

**Draft Environmental Management Plan (EMP):**

**The Proposed Exploration of Dimension Stone on Exclusive Prospecting License (EPL) 7008 near Karibib in the Erongo Region**


**Proponent: Naris Mineral Resources CC**

**Date: 07 December 2020**

## DOCUMENT INFORMATION

**DOCUMENT TITLE: ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE PROPOSED EXPLORATION ACTIVITIES OF DIMENSION STONE ON EXCLUSIVE PROSPECTING LICENSE (EPL) 7008 NEAR KARIBIB IN THE ERONGO REGION, NAMIBIA**

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## TABLE OF CONTENTS

<b>TABLE OF CONTENTS</b> .....	ii
<b>LIST OF FIGURES</b> .....	iii
<b>LIST OF TABLES</b> .....	iii
<b>LIST OF APPENDICES</b> .....	iii
<b>LIST OF ABBREVIATIONS AND MEANINGS</b> .....	iii
<b>1 INTRODUCTION</b> .....	1
1.1 Brief Project Background and Location .....	1
1.2 EPL 7008 Ownership .....	3
1.3 Purpose of the Environmental Management Plan (EMP) .....	4
1.4 The Environmental Consultant .....	5
1.5 Limitations of the Draft Environmental Management Plan (EMP) .....	5
<b>2 BRIEF PROJECT DESCRIPTION, ACTIVITIES AND PROCESSES</b> .....	6
2.1 Project Inputs .....	6
2.2 Planned Activities: Exploration Methods .....	8
2.2.1 Desktop Study .....	8
2.2.2 Field Evaluation .....	8
2.2.3 Detailed Exploration .....	9
2.2.4 Feasibility Study: Test Quarrying (Exploration Component) .....	9
2.3 Rehabilitation of explored Sites and Decommissioning .....	10
<b>3 EMP IMPLEMENTATION AND RESPONSIBILITIES</b> .....	10
3.1 The Exploration Manager (or the Proponent) .....	10
3.2 Safety, Health and Environmental (SHE) Officer .....	11
3.3 Public Relation Officer (PRO) .....	11
3.4 Archaeology: Chance Finds Procedure (CFP) Implementation Roles .....	11
3.4.1 Operator .....	11
3.4.2 Foreman .....	11
3.4.3 Superintendent .....	11
3.4.4 Archaeologist .....	11
<b>4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ACTIONS</b> .....	12
4.1 Applicable Legislation: Authorisation (Permits and Licenses) .....	12
4.2 Planning, Exploration and Decommissioning Phases .....	14
4.3 Monitoring of EMP Implementation .....	40
<b>5 RECOMMENDATIONS AND CONCLUSIONS</b> .....	47

## **LIST OF FIGURES**

Figure 1:	Locality map of EPL 7008 about 15 km south of Karibib in the Erongo Region .....	2
Figure 2:	Location of EPL 7008 on Farm Habis 71 .....	2
Figure 3:	EPL 7008 on the Portal (source: <a href="https://portals.landfolio.com/namibia/">https://portals.landfolio.com/namibia/</a> ) .....	3
Figure 4:	A typical example of a Down-The-Hole drill rig.....	9

## **LIST OF TABLES**

Table 1:	Approximate GPS Coordinates of EPL 7008 .....	3
Table 2:	Applicable legislations in terms of permits or licenses for the proposed exploration activities	12
Table 3:	Management Plan Actions for the Planning, Exploration, and Decommissioning Phases	15
Table 4:	Monitoring requirements for impact mitigation measures (update after Resilient Environmental Solutions, 2019) .....	41

## **LIST OF APPENDICES**

**Appendix 1:** Chance Finds Procedure (Archaeological and Heritage Management)

## **LIST OF ABBREVIATIONS AND MEANINGS**

<b>CC</b>	Close Corporation
<b>CFP</b>	Chance Finds Procedure
<b>COVID-19:</b>	Coronavirus disease (COVID-19) an infectious disease caused by a newly discovered coronavirus.
<b>DEAF</b>	Department of Environmental Affairs and Forestry
<b>DTH:</b>	Down-The-Hole drilling
<b>EA</b>	Environmental Assessment
<b>ECC</b>	Environmental Clearance Certificate
<b>EIA</b>	Environmental Impact Assessment
<b>EMA</b>	Environmental Management Act
<b>EMP</b>	Environmental Management Plan
<b>EPL</b>	Exclusive Prospecting License
<b>ESA</b>	Environmental Scoping Assessment

## **Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

<b>I&amp;APs</b>	Interested and Affected Parties
<b>MAWLR</b>	Ministry of Agriculture, Water & Land Reform
<b>MEFT</b>	Ministry of Environment, Forestry and Tourism
<b>MME</b>	Ministry of Mines and Energy
<b>MURD</b>	Ministry of Urban and Rural Development
<b>MWT:</b>	Ministry of Works and Transport
<b>NHC</b>	National Heritage Council of Namibia
<b>OGGC</b>	OMAVI Geotechnical and Geo-environmental Consultants cc

## 1 INTRODUCTION

### 1.1 Brief Project Background and Location

To fulfil their operation mission in exploration, Naris Mineral Resources CC (hereinafter referred to as the *Proponent*) a 100% Namibian-owned company proposes to undertake exploration on the Exclusive Prospecting License (EPL) 7008 in the Erongo Region. The EPL 7008 is located about 15 km south of Karibib and cover a surface area of area of 169 hectares (ha). The EPL overlies Farm Habis No. 71, with its western boundary within the borderline that separates Farm Habis 71 and Portion 1 of Farm Habis No. 71. The EPL is owned by the Proponent and the commodities that can be found on the EPL are dimension stone.

The project area is located within the southern Central Zone (sCZ) of the Neo-Proterozoic Damara Orogenic Belt, which is underlain by the Abbabis Metamorphic Complex (MAB) characterized by basement dome structures and antiforms, and it is unconformably overlain by the Damara Supergroup. The Damara Supergroup comprises mainly metasedimentary rocks deposited in the period from about 900 to 700 Ma (Miller, 1983a), with the lower part dominated by meta-arkoses and calc-silicate rocks of the Nosib Group, while the upper portion of the sequence consists of alternating marbles, calc-silicate rocks, and schists of the Swakop Group.

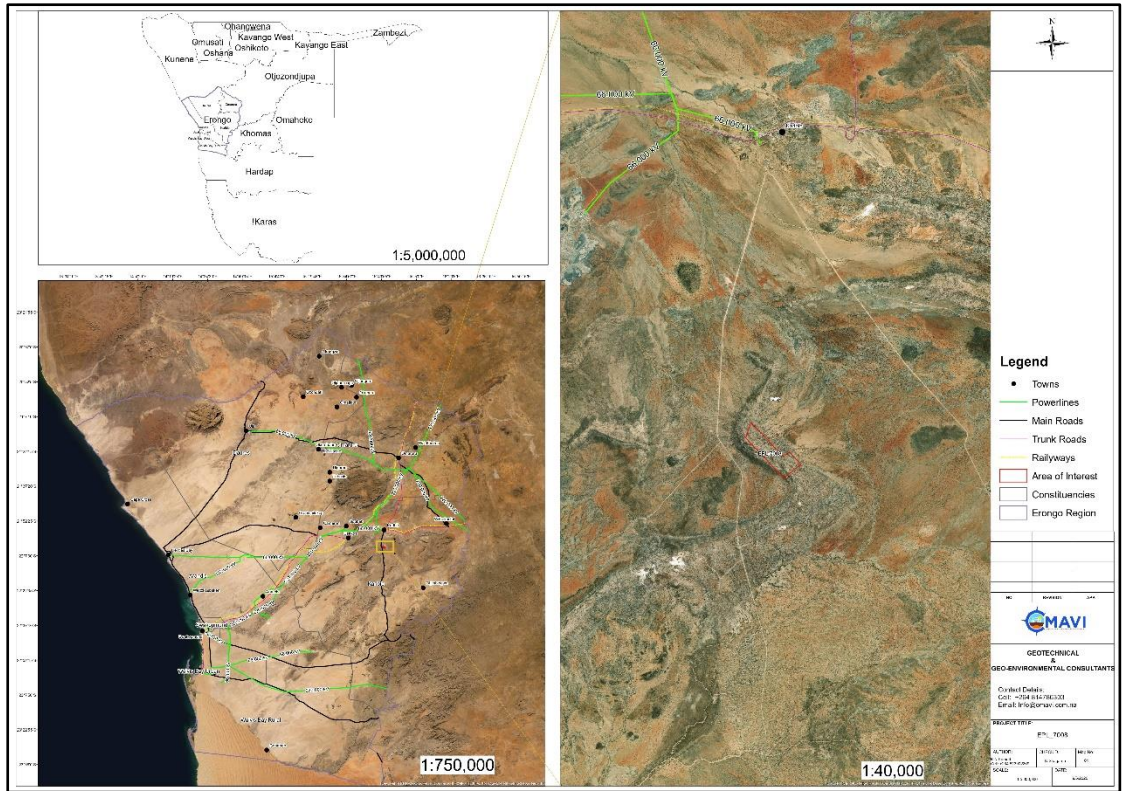
The bulk of the project area or EPL comprises meta-sedimentary rocks of the Swakop Group, primarily the Karibib Formation (marbles, dolostones and limestones) which are of interest to the proposed project (exploration activities). These rocks are surrounded by unconsolidated Quaternary sediments consisting mainly of alluvium (sand, calcrete and gravels), particularly in the low-lying areas.

