the roads are in a good condition for other roads users such as farmers, and travellers from and outside the area.	-Visible efforts of maintaining access and community roads by the Proponent	-Proponent -Exploration & Mining Manager	Throughout the project phases, when necessary
Occupational and Community Health and safety	General health and safety associated with project activities in both phases	-During inductions, provide project workers with an awareness training of the risks of mishandling equipment and materials on site and health & safety risk associated with their respective jobs. -Project workers should be properly equipped with adequate and appropriate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. -All workers should be dewormed before commencing with exploration and mining activities. This should be repeated as prescribed.	-Comprehensive health and safety plan for all project activities compiled. -Quarterly refresher training on health & safety -Occupational Health and Safety Personnel Health and Safety Trainings -Availability of fully-furnished first aid kits -Trained worker to administer first aid	-Proponent -Exploration & Mining Manager -ECO	Throughout the project phases and trainings offered as and when required

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible. -Drilled holes that will no longer be in use or to be used later after being drilled should be properly marked for visibility and capped/closed off. -Trenches should be temporarily fenced off during sampling, and once completed, they should be backfilled thereafter -Drill cuttings and excavated materials should be put back into the hole and the holes filled and levelled, and trenches backfilled respectively. -An emergency preparedness plan should be compiled, and all personnel appropriately trained. -Workers should not be allowed to enter the working sites when under the influence of alcohol as this may lead to mishandling of equipment which results into injuries and other health and safety risks. -Ensure that goods and projected loads are securely fastened to vehicles to avoid falling and injure people. -Warning signage should be erected at hazardous site areas such as open trenches. -The site areas that are considered temporary risks should be equipped with "danger" or "cautionary" signs clearly written in the local languages, i.e., Afrikaans and English.			

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
	Potential increase of prevalence of HIV and AIDS, as well as other sexually transmitted diseases (STDs) prevalence	-Engage workers in sexual health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. -Provision of condoms and sex education through distribution of pamphlets and health trainings. These pamphlets can be obtained from the nearest local health facility in Karibib.	-No new infections recorded linked to project workers -Occupational health and safety personnel -Sex and Health Education/Awareness -Provision of condoms at the campsite	-Exploration & Mining Manager -ECO	Throughout the project phases
	Accidental fire outbreak	-Portable and serviced fire extinguishers should be provided at site and camp. -No open fires to be created onsite. -Consider using gas or paraffin cooks to prepare food instead of open fires. The cooks/stoves fire should be put out before leaving the camp (if the camp is established onsite/at the farms). -Make provision for smoking areas for crew members who smoke. This is to ensure that the cigarettes' fire is completely put out to and disposed of in allocated bins at the smoking area. -Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage. -Raise awareness to workers on the impact of careless handing of fires and flammable substances in the fire.	-No wildfires recorded (due to presence of workers) -Fire extinguishers (1 per vehicle) and 1 per working site	-Proponent -ECO	Throughout the project phases
Archaeology and heritage	Accidental disturbance of archaeological or heritage objects	-If any archaeological material or human burials are uncovered during development activities, then work in the immediate area should be halted, the find would need to be reported to the heritage authorities and may require inspection by an archaeologist. -Buffer zones should be maintained around known significant archaeological, historical or cultural heritage sites as far as possible. Graves, caves, rock shelters, stratigraphic profiles and	-Preservation of all artefacts and objects that are discovered on and around project site -Salvage equipment -Archaeologist to recommend further actions -Flag tapes	-Exploration & Mining Manager -ECO -Operator (Driller or Excavating personnel)	As and when required, i.e., prior to site set up, and during the project phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		areas with cultural significance are excluded from any development. -A "No-Go-Area" should be put in place where there is evidence of sub-surface archaeological materials, archaeological sites, gravesites, historical, rock paintings, cave/rock shelters or past human dwellings. It can be a demarcation by fencing off or avoiding the site completely by not working closely or near the known site. The 'No-Go Option' might have a NEUTRAL impact significance. -If there is a possibility of encountering or unearthing archaeological materials then it is better to change the layout design to avoid the destruction that can occur. -Direct damage to archaeological or heritage sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued. -Cognizance must be taken of the larger historical landscape of the area to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage or archaeological resources be exposed or uncovered during the development phases of the proposed project, these should immediately be reported to the heritage specialist or heritage authority (NHC of Namibia). -The Proponent and Contractors should adhere to the provisions of Section 55 of the National Heritage Act in the event significant heritage and cultural features are discovered in the course of developmental works. -During exploration and mining works, it is important to take note and recognize any significant material being unearthed and making the correct judgment on which actions should be taken (refer to CFP Appendix A attached to the EMP).	-GPS (site marking)		

