



Excel Dynamic Solutions (Pty) Ltd

**ENVIRONMENTAL SCOPING ASSESSMENT (ESA) FOR THE PROPOSED BASE AND RARE METALS, DIMENSION STONE, INDUSTRIAL MINERALS, AND PRECIOUS METALS ON EXCLUSIVE PROSPECTING LICENSE (EPL) No. 9101 LOCATED NORTH-WEST OF UIS IN DOROB NATIONAL PARK IN ERONGO REGION.**

**ENVIRONMENTAL ASSESSMENT REPORT : FINAL**

**ECC APPLICATION NUMBER: APP- 003269**

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## **EXECUTIVE SUMMARY**

Albertina Itana (The Proponent) applied to be granted an Exclusive Prospecting Licence (EPL) No. 9101 by the Ministry of Mines and Energy (MME). The EPL cover a surface area of 1776.3414 hectares (ha), and it is located about 24 km South of Outjo settlement in the Kunene region and 110 km North-West of Uis in Dorob National Park in Erongo region (**Figure 1**).

The Proponent is interested in conducting exploration activities for **Base and Rare Metals, Dimension Stone, Industrial Minerals, and Precious Metals**.

Prospecting and exploration-related activities are among the listed activities that may not be undertaken without an ECC, under the Environmental Impact Assessment (EIA) Regulations. Therefore, to ensure that the proposed activity is compliant with the national environmental legislation, the project Proponent appointed an independent environmental consultant, Excel Dynamic Solutions (Pty) Ltd, to undertake the required Environmental Assessment (EA) process and apply for the ECC on their behalf.

## **PROJECT DESCRIPTION**

### **Planned Activities: Proposed Exploration Methods**

The Proponent intends to adopt a systematic prospecting and exploration approach to the project as follows:

- 1. Non-invasive Techniques:** Mainly include desktop study, geological mapping, lithology geochemical surveys and geophysical surveys.
- 2. Invasive Techniques:** Include drilling activities.

## **PUBLIC CONSULTATION**

The public consultation process assists the Environmental Consultant in identifying all potential impacts and aid in the process of identifying possible mitigation measures and alternatives to certain project activities. The communication with Interested and Affected Parties (I&APs) about the proposed prospecting and exploration activities was done through the following means and in this order to ensure that the public is notified and afforded an opportunity to comment on the proposed project:

- A Background Information Document (BID) containing brief information about the proposed exploration works was compiled and emailed to pre-identified I&APs, and upon request to all new registered I&APs;
- Project Environmental Assessment notices were published in The Namibian and New Era (9<sup>th</sup> April 2024 and 16<sup>th</sup> April 2024), briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- A consultation meeting was scheduled and held with the affected landowners on the 14<sup>th</sup> of May 2024 at Swakopmund Ministry of Environment, Forestry, and Tourism Office 09h00.

Issues or concerns raised during the public consultation meeting, and information obtained from the site visit and existing literature informed the ESA Report and EMP.

#### **Potential Impacts identified.**

The following potential impacts are anticipated:

- **Positive impacts:** Socio-economic development through employment creation and skills transfer; Opens up other investment opportunities and infrastructure-related development benefits; Produces a trained workforce and small businesses that can serve communities and may initiate related businesses; Boosts the local and regional economic development and; Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), equipment, and lubricants.
- **Negative impacts:** Potential disturbance of grazing land; Physical land/soil disturbance; Impact on local biodiversity (fauna and flora); Habitat disturbance and potential illegal wildlife and domestic hunting in the area; Potential impact on water resources and soils (pollution); Air quality issues: potential dust generation; Potential occupational health and safety risks, Vehicular traffic safety and impact on services infrastructures such as local roads, Vibrations, and noise associated with drilling activities may be a nuisance to locals; Archaeological and heritage impact and Potential social nuisance and conflicts.

The potential negative impacts were assessed, and mitigation measures were provided accordingly.

## **RECOMMENDATIONS**

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with effort and commitment towards monitoring the implementation of these measures.

It is, therefore, recommended that the proposed prospecting and exploration activities be granted an ECC, provided that:

- All the management and mitigation measures provided herein are effectively and progressively implemented.
- All required permits, licenses, and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use access agreements to explore and ensure compliance with these specific legal requirements.
- The Proponent and all their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Sites, where exploration activities have ceased, are rehabilitated, as far as practicable, to their pre-exploration state.
- Environmental Compliance monitoring reports should be compiled and submitted to the DEAF Portal as per the provision made on the MEFT/DEAF's portal.

## **Disclaimer**

Excel Dynamic Solutions (EDS) warrants that the findings and conclusion contained herein were accomplished in accordance with the methodologies set forth in the Scope of Work and Environmental Management Act (EMA) of 2007. These methodologies are described as representing good customary practice for conducting an EIA of a property for the purpose of identifying recognized environmental conditions. There is a possibility that even with the proper application of these methodologies there may exist the subject property conditions that could not be identified within the scope of the assessment, or which were not reasonably identifiable from the available information. The Consultant believes that the information obtained from the record review and during the public consultation processes concerning the proposed exploration work is

reliable. However, the Consultant cannot and does not warrant or guarantee that the information provided by the other sources is accurate or complete. The conclusions and findings set forth in this report are strictly limited in time and scope to the date of the evaluations. No other warranties are implied or expressed.

Some of the information provided in this report is based upon personal interviews, and research of available documents, records, and maps held by the appropriate government and private agencies. This report is subject to the limitations of historical documentation, availability, and accuracy of pertinent records, and the personal recollections of those persons contacted.

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2.5 billion and 541 million years ago (Goscombe et al., 2003). The Kaoko Belt is known for its complex tectonic history, involving multiple phases of deformation, metamorphism, and magmatism. The rocks in this area have been subjected to intense tectonic forces, resulting in folding, faulting, and the development of prominent mountain ranges (Goscombe et al., 2003). **Figure 5** below shows the general geology map for the project area..... 36

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

**Appendix C:** Curricula Vitae (CV) of the Environmental Assessment Practitioner (EAP)

**Appendix D:** Proof of Public Consultation (Newspaper advert, attendance register)

**Appendix F:** Intention to grant EPL 9101

## **LIST OF ABBREVIATIONS**

<b>Abbreviation</b>	<b>Meaning</b>
AMSL	Above Mean Sea Level
BID	Background Information Document
CV	Curriculum Vitae

DEAF	Department of Environmental Affairs and Forestry
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EDS	Excel Dynamic Solutions
ESA	Environmental Scoping Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
PPE	Personal Protective Equipment
Reg	Regulation
S	Section
TOR	Terms of Reference

## DEFINITION OF TERMS

<b>Alternative</b>	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
<b>Baseline</b>	Work done to collect and interpret information on the condition/trends of the existing environment.

<b>Biophysical</b>	That part of the environment that does not originate with human activities (e.g. biological, physical and chemical processes).
<b>Cumulative Impacts/Effects Assessment</b>	In relation to an activity, means the impact of an activity that in it may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.
<b>Decision-maker</b>	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal.
<b>Ecological Processes</b>	Processes which play an essential part in maintaining ecosystem integrity. Four fundamental ecological processes are the cycling of water, the cycling of nutrients, the flow of energy and biological diversity (as an expression of evolution).
<b>Environment</b>	As defined in the Environmental Management Act - the complex of natural and anthropogenic factors and elements that are mutually interrelated and affect the ecological equilibrium and the quality of life, including – (a) the natural environment that is land, water and air; all organic and inorganic matter and living organisms and (b) the human environment that is the landscape and natural, cultural, historical, aesthetic, economic and social heritage and values.
<b>Environmental Management Plan</b>	As defined in the EIA Regulations (Section 8(j)), a plan that describes how activities that may have significant environments effects are to be mitigated, controlled and monitored.
<b>Exclusive Prospecting Licence</b>	Is a license that confers exclusive mineral prospecting rights over land of up to 1000 km <sup>2</sup> in size for an initial period of three years, renewable twice for a maximum of two years at a time
<b>Interested and Affected Party (I&amp;AP)</b>	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity.
<b>Mitigate</b>	Practical measures to reduce adverse impacts.

<b>Significant impact</b>	Means an impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
<b>Fauna</b>	All of the animals that are found in a given area.
<b>Flora</b>	All of the plants found in a given area.
<b>Mitigation</b>	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment.
<b>Monitoring</b>	Activity involving repeated observation, according to a pre-determined schedule, of one or more elements of the environment to detect their characteristics (status and trends).
<b>Nomadic Pastoralism</b>	Nomadic pastoralists live in societies in which the husbandry of grazing animals is viewed as an ideal way of making a living and the regular movement of all or part of the society is considered a normal and natural part of life. Pastoral nomadism is commonly found where climatic conditions produce seasonal pastures but cannot support sustained agriculture.
<b>Proponent</b>	Organization (private or public sector) or individual intending to implement a development proposal.
<b>Public Consultation/Involvement</b>	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
<b>Protected Area</b>	Refers to a protected area that is proclaimed in the Government Gazette (according to the Nature Conservation Ordinance number 4 of 1975, as amended)

<b>Scoping</b>	An early and open activity to identify the impacts that are most likely to be significant and require specialized investigation during the EIA work. Can also be used to identify alternative project designs/sites to be assessed, obtain local knowledge of site and surroundings and prepare a plan for public involvement. The results of scoping are frequently used to prepare a Terms of Reference for the specialized input into full EIA.
<b>Terms of Reference (ToR)</b>	Written requirements governing full EIA input and implementation, consultations to be held, data to be produced and form/contents of the EIA report. Often produced as an output from scoping.

# 1 INTRODUCTION

## 1.1 Project Background

Albertina Itana (The Proponent) has applied to be granted an EPL No. 9101 by MME. The EPL covers a surface area of 23 711.8646 ha, and it is located about 110 North-West of Uis in the Dorob National Park Erongo region (**Figure 1**).

The Proponent is interested in conducting exploration activities for **Base and Rare Metals, Dimension Stone, Industrial Minerals, and Precious Metals**.

Section 27 (1) of the Environmental Management Act (EMA) (No. 7 of 2007) and its 2012 Environmental Impact Assessment (EIA) Regulations, provides a list of activities that may not be carried out without an EIA undertaken and an ECC obtained. Exploration activities are listed among activities that may not occur without an ECC. Therefore, no individuals or organizations may carry out exploration activities without an ECC awarded.