**It should be noted that no mining activities are planned for nor will be part of the proposed activities and therefore it (mining) will not be discussed nor be part of the environmental scoping assessment (ESA).**

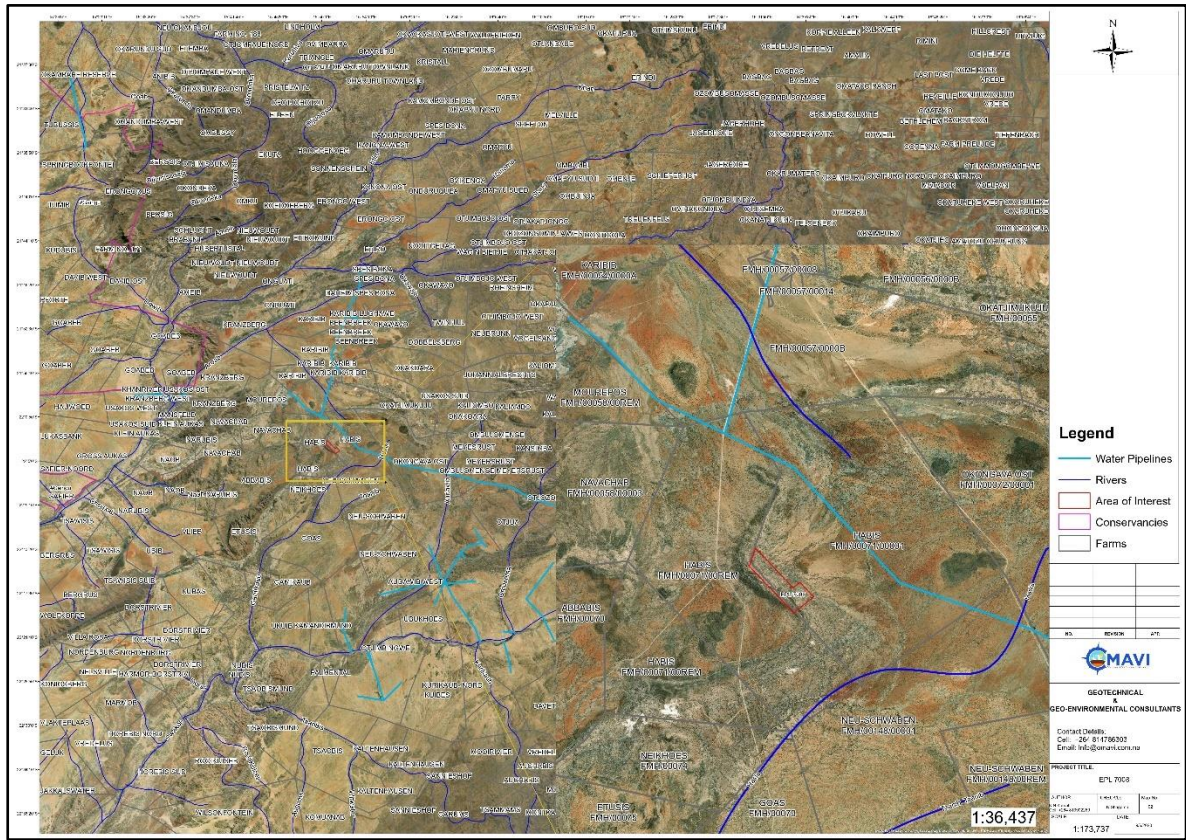
The locality map and the map showing EPL 7008 and the farms it overlies are shown in **Figure 1** and **Figure 2** below.



# Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region



**Figure 1: Locality map of EPL 7008 about 15 km south of Karibib in the Erongo Region**



**Figure 2: Location of EPL 7008 on Farm Habis 71**

Table 1: Approximate GPS Coordinates of EPL 7008

EPL 7008	GPS Coordinates boundaries
Point A	-22.056800° 15.839748°
Point B	-22.050831° 15.841827°
Point C	-22.063946° 15.854329°
Point D	-22.062128° 15.856514°
Point E	-22.066901° 15.860999°
Point F	-22.072281° 15.854530°

## 1.2 EPL 7008 Ownership

The EPL on which the exploration activities are proposed to be undertaken are owned by Naris Mineral Resources cc. However, the EPL's application is pending renewal approval by the Ministry of Mines and Energy (MME) and it is subject to an environmental clearance certificate (ECC) by the Ministry of Environment, Forestry and Tourism (MEFT) which would also be the resulting decision from this environmental scoping assessment.

The status of EPL 7008 application is shown on the Namibia Mining Cadastral Portal (upon searching) on this link <https://portals.landfolio.com/namibia/> and as shown on the Portal in **Figure 3** below.

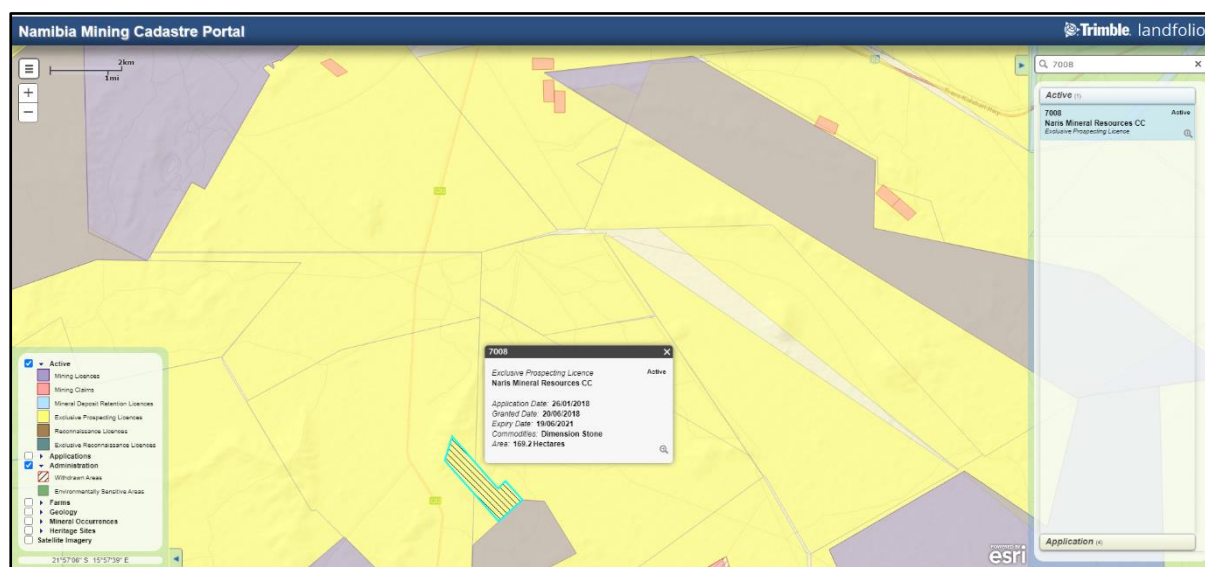


Figure 3: EPL 7008 on the Portal (source: <https://portals.landfolio.com/namibia/>)



### 1.3 Purpose of the Environmental Management Plan (EMP)

Regulation 8 of the Environmental Management Act's (EMA) (7 of 2007) Environmental Impact Assessment Regulations (2012) requires that a draft Environmental Management Plan (EMP) be included as part of the scoping Environmental Assessment (EA) 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 EA process as it synthesises all 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 environmental assessment process and the required environmental management on the ground during project implementation and subsequent operations. **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 following life-cycle stages of the proposed phases. The project phases are addressed in this EMP are as follows:

- **Planning** - the period during which preliminary legislative and administrative arrangements are carried out in preparation of exploration activities. The components that form part of this phase include obtaining land access agreements (consents) from landowners/occupiers, the preparation of worksites, setting up project infrastructure, vehicles, equipment, and machinery as well as maintenance of these infrastructure, vehicles and equipment by the Proponent, as deemed necessary.
- **Exploration phase** – during this phase, the proposed exploration works, and related activities will be carried on the targeted areas of the EPL.
- **Decommissioning and rehabilitation** – the period after which the exploration activities will be completed and during which post-exploration rehabilitation of the explored areas will be done.