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-The footprint impact of the proposed activities should be kept to minimal to limit the possibility of encountering chance finds within the boundaries of the MCs. -For removal of topsoil and subsoil on the site for exploration and mining purposes, the site should be monitored for subsurface archaeological materials by a qualified Archaeologist.			
Littering and waste management (general waste and sanitation)	Environmental Pollution	-Workers should be sensitized to dispose of waste in a responsible manner and not to litter. -Dispose of waste in a responsible manner and not to litter. -After each daily works, ensure that there are no wastes left on the working sites or scattered around the camp. -All domestic and general operational waste produced daily should be contained onsite until such that time it will be transported to designated waste sites. -No waste may be buried or burned on site or anywhere else. -The working sites should be equipped with separate waste bins for hazardous and general/domestic waste. -Oil spills should be taken care of by removing and treating soils affected by the spill. -A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented. -Ensure careful storage and handling of hydrocarbons on site is essential. -An emergency plan should be available for major/minor spills at the site during operation activities.	-No visible litter around the project area -Provision of sufficient waste storage containers -Waste management awareness -Waste disposal permits to municipalities -Environmental, Health and Safety Statements and Policy	-ECO -Exploration & Mining Manager	Throughout the project phases
	Wastewater generated by workers living on-site.	-Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with	-Adequate toilet and basic ablution facilities on site -Chemical toilets	-Exploration & Mining Manager -ECO	Throughout the project phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		municipal wastewater discharge standards so that they do not contaminate surrounding soils and eventually groundwater. -No open defecation is allowed on and around the site. -Sewage waste should be stored as per the portable chemical toilets supplied on site and regularly disposed of at the nearest treatment facility -Provide sufficient toilet facilities for workers (mobile/portable chemical toilet if possible). -Emptying of chemical toilets according to the manufacturer's specifications.	Sewage removal operator -Waste treatment agents/chemicals.		
Air Quality	Dust generation	-Project vehicles within the area should not be driven at a speed more than 40 km/h to avoid dust generation. -A reasonable amount of water should be used on gravel roads, using regular water sprays on gravel routes and near problematic working sites to suppress the dust that may be emanating from certain project site areas. -Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) such as face masks should be provided to the workers on site drilling areas, where they are exposed to dust. -Excavating equipment should be regularly maintained to ensure drilling and excavation efficiency and so to reduce dust generation and harmful gaseous emissions.	-No complaints from the public about vehicle emissions and dust generation. -Visible efforts to curb dust -Complaint's logbook -Dust suppressant (Water)	-Exploration & Mining Manager -ECO	Throughout the project phases
Noise	Nuisance	-Noise from operations' vehicles and equipment on the sites should be at acceptable levels. -Working hours should be restricted to between 07h30 and 17h00 to avoid noise and vibrations generated by project equipment and the movement of vehicles before or after hours.	-No complaints of excessive noise from farmers -Complaint's logbook	Exploration & Mining Manager -ECO	Throughout the project phases

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-No noise making activities such as drilling should take place within 1km of the farmhouse. -When operating the drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce exposure to excessive noise.	Noise protective equipment for workers		
Social nuisance	Local properties disturbance and values	-Inform the project workers and contractors of the importance of respecting the farmers' properties by not trespassing or injuring / killing their livestock and wildlife. -Any worker or contractor found guilty of trespassing should be called in for disciplinary hearing and/or dealt with as per their employer' (Proponent)'s code of employment conduct. -The workers/contractors should be advised to respect the local's private properties, values, and norms. -No worker should be allowed to wander in people's private yards or fences (no-go areas) without permission. -The cutting down or damaging of vegetation belonging to the hosting farm or neighbouring farms, without the landowners' permission is strictly prohibited.	-No complaints from farmers about property theft, disturbance, or intrusion -Grievance / complaint logbook -Land access agreement conditions	-Exploration & Mining Manager -ECO	Throughout the project phases

Table 5-2: The Mitigation measures for site rehabilitation during exploration and mining