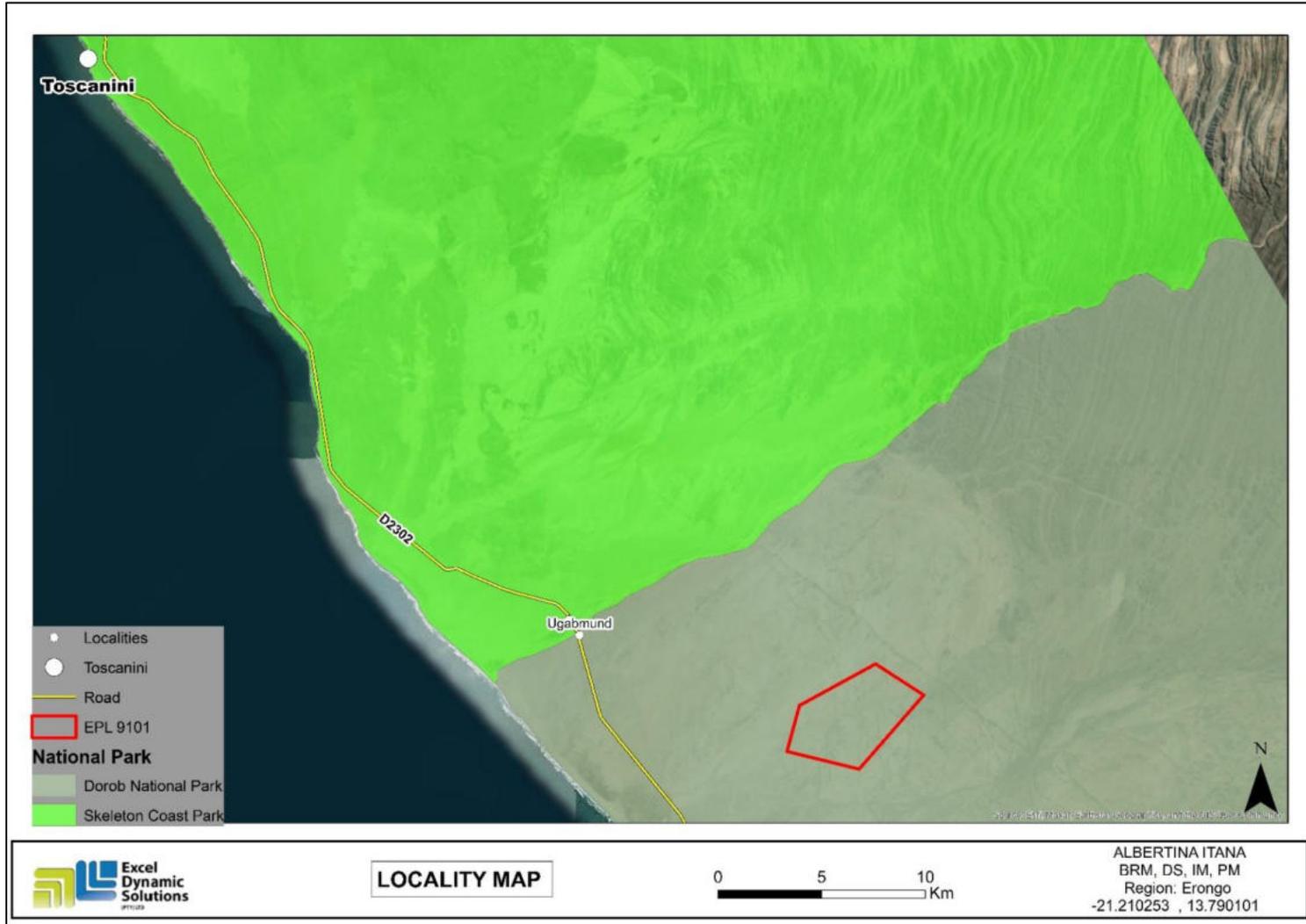


Figure 1: EPL 9101 Locality Map

## 1.2 Terms of Reference, Scope of Works and Appointed EA Practitioner

To satisfy the requirements of the EMA and its 2012 EIA Regulations, the Proponent appointed Excel Dynamic Solution Pty Ltd (EDS) to conduct the required EA process on their (Proponent's) behalf, and thereafter, apply for an ECC for exploration works on the EPL. There were no formal Terms of Reference (ToR) provided to EDS by the Proponent. The consultant, instead, relied on the requirements of the Environmental Management Act (No. 7 of 2007) (EMA) and its EIA Regulations (GN. No. 30 of 2012) to conduct the study.

The application for the ECC (**Appendix A**) is compiled and submitted to the Ministry of Environment, Forestry and Tourism (MEFT), the environmental custodian for project registration purposes. Upon submission of an Environmental Scoping Assessment (ESA) Report and Draft Environmental Management Plan (EMP) (**Appendix B**), an ECC for the proposed project may be considered by the Environmental Commissioner at MEFT, Department of Environmental Affairs and Forestry (DEAF).

The EIA project is headed by Mr. Nerson Tjelos, a qualified and experienced Geoscientist and experienced EAP. The consultation and reporting process was done by Mr. Mandume Leonard and reviewed by Mr. . Mr. Nerson Tjelos and Mr. Mandume Leonard's CVs are presented in **Appendix C**.

## 1.3 Motivation for the Proposed Project

The mining sector is one of the largest contributors to the Namibian economy. It contributes considerably to the improvement of local livelihoods. In Namibia, exploration for minerals is conducted mainly by the private sector. Exploration activities have a great potential to enhance and contribute to the development of other sectors, and its activities provide temporary employment and eventually contribute to generation of taxes that fund social infrastructure development. The minerals sector yields foreign exchange and accounts for a significant portion of gross domestic product (GDP). Additionally, the industry produces a trained workforce and small businesses that can serve communities and may initiate related businesses. Exploration fosters several associated activities such as manufacturing of exploration and mining equipment, and provision of engineering and environmental services. The mining sector forms a vital part of some of Namibia's development plans - Vision 2030, National Development Plan 5 (NDP5), and



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Harambee Prosperity Plans (HPPs) I and II. Mining is essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. Successful exploration on EPL 9101 would lead to the mining of the target mineral, which would contribute towards achieving the goals of the national development plans.

## **2 PROJECT DESCRIPTION: PROPOSED EXPLORATION ACTIVITY**

Prospecting and exploration for minerals are the first components of any potential mining project. These are carried out to acquire the necessary data required for further decision making and investment options. These activities are anticipated to last for about three years. The exploration process includes three phases: prospecting, exploration, and the decommissioning of works.

### **Prospecting Phase (Non- Invasive Techniques)**

#### **2.1.1 Desktop Study**

This mainly entails a desktop review of historical geological work done on the EPL, including regional mapping of the targeted district, acquisition of existing geophysical and geochemical data sets, familiarization with past studies of the project area and creating relationships with landowners and local authorities for land access.

#### **2.1.2 Geophysical surveys**

Geophysical surveys entail data collection of the substrata by air or ground, through sensors such as radar, magnetic and/or electromagnetic sensors, to detect and ascertain possible mineralization in the area. Ground geophysical surveys shall be conducted, where necessary, using vehicle-mounted sensors or handheld by staff members, while in the case of air-borne surveys, the sensors are mounted to an aircraft, which navigates over the target area.

#### **2.1.3 Lithology geochemical surveys**

Rock and soil samples shall be collected and taken for trace element analysis at analytical chemistry laboratories to determine the existence, the grade (concentration) and the regional extent of mineralization on the EPL. Additionally, trenches or pits may be dug depending on the commodity (in a controlled environment e.g., fencing off and labeling activity sites), using either manual techniques (jack hammers) or excavators to further investigate the mineral potential.

Soil sampling entails digging of small, about 20 cm deep pits along survey lines, where 1kg of sample material is extracted and sieved for finer grain-size to collect about 50g of very fine soil from it, representing the entire sample. As necessary, and to ensure adequate risk mitigation, all major excavations will be closed immediately after obtaining the needed samples, or the sites will

be secured until the trenches or pits are closed. The landowner and other relevant stakeholders will be engaged to obtain authorization where necessary.

## **2.2 Exploration Phase (Invasive Techniques)**

The selection of the potential mineralization model and exploration targets will be based on the local geology, and the trenching, drilling, and assay results of the samples collected. The planned exploration activities are aimed at delineating the mineral deposits and determining whether the deposits are economically feasible mining resources.

*No explosives will be used during the exploration phase.*

### **2.2.1 Detailed Exploration (Drilling)**

Should analyses by an analytical laboratory yield positive results, drilling targets are defined, drilled and subsurface samples collected for further analysis. This determines the depth of the potential mineralization. If necessary, new access tracks to the drill sites will be created and drill pads at which to set up the rig will be cleared. Two widely used drilling options may be adopted - the Reverse Circulation (RC) drilling method and/or the Diamond (Core) drilling method. The RC drilling method uses a pneumatic hammer, which drives a rotating tungsten-steel bit. RC Drilling produces an uncontaminated large volume sample, which comprises 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 RC drilling team is made up of 4-5 people (rig operator and assistants), a drilling rig carrying a compressor, a support truck with the drill pipes, 2-3 4x4 vehicles, and a water bowser. All geological samples and drill cores will be stored temporarily at the driller's field camp. This camp may also be used as a place to park and maintain field vehicles and includes storage facilities for fuel and lubricants.

Other aspects of the proposed exploration operations include:

### **2.2.2 Accessibility to Site**

The proposed project site is easily accessible via the a D 2302 road from Henties bay which connects to the trunk roads which transverse through the EPL. All project-related vehicles will use existing roads to access the EPL.

As far as practicable, all site particularly the basecamp and drilling sites shall be accessed through existing tracks. However, given that the project area is covered by vegetation, it is likely that new, but few tracks will be created to ensure easy access to drilling sites and/or exploration target areas. Additionally, it is highly recommended that motorized access is minimized as much as practically possible, especially during geological mapping, sampling, and geophysical surveys. Overall, all roads/track accessed by exploration vehicles must be limited to 5 vehicles when using existing tracks. All new access routes to the drilling sites should be identified, and agreed upon with the relevant stakeholders.

### **2.2.3 Material and Equipment**

The requirements of the exploration program in terms of vehicles and equipment include 4X4 vehicles, a drill rig, a drill pipe truck, water tanks, a diesel tank, a power generator, and a tented camp to accommodate the crew. Equipment and vehicles will be stored at a designated area near the accommodation site or a storage site established within the EPL area.

### **2.2.4 Services and Infrastructure**

- **Water:** Water for the exploration operations on the EPL, the proponent will drill boreholes for water within the EPL, upon obtaining necessary permits and signed agreements with the landowners in the area. The estimated monthly water consumption is at 4,500 liters. This includes water for drinking, sanitation, cooking, dust control (if necessary), drilling, as well as washing of equipment.
- **Power supply:** Power required during the operation phase will be provided by diesel generators. About 1500 liters of diesel will be used per day.
- **Fuel (diesel for generators and other equipment):** The fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer. Drip trays will be readily available and monitored to ensure that accidental fuel spills are cleaned up as soon as they have been detected/observed. Fuel may also be stored in a bunded diesel bowser on site, and in jerry cans placed on plastic sheeting to avoid unnecessary contamination of soils.

### **2.2.5 Waste Management**

The site will be equipped with secured waste bins for each type of waste (i.e., domestic, hazardous, and recyclable). Depending on the amount generated, waste will be sorted and collected as regularly as possible and taken to the nearest certified landfill site. An agreement will need to be reached with different waste management facility operators/owners and authorization or permits will be obtained prior to utilizing these facilities, in the case of the production of any hazardous waste.

- **Sanitation and human waste:** Appropriate portable ablution facilities will be provided, and the sewage waste will be disposed of according to the approved disposal or treatment methods of the facility manufacturer.
- **Hazardous waste:** Drip trays and spill control kits will be available on-site to ensure that oil/fuel spills and leaks from vehicles and equipment are captured timeously and contained correctly before polluting the site.

Waste produced on-site can also be categorized as mineral or non-mineral waste:

- **Mineral Waste:** Consists of solid products of exploration and mineral concentration to acquire the targeted minerals. Mineral waste will potentially be produced throughout the exploration phase. This waste will be stripped and dumped in allocated areas as stipulated in the EMP.
- **Non-mineral Waste:** Consists primarily of auxiliary materials that will support the exploration phase. This includes but is not limited to items such as empty containers, plastic, etc., and other domestic waste. This waste will be collected, sorted, and taken to the dumpsite as regularly as necessary.