## **1.4 The Environmental Consultant**

In accordance with the Environmental Management Act (2007) of Namibia and its Regulations of 2012, Agulhas Mineral Resources cc appointed OMAVI Geo-technical & Geo-Environmental consultants cc (hereinafter referred to as OMAVI Consultants or OGGC) as an independent environmental consultant to conduct an Environmental Scoping Assessment and submit the required documents as part of an application for an Environmental Clearance Certificate (ECC) to the Environmental Commissioner. This EMP is one of the required documentations to the ECC application.

This EMP was compiled on behalf of OMAVI Consultants by Ms. Fredrika Shagama (a qualified and experienced hydrogeologist and experienced and registered EAP).

## **1.5 Limitations of the Draft Environmental Management Plan (EMP)**

The following assumptions apply to this EMP:

- This report has been compiled on a scoping level with the Archaeological Assessment Study only that has been undertaken for it, i.e. no other specialist studies were done as part of this scoping assessment.
- The project specific information used in this document is as provided by the Proponent, site observations, OMAVI Consultants experience and relevant literature reviewed/research as well as the project specialists, i.e. the Archaeologists.
- OMAVI Consultants assumes that all the project technical information and data provided by the Proponent is correct and accurate, and that all necessary information has been disclosed which led to the development of this EMP.
- It is also assumed that the relevant information obtained from different literature consulted is accurate; and
- This EMP has been compiled on an assumption that there will be no significant changes to the proposed project activities or the affected biophysical and social environment between the time of compiling this EMP and implementation of the proposed project that could substantially influence findings of this document; and
- It is also assumed that there will be no significant changes to the project activities that could substantially influence the plan actions provided herein that are aimed at the management and protection of the biophysical and social environment.

## 2 BRIEF PROJECT DESCRIPTION, ACTIVITIES AND PROCESSES

The proposed activity will only entail the detailed exploration for good quality dimension stone and industrial minerals (aggregate). The proposed exploration activities are anticipated to last for six to twelve (12) months.

The project inputs, processes, outputs as well as methods are presented under the following sections of this chapter. These activities and processes would be carried out but only after the ECC has been issued by the Environmental Commissioner. The planned activities and required resources and infrastructure are presented below.

### 2.1 Project Inputs

The following resources will be required for the exploration activities:

- **Vehicles, Machinery and Equipment:** These will include 4 x 4 pickup trucks, butterfly cutter, dump trucks, diamond wire-saw cutter and coring and excavator / front-end loader to scoop sandy overburden. Further necessary machinery and equipment include Down-The-Hole (DTH) drilling rig, air compressor, diesel generator, two-way radios (for communication) and dozers (to clear vegetation along planned drilling site access paths). All equipment, machinery and vehicles will be stored at a designated area near the temporary accommodation on site.
- Movable shade facility near the working spots and prefabricated offices and accommodation (subject to approval of landowners).
- Drilling fluids to be stored in manufacturers' approved containers
- **Water supply:** water tanks with dispersion pipelines (for exploration and domestic consumption) will be on site. The anticipated water requirement is 1 000 liters per day. This water will not be abstracted from the farm or site boreholes, but it will be carted to site from elsewhere and stored in tanks. Water transportation to site will only be done on certain days of the week but not daily.
- **Fuel / Power Supply (for vehicles and machinery / equipment):** Trailer mounted diesel tank of about 3 000 litres (designed and constructed according to the South African Bureau of Standards (SABS)).
- **Fuel supply (for personnel use to prepare meals):** The Proponent will provide firewood or fuel to be used for food preparation by the site workers. No firewood will be collected on the farms, without the landowners' or occupiers' permission.

- **Water Requirements (exploration):** the amount of water required for the activities ranges between 3 000 and 6 0000 litres per day. A worst-case scenario of the water requirements, a daily volume of 5 000 litres has been considered for the assessment and as maximum for the proposed exploration activities. This value would amount to an average of 155 000 litres per month (1 860 m<sup>3</sup> or 1 860 000 per year). **It is important to note that during this phase, this water will not be abstracted from existing site boreholes but carted from outside the project area** (Proponent's Warehouse water supply line in Swakopmund) as required but not to be transported every day. The water will be stored in industry standard water tanks onsite for project use.  
The water required for this project will be mainly used for down-the-hole drilling, butterfly cutting during exploration, cleaning, and cooling off drilling/exploration equipment. Water recycling will be prioritized to conserve water. With this said, there will be no water abstraction from the local aquifers during exploration works.
- **Roads:** the EPL will be accessed from the main road (C32) via the existing local farm access (gravel) road from Karibib Town. New tracks to the different targeted exploration sites on the farms will be created. The Proponent may need to do some upgrade on the access roads to ensure that it is fit to accommodate project related vehicles, such as heavy trucks and erect temporary road signs for the duration of the exploration works.
- **Waste management:** different waste containers / bins for different waste type generated on site will be provided and emptied once a week or depending on the capacity of onsite waste storage facilities. The waste will be disposed of at the nearest approved waste management facility in the area.
- **Sanitation and human waste:** Portable ablution facilities with septic tanks will be provided on site and emptied according to manufacturers' instructions.
- **Health and Safety:** Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while on and working at site.  
A minimum of two first aid kits will be readily available on site to attend to potential minor injuries.
- **Fire management:** A minimum of basic firefighting equipment, i.e. two fire extinguishers will be readily available in vehicles, at the working sites and camps.

- **Project personnel and accommodation:** The proposed activities will employ between five and twelve (12) people (total number of skilled, semi and unskilled). Those exploration (skilled) workers / employees who may not be from the project area will be accommodated in tented camp facilities or rented farm buildings where available. Workers who will be sourced from the site area / farms will be commuting from their homes to the work sites. However, should the commuting turn out to be unfeasible for the working schedules, those local workers would be expected to be housed in temporary exploration camps with others for the duration of the project. The temporary site camps will only be set up if the farmers/landowners and occupiers of land agree to that. Therefore, agreements will need to be reached between the two parties (Proponent and farmers) prior.

## **2.2 Planned Activities: Exploration Methods**

The Proponent intends to adopt a systematic prospecting approach of the following:

- **Non-invasive techniques:** Geological mapping, reviewing of existing geological maps and historical drilling/quarrying data, Field evaluation and sampling; and
- **Invasive techniques:** Detailed exploration (Down-The-Hole drilling).

The proposed activities are summarized as follows.

### **2.2.1 Desktop Study**

The exploration program will commence with a review of geological maps and historical drilling and/ or quarrying data for the area, if any.

### **2.2.2 Field Evaluation**

The field evaluation is to be carried out by a qualified geologist, aimed at locating suitable host rock outcrops in the field from where the:

- General soundness (intactness).
- Appearance (patterns and colour); and
- Joint and vein spacing can be evaluated.

Small samples (about 30 cm<sup>3</sup> in dimension) will be removed for cutting and polishing to provide insights on whether the stone can be polished to an acceptable finish, as well as to give an indication of the hardness of the stone from a sawing and finishing point of view. Where field evaluation indicates a potentially economical viable deposit, detailed geological mapping will be conducted by means of mapping transversely across exposed / cleaned segments of the rock unit. Where cleaning of the rock unit is required to aid geological mapping, air compressors will be used to expose the rock. The mapping is aimed at delineating major geological structures such as fault and shear zones (zones of weakness), the extent of veins, as well as further delineation of fracture / discontinuity frequencies.



### 2.2.3 Detailed Exploration

The refined geological map would then assist in target generation for subsequent detailed exploration such as drilling and possibly test quarrying. A typical drill rig used for this type of exploration drilling is shown in **Figure 4** below.



**Figure 4:** A typical example of a Down-The-Hole drill rig

A vertical and inclined core drilling with a down-the hole (DTH) drill rig will be carried out in selected areas to provide information on the:

- Vertical extent of the host (dolerite) formation.
- Color and texture.
- Joint spacing or
- Possible defects at depth.

It is anticipated that drilling activities will require a small (6m wide) tracked access roads to gain access to the actual drilling sites for the air compressor and water truck.

### 2.2.4 Feasibility Study: Test Quarrying (Exploration Component)

Where exploration drilling yields positive results, test quarrying by means of butterfly cutting will be conducted. This will be done to fully evaluate the recovery of saleable blocks, and better optimize the extraction methods, production rates and operational costs in future. The exploration test quarrying will only be carried out on select targeted areas of the EPL and shall be performed on as small areas as possible to minimize environmental impacts that are associated with test quarrying. The outcomes / results of the test quarrying will be recorded and archived by the Proponent for future use (when mining will be considered depending on the outcome of exploration).