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
Progressive Rehabilitation and Decommissioning Phase					
Rehabilitation	Disturbance and damaging of land site land	-All drilled boreholes and excavated pits related to the project activities should be capped and backfilled, respectively.	-Capped boreholes and backfilled pits	-Proponent -Exploration & Mining Manager	Progressive rehabilitation done throughout the exploration and mining

Aspect	Impact	Management and Mitigation Measure(s)	Key Performance Indicator (KPI)	Implementation Responsibility	Timeline
		-All waste generated and stored on site during exploration and mining activities should be disposed of at the respective nearest solid waste management sites. -The stockpiled topsoil should be levelled soon after completion of works at sites. -Any temporary setup on site should be dismantled, and the area rehabilitated as far as practicable, to their original state. -Explored and mined areas on worksites should be progressively rehabilitated by stockpiling and backfilling. -Provision of both financial and technical resources for progressive rehabilitation. -Respective farmers should be consulted to approve and sign off Site Rehabilitation Completion to their satisfaction	-Excavators and other backfilling/demolishing machinery -No sign of waste or littering seen on site and around site areas. -Carrying away of waste, and removal of vehicles and equipment from site -No stockpiled topsoil (topsoil is levelled after completion of each work) -Campsite dismantled, site levelled and materials taken away from site. -Visible signs of stockpiled topsoil -Record of trenches excavated, and boreholes drilled -Waste containers on sites -Photo records of backfilled sites -Records of finances set aside for decommissioning activities		phases and complete decommission and rehabilitation done after completion of exploration and mining works.

5.3 Environmental Monitoring Actions

To ensure that the implementation of recommended environmental management measures is working and produces the desired results (minimizing the "medium" and uphold the "low" significance ratings of impacts), certain key impacts will need to be monitored and reported on. The environmental aspects to be monitored are shown in Table 5-3. The ‘’*Observation, compliance status and ‘’Recommended Action*’’ columns will be completed for every monitoring done on site.

Monitoring reports are to be compiled by the project ECO, audited by an Independent Environmental Consultant, and submitted to the DEAF for archiving on a bi-annual basis (every 6 months throughout the project operations) or as required by the Environmental Commissioner (as per the ECC conditions). The environmental components or features provided in the Table will be updated accordingly once the project commences.

Table 5-3: Monitoring of Biophysical and Social Aspects referred to in the assessment (modified after Resilient Environmental Solutions, 2019)

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Water and soil pollution									
Soil pollution by hydrocarbon (fuel and lubricant spills)	Complaints from farmers within the project sites	To prevent contamination of site soils	No complaints from landowners or public about visible oil spills	Inspection of complaints logbooks	Weekly	ECO	ECO-> Exploration & Mining Manager	A logged complaint	Further consultations with the landowners and or communities
Wastewater generated by exploration workers living on-site.	Open defecation and urination.	To prevent environmental pollution	Adequate toilet facilities on site. Complaints from the farmers about open defecation.	Visual observation. Inspection of complaints logbook.	Weekly	ECO	ECO-> Exploration & Mining Manager	A logged complaint	Clean-up of affected areas.
Soils									

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Loss of topsoil	Increased loss of soil	To prevent loss of topsoil	No proliferation of informal vehicle tracks. No new erosion gullies	Visual observation	Weekly	ECO	ECO-> Exploration & Mining Manager	Proliferation of new vehicle tracks Formation of new gullies in work areas	Rehabilitation of affected explored areas
Air quality (Dust)									
Increase in dust generation, which might negatively affect occupational and residential respiratory health.	Complaints from public about increased in dust generation.	To reduce public complaints and prevent negative changes in air quality due to exploration activities	No complaints from the public about increased dust generation.	Inspection of complaints logbook.	Weekly	ECO	ECO-> Exploration & Mining Manager	A logged complaint	Dust suppression around working areas to reduce fugitive dust
Hydrocarbon emissions from vehicles	Complaints from the public about increased vehicles fumes	Same as above.	No complaints from the public about increased vehicle emissions	Inspection of complaints logbook.	Weekly	ECO	ECO-> Exploration & Mining Manager	A logged complaint	Servicing of vehicles and machinery by a certified service provider
Poaching (Illegal hunting)									
Illegal hunting of wildlife	Reported poaching	To prevent illegal hunting of wildlife	Incidents reports of illegal hunting	Consultation with the local Police	Weekly	ECO	ECO-> Exploration & Mining Manager > local Police Service (Anti-poaching Unit)	An incidents report	Appropriate action will be decided by the