### 2.2.6 Safety and Security

- **Storage Site:** Temporary storage areas for exploration material, equipment, and machinery will be required at the campsite and/or exploration sites. Security will be supplied on a 24-hour basis at the delegated sites for storage. A temporary support fence surrounding the storage site will be constructed to ensure people and domestic animals are not put at risk.
- **Fire management:** Basic firefighting equipment, i.e., fire extinguishers, will be readily available in vehicles, at the working sites and camps. The exploration crew is required to have the contact details of the nearest fire station at hand in case of a larger scale of fires at the site, in particular “veld” or bush fires, which can spread rapidly over large areas.

- **Health and Safety:** Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel while working at the site. A first aid kit will be readily available on-site to attend to potential injuries.

### **2.2.7 Accommodation**

The exploration crew/project personnel will be accommodated in a camp site, which will consist of tents, caravans, and/or make-shift buildings and temporary ablution facilities. This campsite will be set up near the exploration sites on the EPL. If the accommodation camp is to be set up on a farm, necessary arrangements will be made with the farm/landowner(s). Exploration activities will take place during daytime only and staff will commute between the exploration site(s) and their place of accommodation.

## **2.3 Decommissioning and Rehabilitation Phase**

Once the exploration activities on the EPL come to an end, the Proponent will need to put site rehabilitation measures in place. Decommissioning and rehabilitation are primarily reinforced through a decommissioning and rehabilitation plan, which consists of safety, health, environmental, and contingency aspects. An unfavorable economic situation or unconvincing exploration results might force the Proponent to cease the exploration program before the predicted closure. Therefore, it is best practice for the Proponent to ensure that the project activities cease in an environmentally friendly manner and the sites are rehabilitated.

### **3 PROJECT ALTERNATIVES**

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section highlights the different ways in which the project can be undertaken and identifies alternatives that may be the most practical, but least damaging to the environment.

Once the alternatives have been established, these are examined by asking the following three questions:

- What alternatives are technically and economically feasible?
- What are the environmental effects associated with the feasible alternatives?
- What is the rationale for selecting the preferred alternative?

#### **3.1 Types of Alternatives Considered**

##### **3.1.1 The "No-go" Alternative**

The “no action” alternative implies that the status quo remains. Should the proposal of exploration activities on the EPL be discontinued, none of the potential impacts (positive and negative) identified would occur. If the proposed project is to be discontinued, the current land use for the proposed site would remain unchanged.

This no-go option is considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative, is undertaken to establish what benefits might be lost if the project is not implemented. The key losses that may never be realized if the proposed project does not go ahead include:

- Loss of foreign direct investment.
- About ten (10) temporary job opportunities for community members will not be realized.
- No realization of local business support through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, accommodation and catering services, etc.

- Loss of potential income to the local and national government through land lease fees, license fees, and various tax structures.
- No improved geological understanding of the site area regarding the targeted commodities.
- Socio-economic benefits such as skills acquisition for local community members would be not realized.

Considering the above losses, the “no-action/go” alternative may not necessarily be considered a viable option for this project, although, in the case where parts of the project site are considered environmentally sensitive and/or protected, one or several sections of the site may be identified as no-go zones.

### **3.1.2 Exploration Location**

The prospecting/exploration location is dependent on the geological setting (regional and local), the economic geology, and the exploration and mining history of the EPL area. Therefore, finding an alternative location for the planned exploration activities is not possible. This means that the mineralization of the target commodities is area-specific, and exploration targets are primarily determined by the geology (host rocks) and the tectonic environment of the site (an ore-forming mechanism). The tenement has sufficient surface area for future related facilities, should an economic mineral deposit be defined.

Furthermore, the national mineral resources’ potential locations are also mapped and categorized by the Ministry of Mines and Energy, on exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licenses, reconnaissance licenses, and exclusive reconnaissance licenses. Available information on EPL 9101 (**Figure 2**), and other licenses are available on the Namibia Mines and Energy Cadastre Map Portal at <https://maps.landfolio.com/Namibia/>.

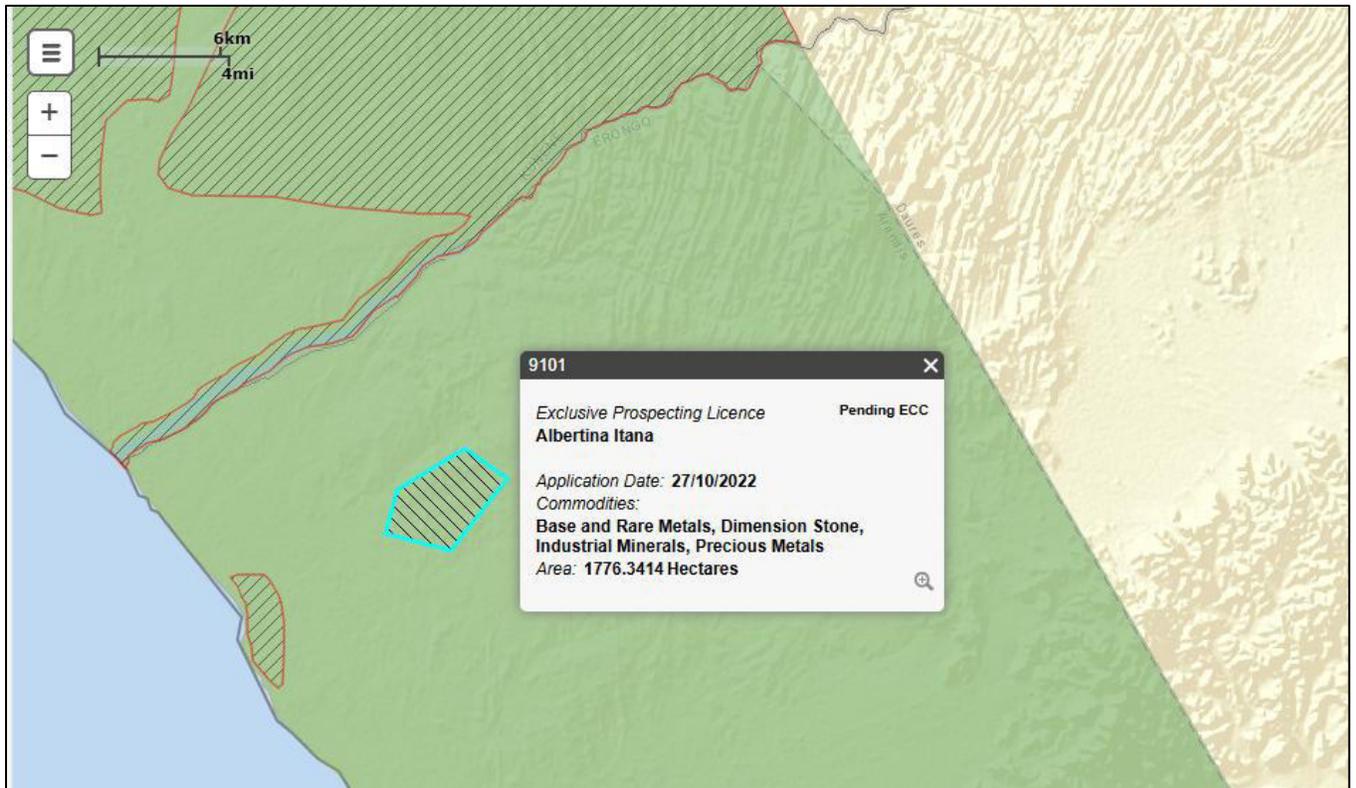


Figure 2: Location of EPL 9101 (National Mining Cadastre ( <https://maps.landfolio.com/Namibia/>))

### 3.1.3 Exploration Methods

Invasive and non-invasive exploration techniques are expected to be used for exploration works. If an economically viable discovery is made, the project will proceed to the mining phase upon approval of a mining ECC and issuance of a mining license. If any other alternative viable exploration methods are found to achieve the purpose more effectively and/or efficiently without aggravating any environmental measures put in place, they can be implemented. **Table 1** shows the exploration methods that will be employed during the exploration phase.

**Table 1: Alternatives (Exploration Methods)**

<b>Invasive Exploration Method (Alternatives Considered)</b>	<b>Process</b>	<b>Advantages</b>
<b>Pitting and trenching</b>	<p>-Pits and trenches can be a quick, cheap way of obtaining lithological and structural information in areas of shallow cover.</p> <p>-Pitting is usually employed to test shallow, extensive, flat-lying bodies of mineralization such as a buried heavy mineral placer.</p> <p>-The main advantage of pitting over a pattern-drill programme on the same deposit is that pits can provide a very large volume sample. Large sample sizes are necessary to overcome problems of variable grade distribution, which are a characteristic feature of such deposits.</p> <p>-Trenches are usually employed to expose steep dipping bedrock buried below shallow overburden and are normally</p>	<p>- Quick, cheap way of obtaining lithological and structural information in areas of shallow cover.</p> <p>-Pits can provide a very large volume sample. Large sample sizes are necessary to overcome problems of variable grade distribution, which are a characteristic feature of such deposits.</p> <p>-Trenches are an excellent adjunct to RC drilling programs, where the structural data from trench mapping are needed to complement the lithological information obtained from the drill cuttings (Marjoribanks, 1997).</p>



Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	dug across the strike of the rocks or mineral zone being tested (Marjoribanks, 1997).	
<b>Reverse Circulation (RC) Drilling</b>	<p>-Crushed rock is collected in the form of drill chips and powdered samples, brought to surface through the drilling rods by compressed air. This is in contrast to conventional drilling (Rotary Air Blow Drilling) that puts the air inside the rods and the cuttings outside. Here the air passes downwards through the annular space between the inner shaft and the outer tube.</p> <p>-Water is often used down the hole to cool the drill bit and reduce dust as well as assisting with the transportation of sample bits to the surface.</p> <p>-RC drilling is designed for drilling through and crushing hard rock.</p> <p>-RC drilling is fundamentally different from diamond drilling, both in terms of equipment and sampling. One major</p>	<p>-Compared to diamond drilling, RC requires less water. Therefore, RC drilling will put less pressure on water supply and use.</p> <p>The major differences between RC and diamond drilling are in the rate of penetration and cost per meter. RC drilling is much faster than diamond core drilling, and much less expensive.</p> <p>-Unlike diamond drilling, this process creates rock chips that can be analysed, rather than a solid, cylindrical piece of rock.</p>



Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	<p>difference is that RC drilling creates small rock chips instead of solid core.</p> <p>The RC method:</p> <ul style="list-style-type: none"> <li>-Allows full recovery of samples continuously</li> <li>-Quick installation</li> <li>-There is no contact between the walls and cuttings taken at the bottom.</li> <li>-The penetration rate is fast (Technidrill, 2020)</li> </ul>	<p>-Some types of information, such as structural details, are not possible to obtain in the absence of solid rock. Despite this disadvantage, much valuable information can still be obtained from the rock chips. For example, the chips are much easier to examine under a microscope. Testing of fluorescence and effervescence are easily accomplished (Earth Science Australia, 2020).</p>
<p><b>Infill drilling</b></p>	<p>The progress of an exploration project mostly depends on the result of the primary boreholes. Therefore, primary exploration boreholes must intersect high-grade mineralization zones with considerable thickness. On the other hand, the infill boreholes are designed based on obtained results from the primary boreholes (Fatehi, <i>et al.</i>, 2017). Therefore, infill drilling is intended to support an</p>	<p>It is for these reasons that RC will be the most preferred method and is mainly used. However, RC drilling would be combined with Diamond drilling where necessary for more reliable data collection and analysis. Diamond drilling would be more applicable where deeper holes are required than is possible using RC drilling. In-fill drilling</p>



Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	<p>update to a higher classification of the Mineral Resource estimate. The metallurgical test-work results will improve understanding of blending designs in the exploration schedules for the product offtake specifications (Canyon Resources, 2021).</p>	<p>would also be applied to support an update to a higher classification of the Mineral Resources estimate.</p>
<p><b>Diamond drilling (Core)</b></p>	<p>-Diamond drilling uses a diamond bit, which rotates at the end of a drill rod (or pipe). The opening at the end of the diamond bit allows a solid column of rock to move up into the drill pipe and be recovered at the surface.</p> <p>-The diamond bit is rotated slowly with gentle pressure while being lubricated with water (“mud circulation”) to prevent overheating. As a result, this drilling method is known to use a huge amount of water compared to RC, thus may put pressure on water supply sources.</p> <p>- Drill cuttings obtained with RC drilling can be analysed directly to provide a limited amount of information, and their locations are less precise. Core samples, on the other hand, will identify actual veins of materials and give you their</p>	



Invasive Exploration Method (Alternatives Considered)	Process	Advantages
	<p>precise location (BG Drilling, 2016). Therefore, for accuracy's sake, diamond drilling would provide better result. In other words, RC results are reliable but may not be accurate.</p> <ul style="list-style-type: none"><li>- As diamond is one of the strongest materials in the world, it has no trouble drilling through most surfaces. Therefore, it works well across a wider range of ground types and conditions.</li><li>-Time-consuming and more effort is required to obtain the drill core. Low initial investment, but generally more expensive to meters drilled because of the limitation of the speed.</li></ul>	

The final drilling technique would be determined by the mineralization type. However, based on the information presented in the Table above regarding the detailed exploration methods, it was found and pre-determined that Reverse Circulation (RC) drilling would be preferable as much as possible given its efficiency in terms of costs, operating speed and environmental friendliness (water demand), compared to Diamond drilling.

Although RC drilling is known to have its shortcomings, particularly the lack of solid drill recovery and inaccuracy, it is usually combined with Diamond drilling for the exploration of some minerals, if the borehole(s) needs to be deeper than what RC can achieve

## 4 LEGAL FRAMEWORK: LEGISLATION, POLICIES, AND GUIDELINES

Prospecting and exploration activities have legal implications associated with certain applicable legal standards. A summary of applicable and relevant international policies and Namibian legislation, policies, and guidelines for the proposed development is given in this section (**Table 2**). This summary serves to inform the project Proponent, I&APs, and the decision-makers at the DEAF, of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled to establish the proposed prospecting and exploration activities.

### 4.1 The Environmental Management Act (No. 7 of 2007)

This EIA is carried out according to the Environmental Management Act (EMA) and its Environmental Impact Assessment (EIA) Regulations (GG No. 4878 GN No. 30).

The EMA has stipulated requirements to complete the required documentation to obtain an ECC for permission to undertake certain listed activities. These activities are listed under the following Regulations:

*3.1 The construction of facilities for any process or activities that requires a license, right of other forms of authorization, and the renewal of a license, right, or other forms of authorization, in terms of the Minerals (Prospecting and Mining Act, 1992).*

*3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.*

*3.3 Resource extraction, manipulation, conservation, and related activities.*

The Environmental Impact Assessment (EIA) Regulations GN 28-30 (GG 4878) detail requirements for public consultation within a given environmental assessment process (GN 30 S21). The EIA regulations also outline the required details of a Scoping Report (GN 30 S8) and an Assessment Report (GN 30 S15).

Other legal obligations that are relevant to the proposed activities of EPL 9101 and related activities are presented in **Table 2**.



**Table 2: Applicable Legal Standards, Policies and Guidelines**

<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<p>The Constitution of the Republic of Namibia, 1990 as amended:</p> <p><b>Government of the Republic of Namibia</b></p>	<p>The Constitution of the Republic of Namibia (1990 as amended) addresses matters relating to environmental protection and sustainable development. Article 91(c) defines the functions of the Ombudsman to include:</p> <p>“...the duty to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia...”</p> <p>Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the:</p> <p>“...Natural resources situated in the soil and on the subsoil, the internal waters, in the sea, in the continental shelf, and in the exclusive economic zone are property of the State.”</p>	<p>By implementing the environmental management plan, the establishment will be conformant to the constitution in terms of environmental management and sustainability.</p> <p>Ecological sustainability will be the main priority for the proposed development.</p>
<p>Minerals (Prospecting and</p>	<p>Section 52 requires mineral license holders to enter into a written</p>	<p>The Proponent should enter into a written agreement with</p>



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<p>Mining) Act (No. 33 of 1992): <b>Ministry of Mines and Energy (MME)</b></p>	<p>agreement with affected landowners before exercising rights conferred upon the license holder.</p> <p>Section 52(1) clarifies that a mineral license holder may not exercise his/her rights in any town or village, on or in a proclaimed road, land utilized for cultivation, within 100m of any water resource (borehole, dam, spring, drinking trough, etc.) and boreholes, or no operations in municipal areas, etc.), which should individually be checked to ensure compliance.</p> <p>Section 54 requires a written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area.</p> <p>Section 68 stipulates that an application for an exclusive prospecting license (EPL) shall contain the particulars of the condition of and any existing damage to, the environment in the area to which the application relates and an estimate of the effect which the proposed prospecting operations may have on the environment and the measures to be</p>	<p>landowners before carrying out exploration on their land.</p> <p>An assessment of the impact on the receiving environment should be carried out.</p> <p>The Proponent should include as part of their application for the EPL, measures by which they will rehabilitate the areas where they intend to carry out mineral exploration activities.</p> <p>The Proponent may not carry out exploration activities within the areas limited by Section 52 (1) of this Act.</p>



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
	<p>taken to prevent or minimize any such effect.</p> <p>Section 91 requires that rehabilitation measures should be included in an application for a mineral license.</p>	
<p>Nature Conservation Amendment Act, No. 3 of 2017: <b>Ministry of Environment, Forestry and Tourism (MEFT)</b></p>	<p>National Parks are established and gazetted in accordance with the Nature Conservation Ordinance, 1975 (4 of 1975), as amended. The Ordinance provides a legal framework with regard to the permission to enter a state-protected area, as well as requirements for individuals damaging objects (geological, ethnological, archaeological, and historical) within a protected area. Though the Ordinance does not specifically refer to mining as an activity within a protected area (PA) or recreational area (RA), it does restrict access to PA's and prohibits certain acts therein as well as the purposes for which permission to enter game parks and nature reserves may be granted.</p>	<p>The Proponent will be required to enhance the conservation of biodiversity and the maintenance of the ecological integrity of protected areas and other State land in the Project Site area.</p>
<p>The Parks and Wildlife Management Bill of 2008: <b>Ministry of Environment,</b></p>	<p>Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous</p>	



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<b>Forestry and Tourism (MEFT)</b>	biological resources, and the management of protected areas, to conserve biodiversity and contribute to national development.	
Mine Health & Safety Regulations, 10th Draft: <b>Ministry of Health and Social Services (MHSS)</b>	Makes provision for the health and safety of persons employed or otherwise present in mineral license areas. These deal with among other matters; clothing and devices; design, use, operation, supervision, and control of machinery; fencing and guards; and safety measures during repairs and maintenance.	The Proponent should comply with all relevant regulations with respect to their employees.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001): <b>Ministry of Mines and Energy (MME)</b>	Regulation 3(2)(b) states that “No person shall possess [sic] or store any fuel except under the authority of a license or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 liters or less in any container kept at a place outside a local authority area”	The Proponent should obtain the necessary authorization from the MME for the storage of fuel on-site.
The Regional Councils Act (No. 22 of 1992): <b>Ministry of Urban and Rural</b>	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning perspective, their duties include, as described in section 28 “to undertake the planning of the	The relevant Regional Councils are IAPs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the Erongo



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<b>Development (MURD)</b>	<p>development of the region for which it has been established with a view to physical, social and economic characteristics, urbanization patterns, natural resources, economic development potential, infrastructure, land utilization pattern and sensitivity of the natural environment.</p>	<p>Regional Council; therefore, they should be consulted.</p>
<p>Water Act 54 of 1956: <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b></p>	<p>The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force:</p> <p>It prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duty of care to prevent pollution (S3 (k)).</p> <p>The Act provides for the control and protection of groundwater (S66 (1), (d (ii)).</p> <p>It also regulates liability for clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).</p>	<p>The protection (quality and quantity/abstraction) of water resources should be a priority.</p> <p>The permits and license required thereto should be obtained from MAWLR's relevant Departments (these permits include Borehole Drilling Permits, Groundwater Abstraction &amp; Use Permits, and when required, Wastewater / Effluent Discharge Permits).</p>
<p>Water Resources Management Act (No 11 of 2013): <b>Ministry of Agriculture,</b></p>	<p>The Act provides for the management, protection, development, use, and conservation of water resources; provides for the regulation and monitoring of water services, and</p>	



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<b>Water and Land Reform (MAWLR)</b>	<p>provides for incidental matters. The objects of this Act are to:</p> <p>Ensure that the water resources of Namibia are managed, developed, used, conserved, and protected in a manner consistent with, or conducive to, the fundamental principles set out in Section 66 - protection of aquifers, Subsection 1 (d) (iii) provide for preventing the contamination of the aquifer and water pollution control (S68).</p>	
<p>National Heritage Act No. 27 of 2004: <b>Ministry of Education, Arts and Culture (MEAC)</b></p>	<p>To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.</p>	<p>The Proponent should ensure compliance with this act's requirements. The necessary management measures and related permitting requirements must be taken. This is to be done by consulting with the National Heritage Council (NHC) of</p>
<p>The National Monuments Act (No. 28 of 1969): <b>Ministry of Education, Arts and Culture (MEAC)</b></p>	<p>The Act enables the proclamation of national monuments and protects archaeological sites.</p>	<p>Namibia. The management measures should be incorporated into the Draft EMP.</p>



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
Soil Conservation Act (No 76 of 1969): <b>Ministry of Agriculture, Water and Land Reform (MAWLR)</b>	The Act makes provision for the prevention and control of soil erosion and the protection, improvement, and conservation of soil, vegetation,, and water supply sources and resources, through directives declared by the Minister.	Duty of care must be applied to soil conservation and management measures must be included in the EMP.
Forestry Act (Act No. 12 of 2001: <b>Ministry of Environment, Forestry and Tourism (MEFT)</b>	The Act provides for the management and use of forests and forest products.  Section 22. (1) provides: “Unless otherwise authorized by this Act, or by a license issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or a gully unless the cutting, destruction or removal is done for the purpose of stabilizing the sand or gully; or (b) any living tree, bush or shrub growing within 100 m of a river, stream or watercourse.”	The proponent will apply for the relevant permit under this Act if it becomes necessary.
Public Health Act (No. 36 of 1919): <b>Ministry of Health</b>	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in	The Proponent and all its employees should ensure compliance with the



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<b>and Social Services (MHSS)</b>	charge any nuisance or other condition liable to be injurious or dangerous to health.”	provisions of these legal instruments.
Health and Safety Regulations GN 156/1997 (GG 1617): <b>Ministry of Health and Social Services (MHSS)</b>	Details various requirements regarding the health and safety of labourers.	
Public and Environmental Health Act No. 1 of 2015: <b>Ministry of Health and Social Services (MHSS)</b>	The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are designed and operated in a way that is safe, or not injurious or dangerous to public health, and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels.  Public and environmental health should be preserved and remain uncompromised.
Atmospheric Pollution Prevention Ordinance (1976):	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of	The proposed project and related activities should be undertaken in such a way that they do not pollute or



<b>Legislation / Policy / Guideline: Custodian</b>	<b>Relevant Provisions</b>	<b>Implications for this project</b>
<b>Ministry of Health and Social Services (MHSS)</b>	Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	compromise the surrounding air quality. Mitigation measures should be put in place and implemented on-site.
Hazardous Substance Ordinance, No. 14 of 1974: <b>Ministry of Health and Social Services (MHSS)</b>	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal, and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.	The Proponent should handle and manage the storage and use of hazardous substances on site so that they do not harm or compromise the site environment.
Road Traffic and Transport Act, No. 22 of 1999: <b>Ministry of Works and Transport (Roads Authority of Namibia)</b>	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the Proponent wish to undertake activities involving road transportation or access to existing roads, the relevant permits will be required.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant necessary permits must be applied for.
Labour Act (No. 6 of 1992): <b>Ministry of Labour,</b>	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations	The Proponent should ensure that the prospecting and exploration activities do not

Legislation / Policy / Guideline: Custodian	Relevant Provisions	Implications for this project
Industrial Relations and Employment Creation (MLIREC)	through promoting social justice, occupational health and safety, and enhanced labour market services for the benefit of all Namibians. This ministry ensures effective implementation of the Labour Act No. 6 of 1992.	compromise the safety and welfare of workers.