**It is important to note that the test quarrying referred to above is only a component of exploration activities, to be done at a very small-scale level on targeted sites of the EPL to enable the Proponent to get sufficient and reliable exploration data, but not for mining purposes. Therefore, this ESA process and its subsequent reporting will only cover exploration activities.**

### **2.3 Rehabilitation of explored Sites and Decommissioning**

The impact on the physical environment can be lessened by planning with future decommissioning of explored sites within the EPL boundaries in mind. Therefore, towards the end of each exploration activity on active sites of the EPL, progressive / ongoing rehabilitation will be carried out by the Proponent. This can be achieved through rock shading, and partial backfilling with topsoil. This will be done to ensure that the disturbed land sites are left close to their pre-exploration state as much as possible.

Included in the rehabilitation and decommissioning is also the dismantling and removal of campsite, and associated structures from the project sites and area.

## **3 EMP IMPLEMENTATION AND RESPONSIBILITIES**

The EMP has identified the Exploration Manager, Safety, Health and Environment (SHE) Officer and Public Relation Officer (PRO) as important roles to guide the environmental management of the proposed exploration activities. It should be noted that in practice, however, these roles may be assigned to and performed by one person, due to various foreseen and unforeseen circumstances.

A list of specific responsibilities and duties to be undertaken by each are provided below. It should also be noted that the above-mentioned roles are delegated roles and Agulhas Mineral Resources cc is ultimately responsible for the implementation of the EMP.

### **3.1 The Exploration Manager (or the Proponent)**

This Manager **who may also be the Proponent**, will be responsible for the following:

- Managing/overseeing the implementation of this EMP and updating and maintaining it when necessary.
- Issuing fines to individuals who contravene EMP provisions and if necessary, removing such individuals from site.
- Setting up and managing the schedule for the day-to-day activities.
- Liaison with all relevant interested and affected parties/stakeholders.
- Ensuring all incidents are recorded and documented.
- Undertaking an annual review of the EMP and amending the document when necessary.

### 3.2 Safety, Health and Environmental (SHE) Officer

The SHE Officer will be responsible for the following activities:

- Planning and carrying out site inductions to the workers on-site and visitors to the worksite(s).
- Ensure that the requirements of the EMP are carried out during applicable activities throughout the project life span.
- Monitor the overall implementation of the EMP.

### 3.3 Public Relation Officer (PRO)

The Public Relation Officer will be responsible for the following tasks:

- Liaising between the affected farmers (property owners) and/or occupiers of land and the Agulhas Mineral Resources.
- Ensure effective communication with stakeholders (affected farmers or landowners or occupiers of land), media (if necessary) and the public.
- Managing public relations issues.
- Preparing and submitting public relations reports, if required.
- Collaborating with personnel and maintaining project-related open communication among personnel.

### 3.4 Archaeology: Chance Finds Procedure (CFP) Implementation Roles

The following personnel have been assigned responsibilities as per the Chance Finds Procedure (**Appendix 1**) provided in the Archaeological Assessment conducted for the proposed activities:

#### 3.4.1 Operator

To exercise due caution if archaeological remains are found

#### 3.4.2 Foreman

To secure site and advise management timeously

#### 3.4.3 Superintendent

To determine safe working boundary and request inspection

#### 3.4.4 Archaeologist

To inspect, identify, advise management, and recover remains.

The Proponent should assess these commitments in detail and should acknowledge their obligation to the specific management actions detailed in the Tables of the following sections.

## 4 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN ACTIONS

This chapter presents the environmental and social mitigations measures (management plan actions) and the list of legal requirements in terms of permitting and licensing for certain project activities.

The aim of the management plan actions laid provided in Tables below is to avoid potential impacts where possible. Where impacts cannot be avoided, measures are provided to reduce the significance of these impacts.

These management plan actions are a "translation" of mitigation measures recommended to manage the potential impacts identified in the project's Environmental Scoping Report.

Apart from the applicable authorizations (licenses and permits) Table, the management plan actions for the planning and exploration phases will be presented under one Table with clear indications of phases, if deem necessary.

### 4.1 Applicable Legislation: Authorisation (Permits and Licenses)

This section covers information on the legal obligations (legislations, policies, and guidelines) that governs certain project activities, where permitting and/or licensing may be required from different applicable regulatory authorities - Please refer to **Table 2** below. The full list and description of the legal framework (where permits are required or not) is presented in the Scoping Report.

**Table 2: Applicable legislations in terms of permits or licenses for the proposed exploration activities**

Legislation	Provisions	Contact Details
Environmental Management Act 2007 Environmental Impact Assessment (EIA) Regulations (EIAR) (GG No. 4878)	Activities listed in Government Notice (GN) No. 29 of GG No. 4878 require an Environmental Clearance Certificate (ECC). The amendment, transfer, or renewal of the ECC (EMA S39-42; EIAR Regs19 & 20). Amendments to this EMP will require an amendment of the ECC. <b><u>The ECC needs to be renewed every 3 years.</u></b>	<b>Mr Damian Nchindo (Ministry of Environment, Forestry and Tourism's Department of Environmental Affairs and Forestry (DEAF) – Chief Conservation Scientist)</b> <b>Tel: (061) 284 2701</b>
The Water Act 54 of 1956 The Water Resources Management Act No. 11 of 2013 (unpromulgated)	The Water Act 54 of 1956 was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas. <b>Provision for a Groundwater abstraction and use permit for commercial use to be applied for and obtained from the Department of Water Affairs (DWA): Directorate of Water Resources Management. When issued, Proponent, the</b>	<b>Mr Franciskus Witbooi (Deputy Director: Water Policy and Water Law Administration.</b> <b>Tel: (061) 208 7158</b>

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

<b>Legislation</b>	<b>Provisions</b>	<b>Contact Details</b>
	<b>permit should be renewed as required (as stipulated in therein).</b>	
Mineral Prospecting & Mining Act (Act No. 33 of 1992)	<p>Section 38 (1): Applications for renewal of registration of EPLs.</p> <p>The Proponent should ensure that all the necessary permits/authorisation for activities performed on the EPL are obtained from the Ministry of Mines &amp; Energy (MME)'s Mine Directorate.</p> <p>Section 54(2): details provisions pertaining to the decommissioning or abandonment of a mine / explored sites because of related activities.</p>	<p><b>Mr Erasmus Shivolo (Mining Commissioner)</b>  <b>Tel: 061 284 8167</b></p>
	Under this Act (Section 51 (1a)), holder of a mineral license cannot exercise any rights on a private land until the holder has entered into an agreement with the owner regarding payment of compensation	<b><u>The Proponent should on time enter into and sign access and land use agreement (consent) with respective affected farm owners or representatives of the occupiers of land.</u></b>
Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations	<p>Provides for the control of traffic on public roads and the regulations pertaining to road transport, including the licensing of vehicles and drivers.</p> <p><b>A site access road permit from the main road (B2) should be applied for and obtained from the Roads Authority and conditions set therein to be compiled with</b></p>	<p><b>Mr Eugene de Paauw (Roads Authority – Specialist Road Legislation)</b>  <b>Tel.: (061) 284 7027</b></p>
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"	<p><b>Carlo Mcleod (Ministry of Mines and Energy: Acting Director – Petroleum Affairs)</b>  <b>Tel.: (061) 284 8291</b></p>
Forestry Act (No. 12 of 2001)	Permits are required for the removal of protected plants species.	<b>The nearest Forestry Office (Ministry of Environment, Forestry and Tourism)</b>
Nature Conservation Ordinance No. 4 of 1975 (as amended)	Permits are required for the removal of protected plants species.	<b>Mr Joseph Hailwa (Director: Forestry), Tel: (061) 208 7663</b>
National Heritage Act (Act No. 27 of 2004)	The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the	<p><b>Mr Manfred Gaeb (Regional Heritage Officer) – National Heritage Council of Namibia</b>  <b>Tel:(061) 301 903</b></p> <p><b>OR</b></p> <p><b>Ms. Agnes Shiningayamwe (Regional Heritage Officer) – National Heritage Council of Namibia</b></p>



Legislation	Provisions	Contact Details
	National Heritage Council. Section 51 (3) sets out the requirements for impact assessment.  Should any objects of heritage significance be identified during the exploration, the work must cease immediately in the affected sites and <b>the necessary steps taken to seek authorisation from the Council.</b>	<b>Tel: (06) 301 903</b>
Labour Act 11 of 2007 Health and Safety Regulations (HSR) GN 156/1997 (GG 1617).	Adhere to all applicable provisions of the Labour Act and the Health and Safety regulations.	<b>No permit is required, but adherence to the Act's Relevant Regulations is highly recommended.</b>

## 4.2 Planning, Exploration and Decommissioning Phases

The management plan actions for the planning, exploration, and decommissioning phases are presented under **Table 3** below. The Table contains the environmental aspect for which the management actions are required, mitigation measures, key performance indicators, responsible person(s), resources or proof and the timeline of such management actions.