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
	incidents by projects team		of wildlife by exploration workers.	Service for reported incidents of poaching.				logged with the local Police Service	local Police Service
Habitat loss (Biodiversity)									
Localised loss of habitat and vegetation	Loss of habitat	To prevent loss of habitat outside areas of interest	No disturbance to unmarked areas within the project area	Visual observation	Weekly	ECO	ECO -> Exploration & Mining Manager	Vegetation clearance outside of marked areas.	Rehabilitation of affected areas to the satisfaction of the ECO
Occupational and Public Health and Safety									
No health and safety plan for exploration activities.	Compiled health and safety plan for exploration activities.	To prevent health and safety impacts	No significant health and safety incidents (i.e., serious injuries or loss of life)	Visual observation Inspection of complaints logbooks	Daily/ weekly	ECO and Exploration Manager	ECO-> Exploration & Mining Manager	Health and safety incident	Remedy the consequences
Potential increase in outbreak of wildfires due to project activities	Occurrence of wildfires	To prevent environment damage caused by wildfires	No wildfires recorded (due to presence of exploration workers)	Visual observation	Daily	ECO	ECO -> Exploration & Mining Manager -> local Police Service	Outbreak of wildfires due to the exploration workers	Rehabilitation of affected areas
Archaeology and cultural heritage									
Potential disturbance of archaeologic	Presence or unearthing of archaeologic al or cultural	To prevent destruction of artefacts and sites	Preservation of all artefacts and sites that are	Inspection of records of findings	Daily	ECO	Operator->Foreman-> Superintended->ECO- >Project Archaeologist ->	Unearthing of archaeologi cal or	Cease all activities on site and wait for NHC to

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
al and cultural heritage resources	heritage resources		discovered within the site boundary or around the project site area			Operator / Contractor	National Heritage Council (NHC)	cultural heritage resources	inspect site and give further instructions / actions
Employment creation and Corporate Social Responsibility (CSR)									
Creation of employment, procurement of goods and services	Employment opportunities -Community projects support -Local / regional procurement	To ensure that locals benefit from the Project	Employment, community support and local and regional procurement	Inspection: employed, procurement & community project records	Monthly	Exploration Manager	Exploration & Mining Manager or Proponent	Number of CSR projects	Open communication and reasonable requests / proposals
Noise									
Potential increase in noise	Above ambient noise levels.	To ensure that generated noise does not disturb residents.	Complaints from residents about noise generated.	Inspection of complaints logbook	Weekly	ECO	ECO -> Exploration & Mining Manager	A logged complaint about above normal noise levels	Revision of site activities
Vehicular Traffic									
Increase in traffic density on declared Roads Authority (RA) roads or	Complaints from the public about increase in traffic on the roads.	To ensure continued ease of access to local roads by residents / communities	No complaints from the public about increase off traffic due to	Inspection of logbooks	Weekly	ECO	ECO -> Exploration & Mining Manager -> Roads Authority	A logged complaint about traffic increase or damage to RA roads	Find alternative access roads for the workforce. Rehabilitation of affected roads

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
damage to these.	Complaints about damage to RA roads caused by movement of project vehicles and machinery.		project activities						
HIV and AIDS									
Potential increase in HIV and AIDS prevalence.	New HIV or sexually transmitted infections (STIs)	To prevent new infections in the area	No new HIV or STIs infections recorded	Liaison with local health facilities	Monthly	ECO	ECO -> Exploration & Mining Manager -> Ministry of Health and Social Services	Recorded new HIV or STIs linked to project workers	Continued sex education and provision of condoms
Environmental Pollution (Littering)									
Environmental pollution from solid waste during project activities.	Scattered litter	To prevent littering of the general project area	No visible litter around the project area	Visual observation	Daily	ECO	ECO -> Exploration & Mining Manager	Visible littering around project site	Clean-up of the affected areas and ensuring workers utilise waste containers provided.
Visual									
Visual impact owing to the project's project activities	Contrasting landscape (eyesore to travellers on the local roads	To prevent and or reduce the appearance of contrasting land scars	Reduction of and minor contrasting landscape in the project site areas	Visual observation	Weekly	ECO	ECO -> Exploration & Mining Manager	Major and very visible contrasting land scars on the site areas	Effective implementation of provided measures and continual improvements.