#### 4.2 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are listed in **Table 3** below.

**Table 3: International Policies, and Principles**

Statute	Provisions	Project Implications
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The principles apply to all new project financings globally across all sectors.	These principles are an attempt to: ‘...encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based



Statute	Provisions	Project Implications
	<p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p> <p>Principle 5: Stakeholder Engagement</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting</p> <p>Principle 10: Reporting and Transparency</p>	<p>upliftment and empowering interactions.'</p>
<p><b>The International Finance Corporation (IFC) Performance Standards</b></p>	<p>The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's</p>	<p>The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement</p>



Statute	Provisions	Project Implications
	<p>commitments, roles, and responsibilities related to environmental and social sustainability.</p> <p>As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p> <p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p> <p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African</p>	<p>and disclosure obligations of the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.</p>



Statute	Provisions	Project Implications
	<p>Historically Underserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p> <p>Performance Standard 9: Financial Intermediaries (FIs)</p> <p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from</p> <p><a href="http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1">http://www.worldbank.org/en/projects-operations/environmental-and-social-standards?cq_ck=1522164538151#ess1</a></p>	
<p><b>The United Nations Convention to Combat Desertification (UNCCD) 1992</b></p>	<p>Addresses land degradation in arid regions with the purpose of contributing to the conservation and sustainable use of biodiversity and the mitigation of climate change.</p> <p>The convention's objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability (United Nations Convention).</p>	<p>The project activities should not be such that they contribute to desertification.</p>



Statute	Provisions	Project Implications
<b>Convention on Biological Diversity 1992</b>	<p>Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.</p> <p>Promote the protection of ecosystems, and natural habitats, and the maintenance of viable populations of species in natural surroundings.</p>	<p>Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimized.</p>
<b>Stockholm Declaration on the Human Environment, Stockholm (1972)</b>	<p>It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.</p>	<p>Protection of natural resources and prevention of any form of pollution.</p>

**Relevant international Treaties and Protocols ratified by the Namibian Government**

- Convention on International Trade and Endangered Species of Wild Fauna and Flora (CITES), 1973.
- Convention on Biological Diversity, 1992.
- World Heritage Convention, 1972.

## 5 ENVIRONMENTAL BASELINE

The proposed exploration program will be undertaken in specific environmental and social conditions. Understanding the pre-project conditions of the environment will aid in providing background "information" on the status quo and future projections of environmental conditions after proposed works on the EPL. This also helps the EAP in identifying the sensitive environmental features that may need to be protected through the recommendations and effective implementation of mitigation measures provided.

The baseline information presented below is sourced from a variety of sources including reports of studies conducted around the area of Henties bay, and Uis Erongo Region. Further information was obtained by the Consultant during the site visit.

### 5.1 Biophysical Environment

#### 5.1.1 Climate

Climate has a major influence on the exploration activities proposed on the EPL. An understanding of climatic conditions helps to determine the appropriate and/or inappropriate times to conduct exploration activities.

The project area climate is classified as a local steppe. The months February, March, and April experiences maximum temperature of 21.2°C. August, and September months experiences minimum temperature of an average temperature of 10.16°C. The project area is characterized by a desert climate. There is virtually no rainfall all year long in the area. This climate is considered to be BWk according to the Köppen-Geiger climate classification.. **Figure 3** below shows the climatic conditions for the project area.



	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	18.4 °C (65.1) °F	19 °C (66.1) °F	18.8 °C (65.8) °F	18.2 °C (64.7) °F	16.9 °C (62.4) °F	16.1 °C (61) °F	16.1 °C (60.9) °F	14.1 °C (57.3) °F	13.9 °C (57) °F	14.7 °C (58.5) °F	16 °C (60.8) °F	17.2 °C (63) °F
Min. Temperature °C (°F)	16.3 °C (61.4) °F	17 °C (62.5) °F	16.5 °C (61.7) °F	15.5 °C (59.9) °F	13.6 °C (56.5) °F	12.4 °C (54.3) °F	12.2 °C (53.9) °F	10.7 °C (51.3) °F	10.9 °C (51.7) °F	12 °C (53.6) °F	13.3 °C (55.9) °F	14.8 °C (58.7) °F
Max. Temperature °C (°F)	20.9 °C (69.6) °F	21.4 °C (70.6) °F	21.5 °C (70.7) °F	21.1 °C (70) °F	20.4 °C (68.8) °F	20.3 °C (68.6) °F	20.4 °C (68.8) °F	17.6 °C (63.7) °F	17.1 °C (62.8) °F	17.7 °C (63.9) °F	18.9 °C (66.1) °F	19.9 °C (67.9) °F
Precipitation / Rainfall mm (in)	7 (0)	10 (0)	4 (0)	3 (0)	1 (0)	1 (0)	1 (0)	1 (0)	2 (0)	2 (0)	2 (0)	4 (0)
Humidity(%)	84%	84%	82%	78%	72%	63%	60%	73%	81%	82%	82%	83%
Rainy days (d)	1	1	1	0	0	0	0	0	0	0	0	0
avg. Sun hours (hours)	7.2	7.3	7.5	7.9	7.8	8.1	8.2	7.3	6.7	6.9	7.5	7.5

(source: <https://en.climate-data.org>)

Figure 3: Shows the climate graph for the project area

### 5.1.2 Landscape and Topography

The EPL is dominated by the Central Western Plains landscape, and it is characterized by vast open plains with scattered vegetation, and dominated by grasses and shrubs adapted to arid conditions. This landscape is part of the Namib Desert, one of the driest desert in Africa and is characterized by its sparse vegetation and unique geological formations (UNESCO, n.d.). The plains are interspersed with rocky outcrops and inselbergs, with isolated hills or mountains that rise abruptly from the surrounding plain. These geological features are composed of ancient granite and offer stunning views of the surrounding desert landscape (UNESCO, n.d.).

The Central Western Plains Landscape is also home to a variety of desert-adapted wildlife, including oryx, springbok, and various species of birds and reptiles. The area is known for its unique flora and fauna, which have adapted to survive in the harsh desert environment (UNESCO, n.d.). The elevation of the project area is between 37 m and 119 m.

, **Figure 4** below shows the landscape and the topography map of the project area.

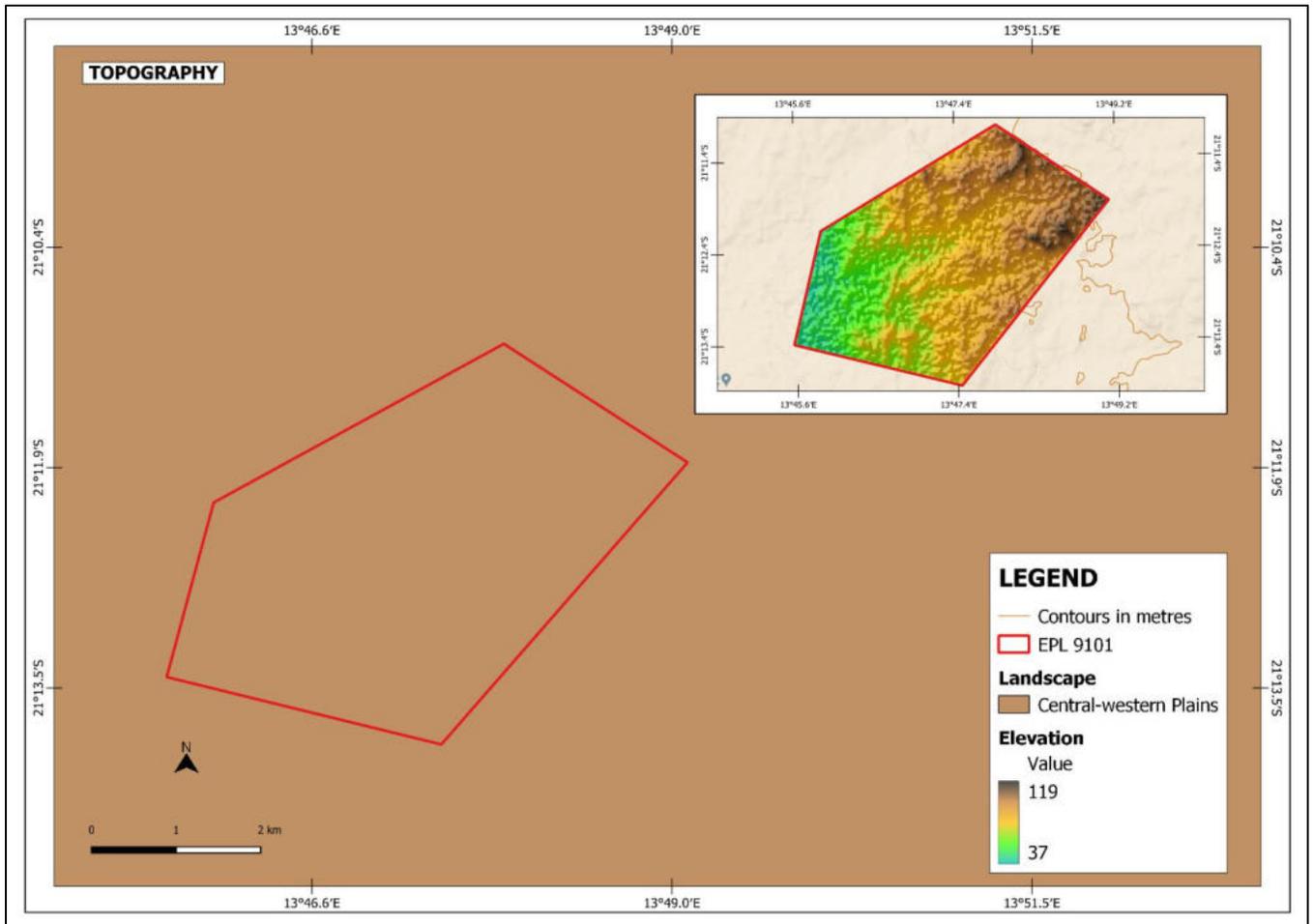


Figure 4: The Topography and landscape map for the project area

## 5.1.2 Geology

The project area geology is characterized by the presence of the Kaoko Belt, which is part of the larger Damara Orogen. This region consists of high-grade metamorphic rocks, including gneisses, schists, and marbles, which were formed during the Proterozoic Eon, between 2.5 billion and 541 million years ago (Goscombe et al., 2003). The Kaoko Belt is known for its complex tectonic history, involving multiple phases of deformation, metamorphism, and magmatism. The rocks in this area have been subjected to intense tectonic forces, resulting in folding, faulting, and the development of prominent mountain ranges (Goscombe et al., 2003). **Figure 5** below shows the general geology map for the project area.