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Table 3: Management Plan Actions for the Planning, Exploration, and Decommissioning Phases

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
<b>PLANNING PHASE</b>						
EMP implementation and training	Lack of EMP awareness and implications thereof	<p>A Comprehensive Health and Safety Plan for the project activities should be compiled. This will include all the necessary health, safety, and environmental considerations applicable to respective works on sites.</p> <p>An EMP non-compliance penalty system should be implemented on site.</p> <p>The Proponent should appoint an SHE Officer to be responsible for managing the EMP implementation and monitoring.</p>	<p>All required Plans and systems are compiled and in place</p> <p>Safety, Health and Environmental (SHE) Officer is appointed</p>	Proponent	Records of EMP implementation Plans and Systems	Pre-exploration (project activities)
Authorizations	Lack of Agreements, Permits/ Licenses	<p>All the required agreements and licenses or permits should be applied for and signed, respectively before commencement of work on the EPL, or as required.</p> <p>The permits, agreements referred to herein include land access &amp; use (by land/farm or property owners or representatives of the occupiers of land) for exploration by the property owners, as well as petroleum storage permits from Ministry of Mines and Energy (MME).</p>	<p>Applicable permits and licenses to be obtained from relevant authorities and kept on site for records keeping and future inspections</p> <p>Agreements signed and obtained from landowners or occupiers of land on time, <b>min. 2 months prior to planned commencement date of works</b></p> <p><b>Petroleum storage permits obtained</b></p>	Proponent	<p>Permits and Licenses</p> <p>Signed Land Access and Use Agreements</p>	Prior to exploration

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
Communication between the Proponent and landowners or occupiers of land	Lack of communication (proper liaison) between farmers and Proponent with regards to land use	<p>The Proponent should appoint a Public Relation Officer (PRO) to liaise with the farmers/landowners.</p> <p>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 during the exploration activities.</p> <p>A clear communication procedure/plan which should include a grievance mechanism should be compiled</p>	<p>A PRO is appointed</p> <p>Ongoing Stakeholders' and Public Engagement &amp; Consultation throughout the project cycles, when and as required</p>	Proponent	<p>Complaints logbook</p> <p>PRO contact details to be provided to the affected farmers/landowners</p> <p>Records of Stakeholders' and Public Consultations</p>	PRO appointment (Prior to project activities) and their responsibilities throughout the project activities
Employment	Creation of employment opportunities	<p>Non-skilled labour should be sourced from the locally affected area (people from the local communities), in accordance with procedures approved by the relevant authorities.</p> <p>Equal opportunities should be provided for both men and women.</p>	Number of locals employed for exploration activities	Proponent in collaboration with the Exploration Manager (if necessary)	Record of employees	Pre-project activities and when necessary, throughout
Specialised procurement of services	Exploration contractors and services	All services related to exploration activities such as blasting and drilling that the Proponent may need, preference should be given to local providers of such services. If not available locally, the services search should be extended to a Regional level (Erongo Region) and lastly, nationally, or	Number of hired contractors	Proponent	Record of hired or contracted companies or services providers	Pre-project activities and when necessary, throughout

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		international, if all efforts truly yield no success.		Exploration Manager		
<b>EXPLORATION PHASE</b>						
EMP implementation and training	Lack of EMP awareness and implications thereof	<p>EMP trainings should be provided to all new workers on site and to old workers (as a refresher) every 6 months.</p> <p>All site personnel should be aware of necessary health, safety, and environmental considerations applicable to their respective work</p> <p>The implementation of this EMP should be monitored.</p> <p>The site should be inspected, and a compliance audit done throughout <b><u>the project activities, monthly.</u></b></p> <p>An EMP non-compliance penalty system should be implemented on site.</p>	<p>Compliance monitoring conducted monthly for the exploration phase and should be recorded</p> <p>EMP Refresher training for employees/workers every 6 months</p> <p>Timely renewal of the Environmental Clearance Certificate (ECC) every 3 years</p>	SHE Officer	<p>Monitoring reports</p> <p>ECC renewed on time</p> <p>Records of EMP training conducted</p>	Throughout the exploration phase
Communication between the Proponent and landowners or occupiers of land	Lack of communication (proper liaison) between farmers and Proponent with regards to land use	<p>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 during the exploration activities.</p> <p>The Proponent should compile a clear communication procedure/plan which should include a grievance and response mechanism.</p>	PRO is part of the project personnel	PRO	<p>Complaints logbook</p> <p>PRO contact details to be provided to the affected farmers/landowners</p>	Throughout the project activities

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		The Proponent should enter into a written agreement with landowners before carrying out exploration activities on their land.				
Water Resources Use	Over-abstraction (water demand and availability)	<p>the Proponent should make provision for continued water carting to site to provide water required for exploration.</p> <p>Water should be efficiently used by implementing water saving measures such as recycle and re-use where necessary and possible. This includes using water for cooling exploration equipment for the cleaning of project equipment.</p> <p>Water conservation awareness and saving measures training should be provided to all the project workers so that they understand the importance of conserving water and become accountable.</p>	Proof/ recording/ quantification of water saving efforts.	Exploration Manager	Records of Permit issuance and renewals	Pre-exploration phase  Throughout
Soils	Physical soil/land disturbance and loss of topsoil	<p>Overburden should be handled more efficiently during both exploration operations to avoid erosion when subjected erosional processes</p> <p>Prevent creation of huge piles of waste rocks by performing sequential backfilling.</p> <p>Soils that are not within the intended ad targeted footprints of the site should be left undisturbed and soil conservation implemented as far as possible.</p> <p>Project vehicles and machinery should stick to access roads provide and or meant for</p>	<p>No proliferation of informal vehicle tracks.</p> <p>No new erosion gullies.</p>	SHE Officer	Complaints logbook	Throughout the exploration phase



**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		the project operations but not to unnecessarily create further tracks on site by driving everywhere resulting in soil compaction.				
Soils and water resources	Soils and water resources pollution	<p>Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching groundwater bodies. Some of the soil control preventive measures are:</p> <ul style="list-style-type: none"> <li>-Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites.</li> <li>-Vehicles, machinery, equipment, and fuel storage tanks should be maintained to ensure that they are in good condition thus preventing leaks and spills.</li> <li>-The oil storage and use locations should be visually inspected for container or tank condition and spills.</li> <li>-Maintain a fully provisioned, easily accessed spill kit. Spill kits should be located throughout the active project sites contain the floor dry absorbent material and absorbent booms, pads, mats. These would be suitable for ground surface areas that are covered mainly by hard rocks.</li> </ul>	<p>No complaints of pollutants on the soils and eventually in the water due to exploration activities</p> <p>No visible oil spills on the ground or contaminated/polluted spots.</p>	SHE Officer	<p>Complaints logbook</p> <p>Waste containers</p> <p>Non-permeable material to cover the ground surface at areas where hydrocarbons and potential pollutants are utilized.</p>	Throughout exploration phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>-All project employees should be made aware of the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures.</p> <p>-The Proponent should 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.</p> <p>-Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired in each phase of the project.</p> <p>Exploration site areas where hydrocarbons will be utilized, the surface should be covered with an impermeable plastic liner (e.g. an HDPE liner), carefully placed so as to minimize risk of puncturing, to prevent any spillages from getting into direct contact with the soils and prevent eventual infiltration into the ground.</p> <p>Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated during exploration works.</p> <p>All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site</p>				

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>and later disposed of at nearby approved waste sites in accordance with MAWLR's Water Environment Division standards on waste discharge into the environment. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the groundwater quality.</p> <p>In cases of accidental fuel or oil spills on the soils from site vehicles, machinery and equipment, the polluted soil should be removed immediately and put in a designate waste type container for later disposal as per the preceding bullet point. The removed polluted soil should either be completely disposed of or cleaned and returned to where it was taken from on site or can be replaced with a cleaner soil. This is to ensure that the pollutants contained int the soil does not infiltrate into the site soils and eventually reach to groundwater.</p> <p>Although fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer, 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 exploration sites are cleaned on time (soon after the spill has happened)..</p> <p>The fuel storage tank should be placed on a bunded and impervious surface.</p> <p>Polluted soil must be collected and transported away from the site to an</p>				

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>approved and appropriately classified hazardous waste treatment facility.</p> <p>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.</p> <p>Toilet water should be treated using one of the following methods:</p> <ul style="list-style-type: none"> <li>-discharged into chemical toilets and periodically emptied out before reaching capacity and transported to a wastewater treatment facility.</li> <li>-type of pit latrine (where excreta in the pit is treated to prevent the waste from being a water pollution risk).</li> </ul>				
Biodiversity	Loss of Fauna and Flora	<p><b>Flora:</b></p> <p>At any water course such as site creeks, streams or rivers, exploration works should not be done within 50 m of these water courses to avoid the destruction of flora habitat.</p> <p>The Proponent should avoid unnecessary removal of vegetation, thus promoting a balance between biodiversity and project operations/activities.</p> <p>Vegetation found on the site, but not in the targeted exploration areas should not be</p>	<p>No disturbance to unmarked areas.</p> <p>No complaints from locals regarding unauthorised vegetation removal or cutting down of trees.</p>	SHE Officer	<p>Barricading tape (to indicate working areas)</p> <p>Complaint logbook</p>	Throughout the exploration phase