Impact	Parameter to be Monitored	Monitoring Objective	Key Performance Indicator (KPI)	Methods of Monitoring	Frequency	Responsible Party	Reporting structure	Threshold	Action if threshold is exceeded
Site Rehabilitation									
Soil and land disturbance because of project activities.	Stockpiled topsoil and very disturbed site areas	To prevent major soil / land damage by project activities	No major soil and land disturbance	Visual observation	Daily	ECO	ECO -> Exploration & Mining Manager	Visible soil and land disturbance	Effective progressive levelling of topsoil and backfilling of pits / holes

5.4 Rehabilitation and Decommissioning Measures: Post-Mining Activities

Rehabilitation is a costly process, and opportunities to repeat unsuccessful rehabilitation works are often limited, so it is important that work consistently achieves acceptable outcomes. To be successful, rehabilitation programs must follow a number of steps[1] as shown in Figure 5-1 below.

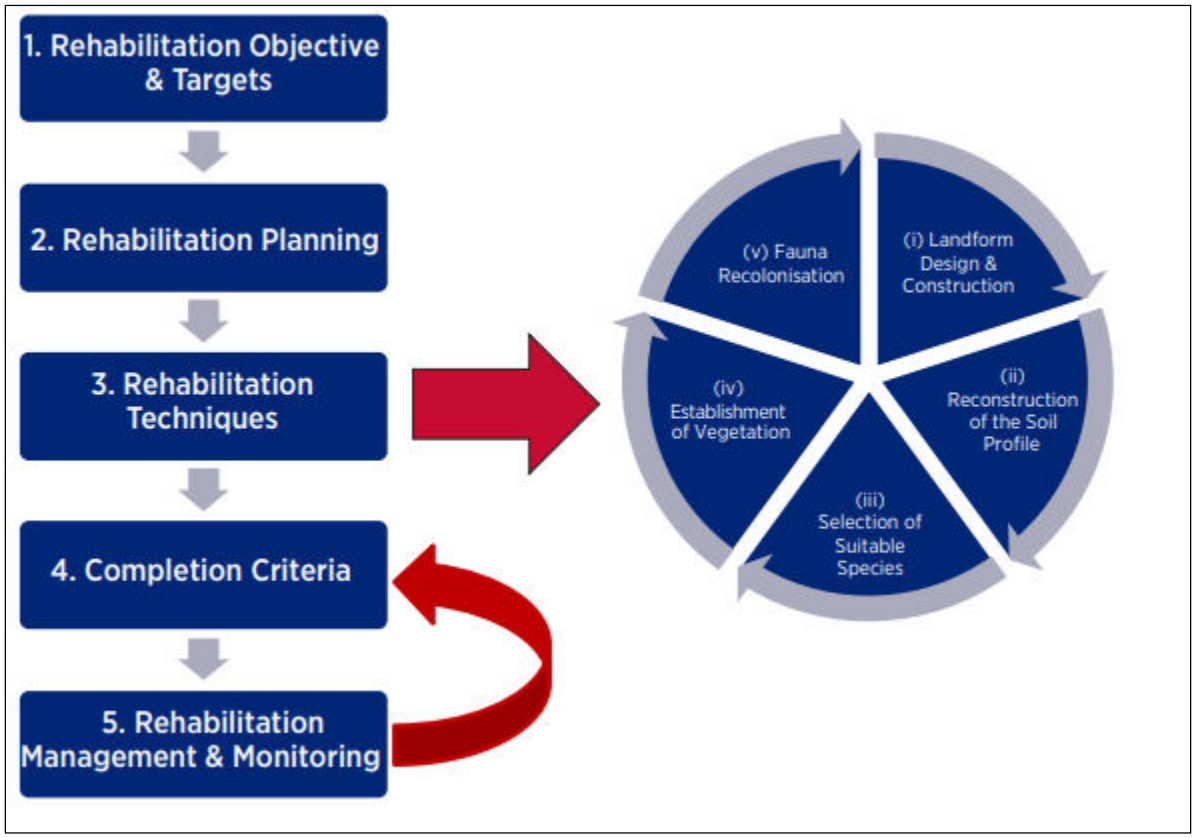

Figure 5-1: Stages of rehabilitation planning and implementation (Australian Government, 2016)

The scale and type of mining impacts together with local environmental factors, affect a mine site's ability to achieve its rehabilitation targets and objectives.