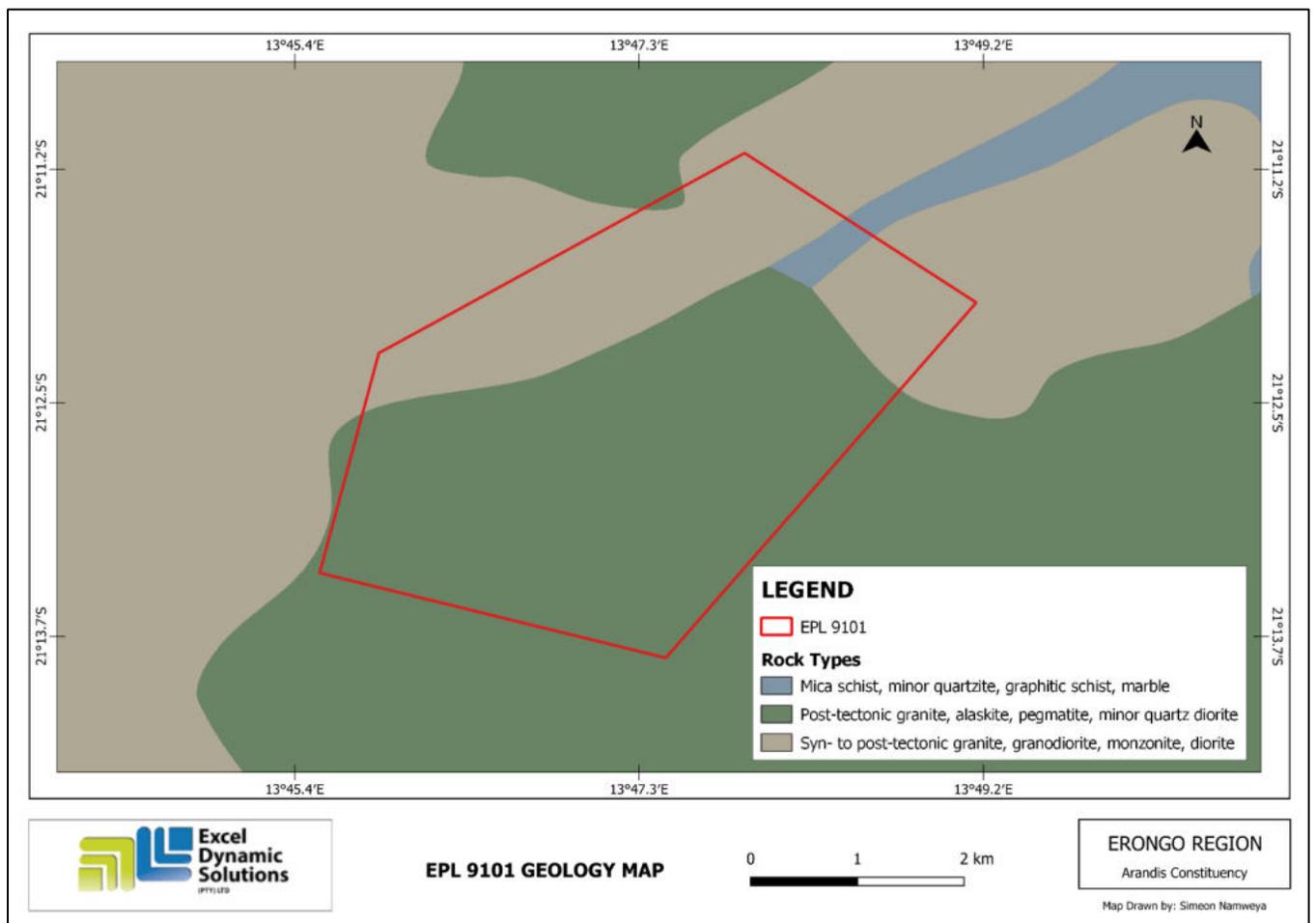


Figure 5: General Geology map for EPL 9101

### 5.1.3 Soil

The project area is dominated by the Petric Gypsisols soil type. Gypsisols are soils characterized by a significant accumulation of gypsum (calcium sulfate), often found in arid and semi-arid regions. Gypsisols form through the precipitation of gypsum from soil water as it evaporates. These soils typically have a high salt content and can form a hard, cemented layer, which can restrict root growth and water infiltration. They are often associated with sparse vegetation and are generally not suitable for agriculture without significant soil management and amendment (IUSS Working Group WRB, 2015). **Figure 6** below shows the soil map covering the EPL area and **Figure 7** shows the soil observed onsite.

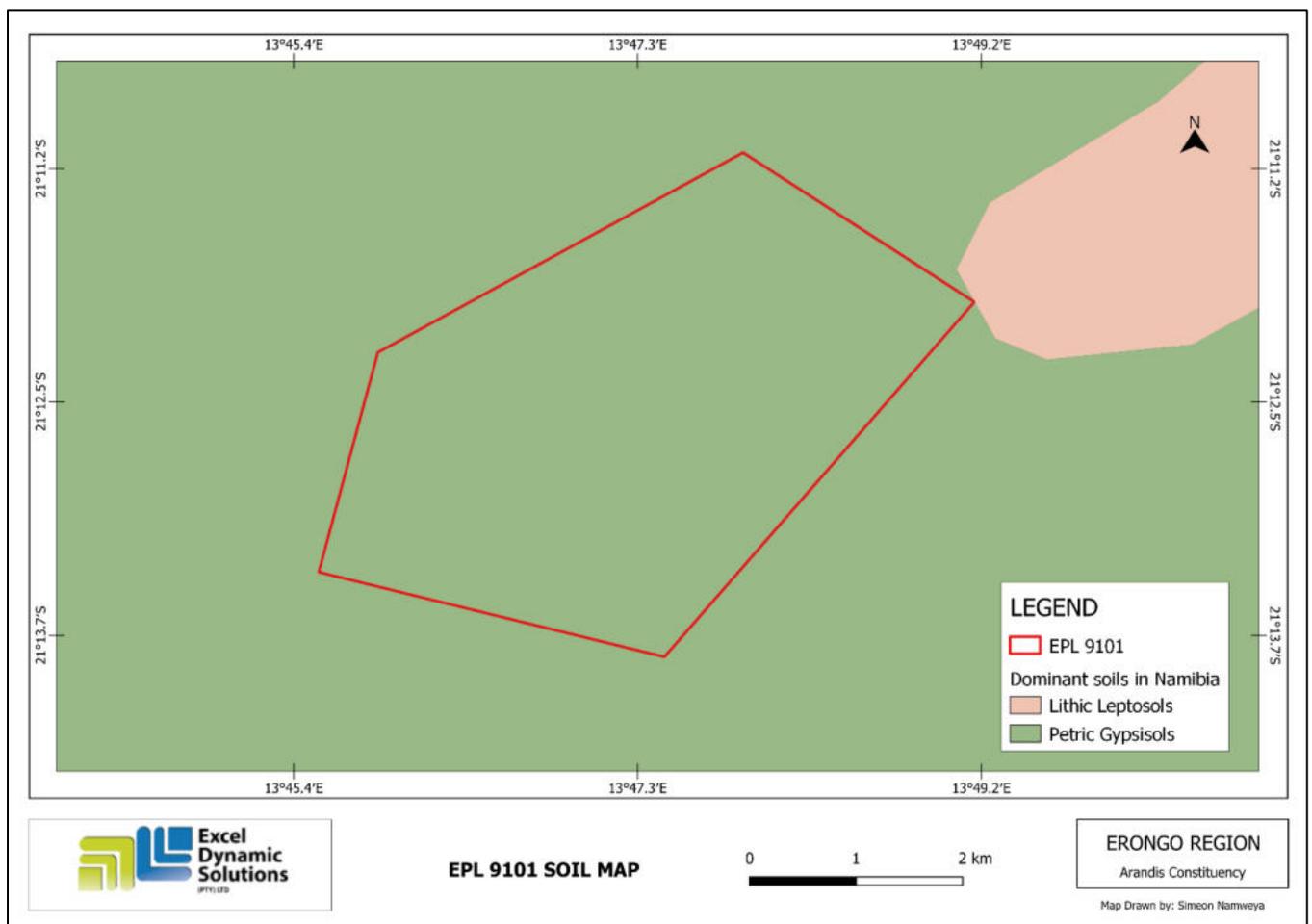


Figure 6: Soils map for EPL 9101



**Figure 7: Shows the soil types observed on the EPL area**

### 5.1.4 Hydrology, Groundwater Vulnerability to Pollution, and Water Resources

The EPL area is dominated by the Rock bodies with little groundwater potential aquifer. The rock formation have limited capacity to store or transmit significant amounts of groundwater and mainly consist of dense, impermeable rock types such as granite, gneiss, or schist, which do not allow water to easily flow through them (Freeze & Cherry, 1979).

The groundwater vulnerability of the project area is rated as low. **Figure 7** shows the hydrological map for the project area.