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>removed but left to preserve biodiversity on the site.</p> <p>Movement of vehicle and machinery should be restricted to existing roads and tracks to prevent unnecessary damage to the vegetation.</p> <p>No onsite vegetation should be cut or used for firewood related to the project's operations. The Proponent should provide firewood for onsite camping workers from authorized firewood producers or sellers.</p> <p>Even if a certain shrub or tree is found along exploration sites, this does not mean that it should be removed. Therefore, care should be taken when exploring without destroying the site vegetation, unnecessarily.</p> <p><b><u>Fauna</u></b></p> <p>Workers should refrain from killing species (big or small and all types) that may be found on and around the site, including rock outcrops' species.</p> <p>Workers should refrain from disturbing, killing or stealing locals' animals (livestock).</p> <p>Project personnel are not allowed to kill or in any way disturb local livestock.</p> <p>Environmental awareness on the importance of biodiversity preservation should be provided to the workers.</p>	<p>No complaints of livestock theft, snaring or killing of livestock by the project personnel.</p>			

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
Illegal hunting	Illegal hunting of wildlife	<p>For future provision, should the wildlife re-appear in the area, no hunting by exploration personnel is allowed.</p> <p>Site personnel should refrain from killing/poaching or snaring or intentionally disturbing local animals that may be found on and around the exploration sites.</p>	Incident reports of illegal hunting of wildlife by the crew.	SHE Officer	Complaints logbook	During site set up, and throughout exploration phase
Aesthetics of the area	Visual impact	<p>Implementation of continuous rehabilitation programme, by using overburden waste rocks should be considered.</p> <p>Utilize waste rubble to rock blind exposed rock faces and stockpiled topsoil to partially back fill to promote progressive rehabilitation of explored sites.</p> <p>Carrying out of progressive working and restoration/rehabilitation over the shortest timescale possible, to avoid excessive areas of disturbance.</p> <p>Consider the phased exploration and direct placement of overburden (topsoil and waste rocks) and other site-derived materials to allow progressive restoration around the margins of the explored site areas.</p> <p>Implementation of other suitable best international practice visual mitigation measures.</p> <p>Drilling/cutting for dimension stone exploration should be done away from the crests of koppies and outcrops as possible</p>	<p>No further major contribution to the visual impact in the area.</p> <p>No complaints from the locals regarding major eyesore due to unmanaged site restoration</p>	Exploration Manager	Complaints logbook Record of progressive backfilling done to reduce landscape contrast	Throughout the exploration phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		particularly for the EPL areas where test quarrying will be undertaken.				
Health and safety	General health and safety associated with project activities in both phases	<p>The Labour Act's Health and Safety Regulations should be complied with.</p> <p>As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs.</p> <p>When working on site, employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc.</p> <p>Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible.</p> <p>Drilled boreholes 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.</p> <p>Ensure that after completion of exploration holes, drill cuttings are put back into the hole and the holes filled and levelled.</p> <p>An emergency preparedness plan should be compiled, and all personnel appropriately trained.</p>	Comprehensive health and safety plan for all exploration activities compiled.	Exploration Manager	Time, printing resources.	Prior to site setup activities and throughout the phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>Workers should not be allowed to drink alcohol prior to and during working hours as this may lead to mishandling of equipment which results into injuries and other health and safety risks.</p> <p>Workers should not be allowed on site if under the influence of alcohol.</p> <p>The site to be equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site.</p> <p>Temporary enclosed boundaries should be erected around high-risk area sites for the duration of project activities at that specific site area. This is done to control access to the site, in such a way that the public, especially children do not access the site and play with equipment and machinery on days when no work is done.</p> <p>A security guard or guards should be part of the team so that they can look after the project equipment and vehicles that would be left on site in weekends or public holidays (when no work is done) to ensure that no unauthorized person enters the area.</p> <p>To discourage the unsuspecting and uniformed local community from eyeing the empty hazardous containers, the site workers should if possible, drill holes in these containers while kept on site (before transporting the containers to the waste site).</p>				



**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		All employees and contractors (personnel) to be trained on environmental awareness, the Proponent's internal Environmental Health and Safety Policy, Environmental Management Plan, and engagement with key stakeholders, specifically the key government ministries and farmers				
Health and safety	Accidental fire outbreak	<p>Portable fire extinguishers should be provided on site.</p> <p>No open fires to be created by exploration personnel.</p> <p>Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage.</p>	No wildfires recorded (due to presence of workers)	SHE Officer	Fire extinguishers (1 per vehicle) and 1 per working site	Throughout exploration phase
Archaeology and heritage	Accidental disturbance and destruction of archaeological or heritage objects and sites	<p>Caution should be exercised when carrying out excavations associated with the exploration activities if archaeological/heritage remains are discovered.</p> <p>Identified of any archaeological significant objects on the site should not be disturbed but are to be reported to the project Environmental/Safety officer or National Heritage Council offices for further instructions and actions.</p> <p>Workers should be educated to not destroy or throw away but report (to the environmental/Safety officer) of any unknown object found/discovered on site.</p>	Preservation of all artefacts that are discovered around project area	<p>SHE Officer</p> <p>Operator</p> <p>Foreman</p> <p>Superintended</p>	<p>Salvage equipment</p> <p>Flag tapes</p> <p>GPS (site marking)</p>	As and when required, i.e., prior to site set up, during exploration and after

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>The worksite manager should familiarise themselves with the National Heritage Council's Chance Finds Procedure (CFP) - please refer to <b>Appendix 1 of this document</b> and if uncertain about the procedure should receive training by a suitably qualified archaeologist with respect to the identification of archaeological/heritage remains and the procedures to follow if such remains are discovered throughout the project activities' duration. The CFP is attached to the EMP.</p> <p><b><u>Site specific Mitigation measures by the Archaeologist</u></b></p> <p>A Professional Archaeologist must be on site to monitor during clearing on the affected areas.</p> <p>Although the possibility of encountering previously unidentified burial sites is low within the proposed EPL, should such sites be identified during subsurface exploration work, they are still protected by applicable legislations and they should be protected. Therefore, the preceding recommended actions given above should be taken.</p>		Archaeologist		

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p><b>Emphasis:</b> sub-surface materials may still be lying hidden from surface surveys. Therefore, <b>absence (during surface survey) is not evidence of absence all together.</b> The recommended and necessary measures, monitoring and reporting procedures must be followed in the event of a chance find, to ensure compliance with heritage laws and policies for best practice.</p> <p><b>It is recommended that:</b></p> <ul style="list-style-type: none"> <li>-The Project Public Participation Process should ensure that any cultural heritage related matters for this project are given due attention whenever they arise and are communicated to the NHC throughout the proposed project exploration. This form of extended community involvement would pre-empt any potential disruptions that may arise from previously unknown cultural heritage matter that may have escaped the attention of this study.</li> <li>-The footprint impact of the proposed exploration should be kept to minimal to limit the possibility of encountering chance finds within servitude.</li> </ul>				

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>-In situations where unpredicted impacts occur (such as accidentally disturbing a previously unknown grave), exploration should be stopped, and the heritage authority notified immediately. In the unlikely event of chance archaeological material or previously unknown human remains being disturbed during subsurface exploration, the finds should be left in situ subject to further instruction from the project archaeologist or heritage authorities.</p> <p>-It is recommended that the old windmill and its drinking trough which are currently in use by the current farm owner be protected and any exploration near the facility be minimised if not avoided.</p>				
Local Services infrastructure	Damage to buried water pipelines and or cables	<p>The Proponent's Public Relation Officer (PRO) should consult with the farmers to help in locating potential buried water pipelines or power cables on their properties (farms) to avoid damages.</p> <p>If possible, heavy trucks should avoid driving over farm areas that are known to have pipelines or any related infrastructure buried.</p> <p>The project personnel should be informed not to leave the farms' gates open, but close</p>	Complaints from farm owners or occupiers of land about damaged water pipes and fences or gates left open.	<p>PRO</p> <p>SHE Officer</p>	Complaints logbook Gate locked Record of known areas with buried services infrastructure	Pre- exploration phase and then throughout