It should be noted that rehabilitation of a mine after cessation of activities does not just happen right after mining has stopped, but it is a progressive exercise that needs planning, implementation and monitoring over time. Therefore, a Mine Closure Framework will need to be developed (once mining activities start) and regularly updated throughout the mine life.

[1] Australian Government. (2016): Mine Rehabilitation: Leading Practice Sustainable Development Program for the Mining Industry. https://www.industry.gov.au/sites/default/files/2019-04/lpsdp-mine-rehabilitation-handbook-english.pdf

Surface mining may be a bit challenging compared to underground mining because the footprint of actual mining can be felt by and is visible to surrounding communities. The management measures to be implemented (for rehabilitation) after the cessation of mining activities onsite are provided in Table 5-4 below.

Ndawanenwa Mineral Exploration is solely responsible for the rehabilitation of the site and its associated infrastructure, as deemed necessary.

Table 5-4: Rehabilitation Measures for Post-Mining Activities

Aspect	Management and Mitigation Measure(s)	Implementation Responsibility	Timeline
Mine and associated services and structures			
Finance and technical resources: Lack of funds and technical planning for closure	-Provision of both financial and technical resources for progressive rehabilitation and post-mining activities should be made. -Develop a Mine Closure Framework and update regularly throughout the mining phase.	Ndawanenwa Mineral Exploration	Throughout the project cycle
Above Ground Openings (quarry, diversion ditches)	-Place topsoil over the backfilled area. -Shape footprint area to be free-draining (aligned to site-wide routing). -Rip area to alleviate compaction -Establish vegetation.	Ndawanenwa Mineral Exploration	Post-mining / upon closure
Quarry (open pit)	-The stockpiled topsoil and waste rocks should be used to backfill the mined areas. Since, surface quarries (open pits) are near impossible to close up completely, the quarries can be used for the following after-use. In other words, the possible after-use options that could be	Ndawanenwa Mineral Exploration	

Aspect	Management and Mitigation Measure(s)	Implementation Responsibility	Timeline
	considered for post-mining use of the quarry upon successful rehabilitation or at least until it is made safe for such use(s). -Research and education: geological (excursion or education) sites, nature preservation areas, training courses for rescue dogs and rescue personnel, xerothermic areas, and other science use (e.g., astronomy). -Culture: open-air theatres, museums, quarrying heritage, art (sculptures, lighting, painting, rock art, film sets -Recreational activities: parks (recreational areas, build environments), places to swim (summer/winter), paddling, sailing, skating, fishing, leisure house area -Rock building: housing and storage -Storage: water storage, cold storage of timber and landfills -Forestry: natural and planted **The Proponent can also consult the farm owner on how best they can rehabilitate the sites for future use of the farm.**		
Electrical cables	-The power supply cables installed for the project should be carefully dismantled and transported for appropriate storage at designated facilities offsite.	Ndawanenwa Mineral Exploration	Post-mining / upon closure
Water supply systems	-The water supply pipelines and tanks should be disconnected for transportation for storage at appropriate storage facilities offsite.	Ndawanenwa Mineral Exploration	Post-mining / upon closure
Solid waste and sewage	-All waste created leading to the last day of mining should contained for disposal at the nearest respective waste management and treatment facilities.	Ndawanenwa Mineral Exploration	Post-mining / upon closure

Aspect	Management and Mitigation Measure(s)	Implementation Responsibility	Timeline
	-Sort and screen waste produced from the dismantling and demolition of infrastructure. -Crush decontaminated concrete, if required. -Recycle waste that can be recycled/salvaged (e.g., steel) after decontamination.		
Used and unused oil and fuels (hazardous waste) storage tanks	-Fuel storage tanks should be carefully dismantled (avoid spills). -Remove oil drums and petroleum products off site for resale/use. -Demolish the storage area and associated tanks in which petroleum products are stored. -Decontaminate at dedicated decontamination bay in at any nearby capable waste facility such as in Windhoek. -Un-reusable/hazardous services and infrastructure should be disposed of at the hazardous waste management facility, preferably in Windhoek.	Ndawanenwa Mineral Exploration	Post-mining / upon closure
Contaminated soils	-Undertake a site-wide contaminated soil to determine the nature and extent of contamination, the sources of contamination and to identify appropriate remediation measures. -Rehabilitate moderately contaminated (inorganically contaminated) soils as follows: • Excavate contaminated material to a depth of 300 mm and remove and dispose of at the Arandis landfill site or any nearest capable and approved waste management facility. -Rehabilitate moderately contaminated (organically contaminated) soils as follows:	Ndawanenwa Mineral Exploration	Post-mining / upon closure