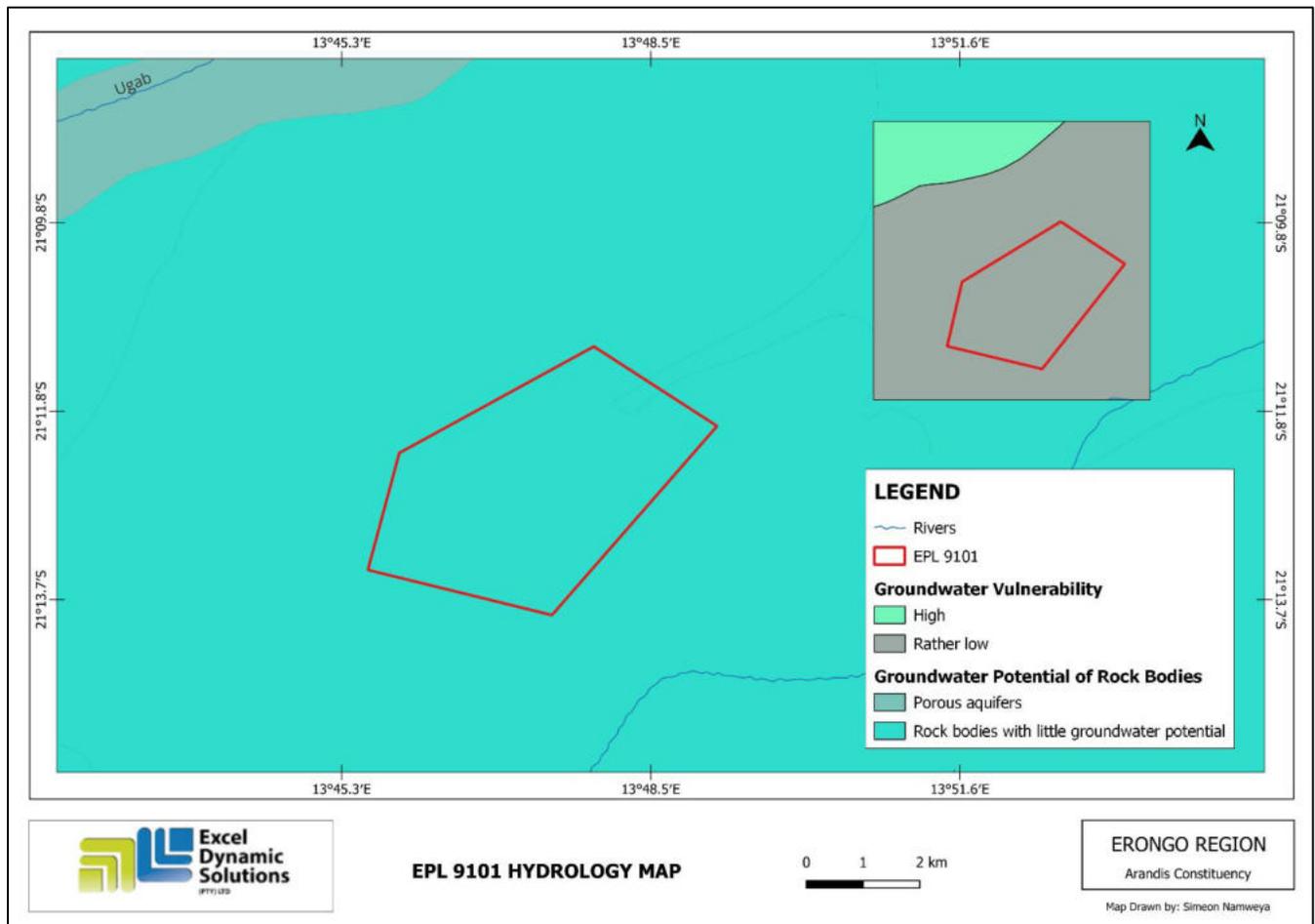


Figure 8: Hydrology map for EPL 9101

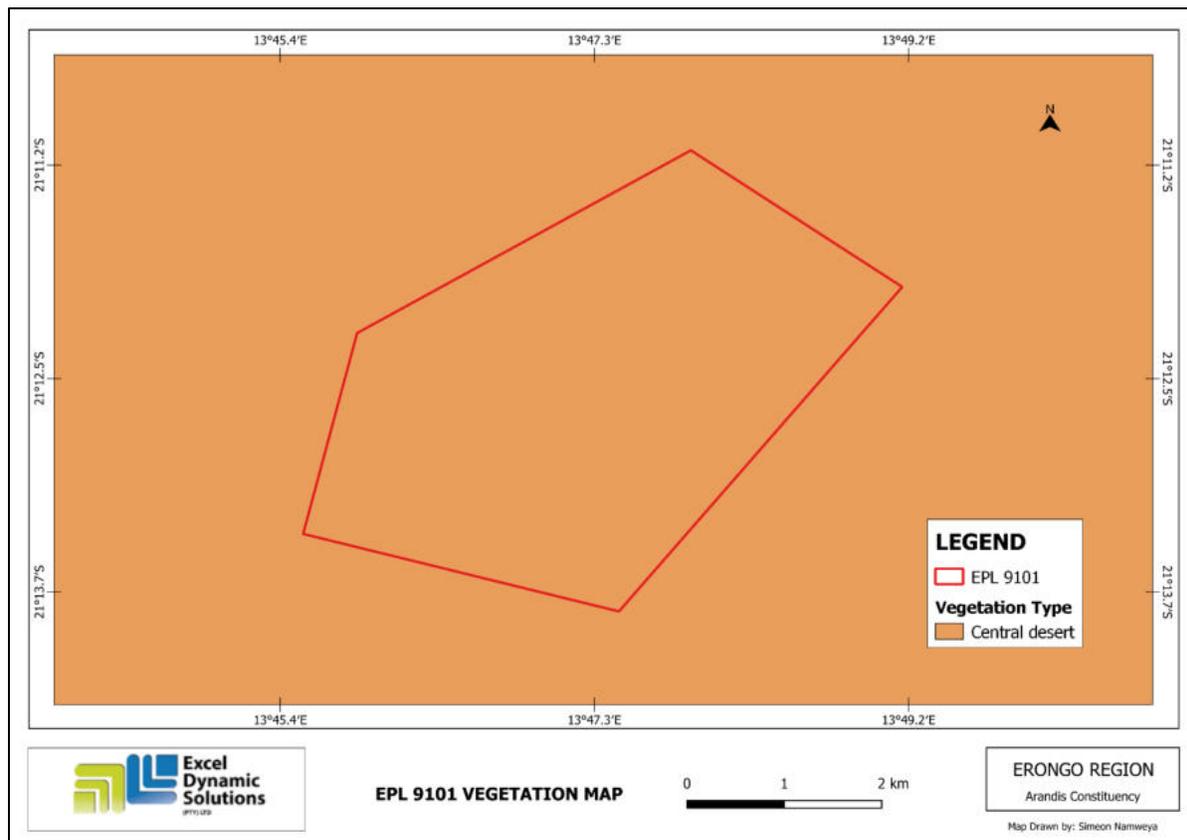
## 5.1.5 Flora and Fauna

### 5.1.5.1 Flora

The project area is generally dominated by the central desert. This region is characterized by hyper-arid conditions, sparse vegetation, and extensive dune fields (Mendelsohn et al., 2002). The Central Desert features vast gravel plains, rocky outcrops, and isolated mountains, providing a stark and rugged landscape. Vegetation in the Central Desert is extremely limited due to the low and unpredictable rainfall, typically less than 100 mm annually. The flora consists mainly of drought-resistant species like lichens, succulents, and some grasses.

**The recommendation measures/ mitigation measures stipulated in the EMP must be adhered to, regarding the removal of protected plants on site. Deemed they fall under the exploration target points.**

**Figure 9** shows the vegetation map around the project area and **Figure 10** shows the plant types that were seen during the site visit.



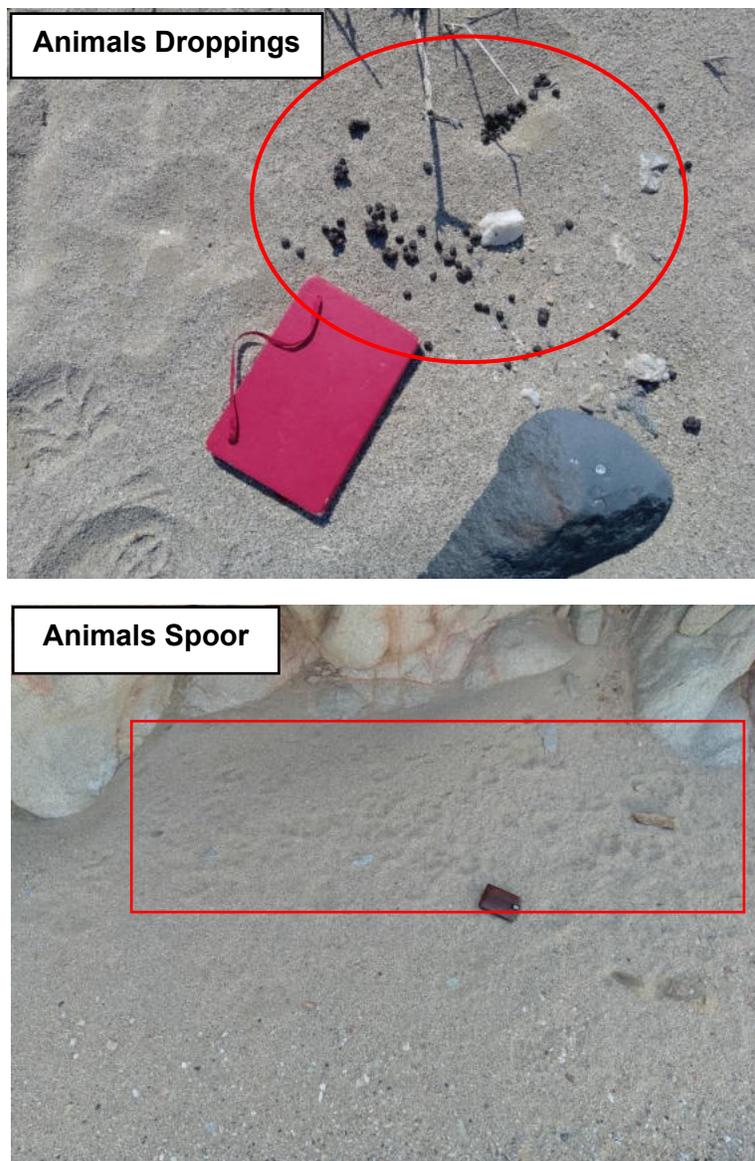
**Figure 9 : Vegetation map - EPL 9101**



Figure 10 : The typical vegetation found within the EPL

### 5.1.5.2 Fauna

The Project area falls within national park land with (Dorob National park) and host wildlife animals in the vicinity of the EPL. The presence of the rocks which are found within the EPL is habitant to reptiles and the presence of tree is habitant to different types of birds species. Fauna includes specially adapted animals like the Namib Desert beetle, oryx, and desert-adapted elephants. During the site visit bsome animals droppings and spoos or foot prints, were spotted in as shown in **Figure 11**.



**Figure 11: Evidence of faunal presence on EPL 9101**

## Heritage and Archaeology

### 5.2.1 Local Level and Archaeological Findings

Archaeological sites in Namibia are protected under the National Heritage Act of 2004 (No. 27 of 2004). Evidence shows that the emergence of modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Kinahan, 2017). Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and Namib Desert.

According to past studies and during the site visit, some archaeological artifacts such as rock shelters, graves, stone circles/cains, and old buildings were observed. There may be other archaeologically significant resources may be discovered during exploration activities. Therefore, the recommendation stipulated in the EMP should be strongly be adhered to. **Figure 12** below shows ruins which were observed on site.





**Figure 12: Graves observed within the project area**

## Surrounding Land Uses

The EPL falls within Commercial land. The Proponent is required to secure a signed agreement from the affected landowners/farmers, and managements to gain access to the areas of interest for prospecting and exploration investigations as per Section 52 of the Minerals (Prospecting and Mining) Act No. 33 of 1992 and Section 2.2.3 of the Minerals Policy of Namibia.

1. *Section 52 (1) The holder of a mineral licence shall not exercise any rights conferred upon such holder by this Act or under any terms and conditions of such mineral license –*
  - (a) *In, on, or under any and until such time as such holder has entered into an agreement in writing with the owner of such land containing terms and conditions relating to the payment of compensation, or the owner of such land has in writing waved any right to such compensation and has submitted a copy of such agreement or waiver to the Commissioner.*

Section 2.2.3 of the Draft Minerals Policy of Namibia states that the License Holder and/or mineral explorers currently have to negotiate a contract with landowners to gain access for exploration purposes.

## 6 PUBLIC CONSULTATION PROCESS

Public consultation is an important component of an Environmental Assessment (EA) process. It provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process, thus assisting the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures. Public consultation for this scoping study has been done in accordance with the EMA and its EIA Regulations.

### 6.1 Pre-identified and Registered Interested and Affected Parties (I&APs)

Relevant and applicable national, regional, and local authorities, local leaders, and other interested members of the public were identified. Pre-identified I&APs were contacted directly, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request. The summary of pre-identified and registered I&APs is listed in **Table 5** below and the complete list of I&APs is provided in **Appendix D**.