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>or lock them as instructed by the farm owners.</p> <p>Project equipment and machinery should not be left leaning on the farm fences (using the fences as support).</p> <p>Agreement and continued engagement with landowners / farm owners on use and maintenance of farm infrastructure (roads, fences, gates, boreholes, etc.) should be implemented and maintained.</p>				
Littering and waste management (general waste and sanitation)	Environmental Pollution	<p>Project workers should be sensitized to dispose of waste in a responsible manner and not to litter.</p> <p>After each daily works, there should not be waste left scattered on site, but rather be disposed of in allocated site waste containers.</p> <p>No waste may be buried or burned on site or anywhere else throughout the project lifecycle.</p> <p>All domestic and general waste produced daily should be contained until such that time it will be transported to designated waste sites on a weekly basis.</p> <p>The sites should be equipped with separate waste bins for hazardous and general waste/domestic.</p> <p>Hazardous waste, including emptied chemical containers should be safely stored</p>	No visible litter around the project area	SHE Officer	Waste storage containers	Throughout exploration phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>on site where they cannot be accessed and used by uniformed locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e. unapproved waste sites.</p> <p>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 to the nearest approved hazardous waste sites.</p> <p>A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented.</p>				
	Wastewater generated by exploration workers living on-site.	<p>Provision of toilet facilities for exploration workers (type of pit latrine or chemical toilet).</p> <p>Emptying of chemical toilets according to the manufacturer's specifications. Treating latrine waste to render non-polluting.</p>	Adequate toilet facilities on site.	SHE Officer	Chemical toilets or excavator (pit creation), waste treatment agents/chemicals	At site setup and throughout exploration phase
Vehicular Traffic	Traffic safety	<p>The transportation of exploration materials, equipment and machinery should be limited to once or twice a week only, but not every day.</p> <p>The heavy truck loads should comply with the maximum allowed limit while transporting materials and</p>	No complaints from members of the public regarding vehicular traffic issues related to the project	SHE Officer	None	<p>Throughout exploration phase</p> <p>Site access permit (s) to be</p>

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>equipment/machinery on the public and access roads.</p> <p>The carted water into the area from Walvis Bay or other source of water supply should be done once or twice a week in container that can supply and store water for most of the week, thus reducing the daily number of trucks on the road.</p> <p>The site access road(s) should be upgraded to an unacceptable standard to be able to accommodate project related vehicles and access permits obtained from the Roads Authority.</p> <p>The site access road(s) should be provided for in such ways that they do not interfere with other traffic movement and/or compromise traffic safety on the host farms.</p> <p>Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses.</p> <p>Vehicle drivers should adhere to the road safety rules.</p> <p>Drivers should drive slowly (40km/hour or less), and on the lookout for livestock and wildlife.</p> <p>Ensure that the site access roads are well upgraded and in good condition to cater for vehicles travelling to and from site throughout the project's life cycle</p>	<p>All personnel operating the project vehicles and machinery are appropriately licensed and possession of valid driving licenses.</p> <p>Demarcated areas for parking, offloading, and loading zones are on sites</p> <p>Site access road permits obtained, and requirements fulfilled</p>			<p>applied for and obtained prior to commencement of exploration works</p>

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents due to mechanical faults of vehicles.</p> <p>Vehicle drivers should only make use of designated site access roads provided.</p> <p>Vehicles drivers should not be allowed to operate vehicles while under the influence of alcohol.</p> <p>Sufficient parking area for all project vehicles should be provided for and clearly demarcated on sites.</p> <p>The Proponent should make provision for safe materials and equipment offloading and loading areas on sites.</p> <p>No heavy trucks or project related vehicles should be parked outside the project site boundary or demarcated areas for such purpose.</p> <p>Truck movements, frequency, times, and routes should be carefully planned and scheduled – please refer to the next point.</p> <p>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 8am and 5pm.</p> <p>Site access roads should be provided for in such ways that they do not interfere with</p>				



**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		other traffic movement and/or compromise traffic safety on the host farms				
Air Quality	Dust generation	<p>Drill and excavating/blasting equipment should be regularly maintained to ensure drilling and excavation efficiency and so reduce dust generation.</p> <p>Dust masks, eye protective glasses and other respiratory personal protective equipment (PPE) accessories should be provided to the workers on site, specifically the ones exposed to dusty site area and activities.</p> <p>The impact mitigation measures should be covered in the relevant farm access agreement as required by law on commercial farms. This should also be considered for resettled farms.</p> <p>The Proponent should ensure that the project activities schedules are limited to the given number of days of the week, but not every day. This will keep the vehicle-related dust level minimal in the area.</p> <p>Since the project site is in an area where due to little vegetation cover, soils are exposed, it is highly probable that more dust will be generated from excavation and drilling works and heavy vehicle movements on bare dry soils. It is therefore advised that in extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain exploration areas at the sites. In other words,</p>	<p>No complaints from the public about vehicle emissions and dust generation.</p> <p>Visible efforts to curb dust</p>	SHE Officer	<p>Complaints logbook</p> <p>Vehicle and machinery mechanic</p>	Throughout exploration phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>Dry dust suppression methods such as reasonable amount of water should be employed to minimise dust generation.</p> <p>The transportation of exploration materials, equipment and machinery should be limited to certain days of the week only as so to reduce dust generated by heavy vehicles in the area.</p>				
Noise	Nuisance	<p>The transportation of exploration materials, equipment and machinery should be limited to once or twice a week only, but not every day.</p> <p>Noise from project vehicles and equipment on site should be reduced to acceptable levels.</p> <p>The exploration times should be set such that, no such activities are carried out during the night or very early in the mornings (to be limited between 8am and 5pm on weekdays).</p> <p>Project hours should be restricted to between 8am and 5pm to avoid noise generated by project equipment and the movement of vehicles before or after hours.</p> <p>When operating the blasting and drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.</p>	Complaints from residents about excessive noise.	SHE Officer	Complaints logbook	At site set up and throughout exploration phase

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>Targeted exploration sites that may be found to be within less than 1 km from the residence (farmhouses) should be avoided at all cost. This is done to preserve some tranquillity for the residents.</p> <p>If the Proponent does not already have a blasting expert or the experience, an experienced blasting contractor should be hired to carry out exploration activities in a professional manner such that noise is kept at minimum as a result of a very good "know-how" with the utilized blasting machinery and equipment</p>				
Social nuisance	Job seeking and crashes due to differing norms, culture, and values	<p>Priority of employment should be given to local people, and only if necessary and due to lack of skills in the area, out-of-area people can be given some of the work.</p> <p>The locals to be employed during the project phases should be provided with the necessary training of skills required for the project to avoid bringing in many out-of-area employees.</p> <p>The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections.</p> <p>Out-of-area workers that may be employed (due to their unique work skills) on site should be sensitized on the importance of respecting the local values and norms, so</p>	<p>Correct and fair recruitment procedures are followed and practised.</p> <p>More local people are employed for both skilled, semi and unskilled works</p> <p>Out-of-area people only employed for specialized skills that are not found in the project area.</p> <p>No complaints of unfair recruitment procedures.</p> <p>Grievance and response records</p>	<p>Exploration Manager</p> <p>PRO</p>	<p>Records of employees and their places of origins in relation to the site area</p>	<p>Pre-exploration</p> <p>In special cases, during the project phases, depending on the project needs</p>



**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

Aspect	Impact	Mitigation Measure(s)	Key Performance Indicator (KPI)	Responsible Party	Resources	Timeline
		<p>Site workers are not allowed to kill or in any way disturb local livestock.</p> <p>No worker should be allowed to, without permission cut down or damage trees belonging either the farm owner, the neighbouring farms or in the already scarce community vegetation.</p>				
<b>PROGRESSIVE REHABILITATION AND DECOMMISSIONING PHASE</b>						
Rehabilitation	Disturbance and damaging of land site land	<p>All drilled boreholes and excavated pits related to the project activities should be capped and backfilled, respectively.</p> <p>All waste generated and store on site during exploration activities should be disposed of at the respective nearest solid waste management sites.</p> <p>The stockpiled topsoil should be levelled during exploration activities.</p> <p>Any temporary work camps setup should be dismantled, and the area rehabilitated as far as practicable, to their original state.</p> <p>Explored areas on worksites should be progressively rehabilitated by stockpiling and backfilling.</p> <p>Provision of both financial and technical resources for progressive rehabilitation and post-exploration activities should be made.</p>	<p>Capped boreholes and backfilled pits</p> <p>No sign of waste or littering seen on site and around site areas</p> <p>No stockpiled topsoil (topsoil is levelled after completion of each work)</p> <p>Campsite dismantled and materials taken away from site</p> <p>Visible signs of stockpiled topsoil</p> <p>Annual update of finances reserved for decommissioning</p>	Proponent	<p>Record of boreholes drilled, and pits excavated (if any)</p> <p>Waste containers on sites</p> <p>Photo records of backfilled sites</p> <p>Records of campsite</p> <p>Records of finances set aside for decommissioning activities</p>	Throughout the exploration phase

### 4.3 Monitoring of EMP Implementation

To support and ensure that the proposed mitigation measures are achieving the desired results throughout the project phases, a monitoring plan must be implemented alongside the mitigation plan. **Table 4** presents the required environmental monitoring in terms of each potential impact, parameters to be monitored and monitoring objective. Included in the same Table is the reporting structures for monitoring, frequency, methods to be used, reporting structure, any thresholds that apply and relevant recommended actions.