Aspect	Management and Mitigation Measure(s)	Implementation Responsibility	Timeline
	• Treat organic contamination by means of biological remediation via the establishment of a bioremediation site and monitor soil quality against a selected control site.		
Surface infrastructures: buildings (offices) and services	<u>Infrastructure for Potential Beneficial re-use</u> -Compile an inventory of infrastructure and equipment to potentially remain at closure, aligning to end land use plan. -Obtain legal authorisations for infrastructure to remain and be transferred, and finalise agreements with third parties, along with transfer schedule. <u>Service infrastructure to be removed</u> -Remove all equipment that can be profitably removed for salvage or resale. -Dismantle/demolish infrastructures such as offices, tanks, ablution container; water storage container/tank. -Decontaminate hazardous waste storage tanks and containers at a dedicated decontamination bay in the nearest town with capable facilities. -Demolish and excavate concrete foundations to 1m below ground level. In appropriate instances the concrete slabs of “clean” infrastructure can be covered with a 1,000mm soil cover to re-profile and integrated into the surrounding topography. -Backfill excavations of disturbed infrastructure footprint areas through a cut to fill action.	Ndawanenwa Mineral Exploration	Post-mining Progressively after closure

Aspect	Management and Mitigation Measure(s)	Implementation Responsibility	Timeline
	-Shape and profile the disturbed areas to match surrounding topography and to ensure free drainage (to limit run-off erosion). -With the help of a Botanist, establish vegetation species that mimic the surrounding flora by collecting seed from pristine bush and shrub land and actively planting before the wet season. <u>Measures relating to transport Infrastructure</u> -Agreements should be put in place between the Proponent, affected farmer for some roads to remain post closure for beneficial use by the farmer and potential locals. -Roads that will no longer be used by locals post-closure will be closed off to avoid re-creation of tracks over such areas, re-establish natural drainage, including the removal of culverts and/or trenching, and profile to be free draining and emulating the surface topography.		

Appendix 1: Chance Finds Procedure (CFP) After Kinahan, 2020

Areas of proposed activities are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is therefore possible that sites or items of heritage significance will be found during development work. The procedure set out here covers the reporting and management of such finds.

Scope: The "*chance finds*" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified person.

Compliance: The "chance finds" procedure is intended to ensure compliance with relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): "*a person who discovers any archaeological …. object ……must as soon as practicable report the discovery to the Council*". The procedure of reporting set out below must be observed so that heritage remains reported to the NHC are correctly identified in the field.

Manager/Supervisor must report the finding to the following competent authorities:

- **National Heritage Council (NHC) of Namibia: +264 61 244 375**
- **NHC of Namibia (Technical Office): +264 61 301 903**
- **National Museum: +264 61 276 800**
- **National Forensic Laboratory: +264 61 240 461.**

Archaeological material must NOT be touched. Tempering with the materials is an offence under the Heritage act and punishable upon conviction by the law.

Responsibility:

Operator: To exercise due caution if archaeological remains are found

Foreman: To secure site and advise management timeously

Superintendent: To determine safe working boundary and request inspection

Archaeologist: To inspect, identify, advise management, and recover remains

Procedure:

Action by person identifying archaeological or heritage material:

a) If operating machinery or equipment stop work

b) Identify the site with flag tape

c) Determine GPS position if possible

d) Report findings to foreman

Action by foreman

a) Report findings, site location and actions taken to superintendent

b) Cease any works in immediate vicinity

Action by superintendent

a) Visit site and determine whether work can proceed without damage to findings

b) Determine and mark exclusion boundary

c) Site location and details to be added to project GIS for field confirmation by archaeologist

Action by Archaeologist

a) Inspect site and confirm addition to project GIS

b) Advise NHC and request written permission to remove findings from work area

c) Recovery, packaging and labelling of findings for transfer to National Museum

In the event of discovering human remains

a) Actions as above

b) Field inspection by archaeologist to confirm that remains are human

c) Advise and liaise with NHC and Police

d) Recovery of remains and removal to National Museum or National Forensic Laboratory, as directed.