The Table presents the monitoring implementation for the exploration phase, given the similarity in activities, hence the 'reporting structure' column presented as 'Exploration manager'. Therefore, the monitoring exercise will be done according to the relevant project stage or phase. In other words, for monitoring of mitigation implementation in the exploration phase, the reporting structure ends with the Exploration Manager.

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

Table 4: Monitoring requirements for impact mitigation measures (update 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
<b>Water and soil pollution</b>									
Soil pollution by hydrocarbon (fuel and lubricant spills)	Complaints from farmers or occupiers of land within the project sites	To prevent contamination of site soils	No complaints from farmers about visible oil spills	Inspection of complaints logbooks	Weekly	SHE officer	SHE Officer> Exploration Manager	A logged complaint	Further consultations with the farm/landowners
Wastewater generated by exploration workers living on-site.	Open defecation and urination.	To prevent environmental pollution	Adequate toilet facilities on site. Complaints from the public about open defecation and urination.	Visual observation. Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Exploration Manager	A logged complaint	Clean-up of affected areas.
<b>Soils</b>									
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	SHE Officer	SHE Officer> Exploration Manager	Proliferation of new vehicle tracks Formation of new gullies in work areas	Rehabilitation of affected explored areas
<b>Air quality</b>									
Increase in dust generation, which might	Complaints from public about increased in	To reduce public complaints and	No complaints from the public about increased dust generation.	Inspection of complaints logbook.	Weekly	SHE Officer	SHE Officer> Exploration Manager	A logged complaint	Dust suppression around working areas

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

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
negatively affect occupational and residential respiratory health.	dust generation.	prevent negative changes in air quality due to exploration activities							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	SHE Officer	SHE Officer> Exploration Manager	A logged complaint	Servicing of vehicles and machinery by a certified service provider
<b>Poaching (Illegal hunting)</b>									
Illegal hunting of wildlife	Reported poaching incidents by projects team	To prevent illegal hunting of wildlife	Incidents reports of illegal hunting of wildlife by exploration workers.	Consultation with the local Police Service for reported incidents of poaching.	Weekly	SHE Officer	SHE Officer> Exploration Manager> local police service	An incidents report logged with the local Police Service	Appropriate action will be decided by the local Police Service
<b>Habitat loss (Biodiversity)</b>									
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	SHE Officer	SHE Officer> Exploration Manager	Vegetation clearance outside of marked areas.	Rehabilitation of affected areas to the satisfaction of the SHE Officer
<b>Health and safety</b>									



**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

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
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	SHE Officer and Exploration Manager	SHE Officer> Exploration 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	SHE Officer	SHE Officer> Exploration Manager > local police service	Outbreak of wildfires due to the exploration workers	Rehabilitation of affected areas
<b>Archaeology and cultural heritage</b>									
Potential disturbance of archaeological and cultural heritage resources	Presence or unearthing of archaeological or cultural heritage resources	To prevent destruction of artefacts and sites	Preservation of all artefacts and sites that are discovered within the site boundary or around the project site area	Inspection of records of findings	Daily	SHE Officer Operator	Operator>Foreman> Superintended>SHE Officer>Project Archaeologist>National Heritage Council (NHC)	Unearthing of archaeological or cultural heritage resources	Cease all activities on site and wait for NHC to inspect site and give further instructions / actions
<b>Employment creation</b>									
Creation of employment	Creation of employment opportunities	To ensure that locals benefit from the project	Number of locals employed during exploration activities	Inspection of employment records	Monthly	Exploration Manager	Project Manager or Proponent	Number of those employed	None
<b>Noise</b>									

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

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
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	SHE Officer	SHE Officer> Exploration Manager	A logged complaint about above normal noise levels	Revision of site activities
<b>Vehicular Traffic</b>									
Increase in traffic density on declared Roads Authority (RA) roads or damage to these.	Complaints from the public about increase in traffic on RA roads. Complaints about damage to RA roads caused by movement of project vehicles and machinery.	To ensure continued ease of access to RA roads by residents	No complaints from the public about increase off traffic due to exploration activities	Inspection of logbooks	Weekly	SHE Officer	SHE Officer> Exploration Manager > Roads Authority	A logged complaint about traffic increase or damage to RA roads	Find alternative access roads for the team. Rehabilitation of affected roads
<b>HIV and AIDS</b>									
Potential increase in HIV and AIDS prevalence.	New HIV or STIs infections	To prevent new infections in the area	No new HIV or STIs infections recorded	Liaison with local health facilities	Monthly	SHE Officer	SHE Officer> Exploration Manager > Ministry of Health and Social Services	Recorded new HIV or STIs linked to the exploration workers	Continued sex education and provision of condoms

**Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

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
<b>Social nuisance: Property invasion or disturbance and damage</b>									
Potential intrusion or damage/destruction of private or public properties	Unauthorized intrusion and or damage to properties	To prevent crashes and tensions between the Proponent and the land/property owners	No complaints of property damage or intruding by project personnel	Liaison with property owners or occupiers of land	Monthly	PRO	Exploration Manager (or Proponent)>PRO>Landowners/Occupiers of land	Arising new complaints	PRO to warn the personnel on respecting people's properties. If persists then Code of Conduct to be implemented
<b>Environmental Pollution (Littering)</b>									
Environmental pollution from solid waste during exploration activities.	Scattered litter	To prevent littering of the general project area	No visible litter around the project area	Visual observation	Daily	SHE Officer	SHE Officer> Exploration Manager	Visible littering around project site	Clean-up of the affected areas and ensuring exploration workers utilise waste containers provided.
<b>Visual</b>									
Visual impact owing to the project's exploration activities	Contrasting landscape (eyesore to travellers on the B2 road) and locals	To prevent and or reduce the appearance of contrasting land scars	Reduction of and insignificant (minor) contrasting landscape in the project site areas	Visual observation	Weekly	SHE Officer	SHE Officer> Exploration Manager	Major and very visible contrasting land scars on the site areas	Effective implementation of provided measures and continual improvements using other suitable visual

Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region

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
									mitigation measures. Ensuring that exploration works are only carried out on the targeted sites/spots of the EPL.
<b>Site Rehabilitation</b>									
Soil and land disturbance because of exploration activities.	Abandoned and stockpiled topsoil as well as very disturbed land surface	To prevent major soil and land damage by project activities	No major soil and land disturbance	Visual observation	Daily	SHE Officer	SHE Officer > Exploration Manager	Visible soil and land disturbance	Effective progressive backfilling of topsoil and rocks

## 5 RECOMMENDATIONS AND CONCLUSIONS

It is recommended that an Environmental Clearance Certificate be issued for the proposed exploration activities on EPL 7008, subject to the following recommendations:

- All required permits, licenses and approvals for the proposed activities should be obtained as required (please refer to the Permitting and Licensing Table 2 of this document (EMP). These include permits and licenses for land/farm access agreements to explore and ensuring compliance with these specific legal requirements.
- The management action plans in the EMP should be implemented and monitoring conducted as provided in **Table 3** and **Table 4**, respectively as well as the implementation of Archaeological Resources management measures indicated in **Appendix 1**.
- The Proponent complies with the legal requirements governing this type of project and its associated activities.
- All mitigations provided in this ESA Report and the management action plans in this EMP should be implemented and monitoring conducted as recommended.
- All the necessary environmental and social (occupational health and safety) precautions provided should be adhered to.
- Site areas where exploration activities have ceased should be rehabilitated, as far as practicable, to their original state.
- The monitoring of the implementation of mitigation measures should be conducted, applicable impact's actions taken, reporting done and recorded as recommended herein.

In conclusion, the effective implementation of the recommended management actions (mitigation measures) will see the significance reduction in impacts' significance (that cannot be avoided) from medium to low. It is therefore recommended that the Proponent and their contractors/employees effectively implement the recommended management plan actions (mitigation measures). Furthermore, to maintain low significance, the implementation of measures will need to be continuously monitored by the Proponent (or the SHE Officer). Monitoring will not only be carried out to maintain the low rating of impacts' significance but to also ensure that all potential impacts identified in this study and other impacts that might arise during project implementation are properly identified in time and addressed.

## APPENDIX 1: CHANCE FINDS PROCEDURE (AFTER KINAHAN, 2020)

Areas of proposed development activity 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.

### Responsibility:

<b>Operator:</b>	To exercise due caution if archaeological remains are found
<b>Foreman:</b>	To secure site and advise management timeously
<b>Superintendent</b>	To determine safe working boundary and request inspection
<b>Archaeologist</b>	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

## **Environmental Management Plan: Exploration Activities on EPL 7008 in the Erongo Region**

### 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.