**Table 4: Summary of Interested and Affected Parties**

<b>National (Ministries and State-Owned Enterprises)</b>
Ministry of Environment, Forestry and Tourism
Ministry of Mines and Energy
<b>Regional, Local and Traditional Authorities</b>
Erongo Regional Council
Arandis Constituency
Dorob National Park
<b>General Public</b>
Landowners /Interested members of the public

## Communication with I&APs

Regulation 21 of the EIA Regulations details the steps to be taken during a public consultation process and these have been used in guiding this process. Communication with I&APs with regard to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed exploration works was compiled and emailed to pre-identified I&APs, and upon request to all new registered I&APs;
- Project Environmental Assessment notices were published in The Namibian and New Era Newspaper (09<sup>th</sup> April 2024 and 16<sup>th</sup> April 2024), briefly explaining the activity and its locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- Site notices with information about the project and the meeting were placed at the Pick n Pay Swakopmung Erongo Region.
- Consultation meeting was scheduled and held at Ministry of Environment, Forestry, and Tourism office, 09h00, with the I&APs.

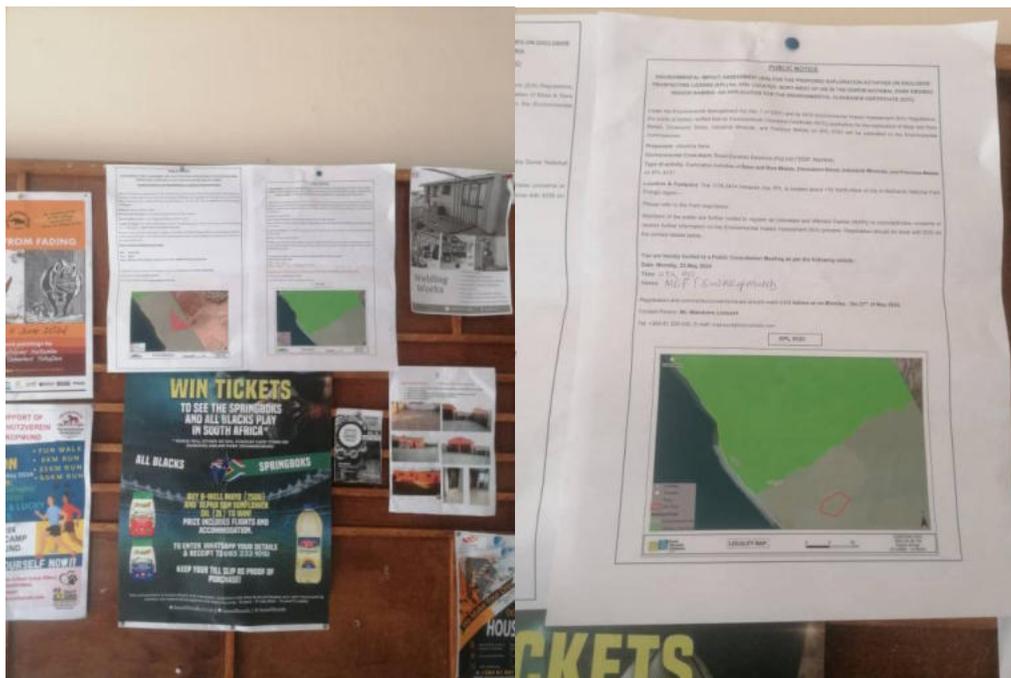


Figure 13: Public notices placed at Pick n Pay Swakopmund, Erongo region Namibia

Issues raised by I&APs have been recorded and incorporated in the environmental report and EMP. The summarized issues raised during the public meeting are presented in **Table 6**. The issues raised and responses by EDS are attached under **Appendix D**.

**Table 5: Summary of main issues raised in public meeting**

Issue	Concern

## 7 IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION MEASURES

### Impact Identification

Proposed developments/activities are usually associated with different potential positive and/or negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts. This is done to ensure that these impacts are addressed by providing adequate mitigation measures such that an impact's significance is brought under control, while maximizing the positive impacts of the development. The potential positive and negative impacts that have been identified from the prospecting activities are listed as follow:

#### Positive impacts:

- Creation of jobs
- Production of a trained workforce
- Boosting of the local and regional economic development.
- Opens up other investment opportunities and infrastructure-related development benefits

#### Negative impacts:

- Disturbance to grazing land
- Land degradation and Biodiversity Loss
- Generation of dust
- Impact on water resources
- Pollution of soil & water resources
- Waste Generation
- Occupational health & safety risks
- Vehicular Traffic Use & Safety
- Noise & Vibrations
- Disturbance to archaeological & heritage resources
- Impacts on local roads
- Social Nuisance: local property intrusion & disturbance
- Impacts associated with closure and decommissioning of exploration works

## 7.1 Impact Assessment Methodology

The Environmental Assessment process primarily ensures that potential impacts that may occur from project activity are identified and addressed with environmentally cautious approaches and legal compliance. The impact assessment method used for this project is in accordance with Namibia's Environmental Management Act (No. 7 of 2007) and its Regulations of 2012, as well as the International Finance Corporation (IFC) Performance Standards.

The identified impacts were assessed in terms of scale/extent (spatial scale), duration (temporal scale), magnitude (severity) and probability (likelihood of occurring), as presented in **Table 7**, **Table 8**, **Table 9** and **Table 10**, respectively.

In order to enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable. It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

- Provision of a brief explanation of the impact.
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment. The following criteria were applied in this impact assessment:

### 7.1.1 Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. **Table 7** shows rating of impact in terms of extent of spatial scale.

**Table 6: Extent / Spatial Impact rating**

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Impact is localized within the site boundary: Site only	Impact is beyond the site boundary: Local	Impacts felt within adjacent biophysical and social environments: Regional	Impact widespread far beyond site boundary: Regional	Impact extend National or over international boundaries

### 7.1.2 Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 8** shows the rating of impact in terms of duration.

**Table 7: Duration Impact rating**

Low (1)	Low/Medium (2)	Medium (3)	Medium/High (4)	High (5)
Immediate mitigating measures, immediate progress	Impact is quickly reversible, short term impacts (0-5 years)	Reversible over time; medium term (5-15 years)	Impact is long-term	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

### 7.1.3 Intensity, Magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These ratings were also taken into consideration during the assessment of severity. **Table 9** shows the rating of impact in terms of intensity, magnitude or severity.



**Table 8: Intensity, magnitude or severity impact rating**

Type of criteria	Negative				
	H- (10)	M/H- (8)	M- (6)	M/L- (4)	L- (2)
<b>Qualitative</b>	Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

**7.1.4 Probability of occurrence**

Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. **Table 10** shows impact rating in terms of probability of occurrence.

**Table 9: Probability of occurrence rating**

Low (1)	Medium/Low (2)	Medium (3)	Medium/High (4)	High (5)
Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.	Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards	Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.	Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.	Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.

### 7.1.5 Significance

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact “without mitigation” is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this section, for this assessment, the significance of the impact without prescribed mitigation actions is measured.

Once the above factors (**Table 7**, **Table 8**, **Table 9** and **Table 10**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$\text{SIGNIFICANCE POINTS (SP)} = (\text{MAGNITUDE} + \text{DURATION} + \text{SCALE}) \times \text{PROBABILITY}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (**Table 11**).

**Table 10: Significance rating scale**

<b>Significance</b>	<b>Environmental Significance Points</b>	<b>Colour Code</b>
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	1 to 30	L
Neutral	0	N
Low (negative)	-1 to -30	L
Medium (negative)	-30 to -60	M
High (negative)	-60<	H

**Positive (+)** – Beneficial impact

**Negative (-)** – Deleterious/ adverse+ Impact

**Neutral** – Impacts are neither beneficial nor adverse

For an impact with a significance rating of high (-ve), mitigation measures are recommended to reduce the impact to a medium (-/-ve) or low (-ve) significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the exploration phases is done for pre-mitigation and post-mitigation.

The risk/impact assessment is driven by three factors:

**Source:** The cause or source of the contamination.

**Pathway:** The route taken by the source to reach a given receptor

**Receptor:** A person, animal, plant, eco-system, property or a controlled water source. If contamination is to cause harm or impact, it must reach a receptor.

A pollutant linkage occurs when a source, pathway and receptor exist together. Mitigation measures aim firstly, avoid risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once mitigation measures have been applied, the identified risk would reduce to lower significance (Booth, 2011).

This assessment focuses on the three project phases namely, the prospecting, exploration (and possible analysis) and decommissioning. The potential negative impacts stemming from the proposed activities of the EPL are described, assessed and mitigation measures provided thereof. Further mitigation measures in a form of management action plans are provided in the Draft Environmental Management Plan.

## Assessment of Potential Negative Impacts

The main potential negative impacts associated with the operation and maintenance phase are identified and assessed below:

### 7.1.6 Disturbance to the grazing land

The EPL is overlying commercial farms with livestock, and wildlife occurring in the area . Exploration activities such as site clearing, trenching, and drilling can lead to the disturbance of grazing land. This will potentially affect the grazing land available to wildlife and livestock, and since the wildlife and livestock greatly depend on the little available flora, their livelihood will be impacted.

The effect of exploration work on the land (when done over a wider spatial extent), if not mitigated, may hinder grazing areas. Under the status quo, the impact can consider to be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a lower significance. The impact is assessed in **Table 12** below.

**Table 11: Assessment of impacts of exploration on grazing land**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
<b>Pre mitigation</b>	M: -3	M: -3	M: -3	M/H: 4	M: -36
<b>Post mitigation</b>	L/M: -2	L/M: -2	L/M: -2	L/M: 3	L: -18

### 7.1.7 Land Degradation and Loss of Biodiversity

**Fauna:** The trenching, pitting and drilling activities carried out during exploration would result in land degradation, leading to habitat loss for a diversity of flora and fauna ranging from microorganisms to large animals and trees. Endemic species are most at risk, since even the slightest disruption in their habitat can result in extinction.

The presence and movement of the exploration workforce and operation of project equipment and heavy vehicles would disturb livestock and wildlife present on farms. The proposed activities may also carry the risk of potential illegal hunting of local wildlife and livestock. This could lead to reduction of specific faunal species, which may limit tourism (sightseeing and safari) activity in the area.

Additionally, if the exploration sites are not rehabilitated, they could pose a high risk of injuries to animals by falling into holes and pits.

**Flora:** Direct impact of exploration works on flora will mainly occur through clearing for exploration access routes and associated infrastructure. The dust emissions from drilling may also affect surrounding vegetation through the fall of dust, if excessive. Some loss of vegetation is an inevitable consequence of the development. However, given the abundance of the shrubs and site-specific areas of exploration on the EPL, the impact will be localized, therefore manageable.

Under the status, the impact can be of a medium significance rating. With the implementation of appropriate mitigation measures, the rating will be reduced to a low significance rating. The impact is assessed in **Table 13** below.

**Table 12: Assessment of impacts of exploration on biodiversity**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
<b>Pre mitigation</b>	M: -4	M: -4	M: -4	M/H: 4	M: -48
<b>Post mitigation</b>	L/M: -2	L/M: -2	L/M: -2	L/M: 3	L: -30

### 7.1.8 Generation of Dust (Air Quality)

Dust emanating from site access routes when transporting exploration equipment and supplies to and from site may compromise the air quality in the area. Vehicular movements from heavy vehicles would potentially create dust, even it is not anticipated to be high. Additionally, activities

carried out as part of the exploration works such as drilling would contribute to the dust levels in the air. The medium significance of this impact can be reduced to a low significance rating by properly implementing mitigation measures. The impact is assessed in **Table 14** below.

**Table 13: Assessment of Impacts of exploration on air quality**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M: -3	M: -3	M/L: -4	M/H: 4	M: -40
Post mitigation	L - 2	L - 2	L - 2	L - 1	L - 6

### 7.1.9 Water Resources Use

Water resources can be impacted by project developments/activities in two ways - through pollution (water quality) or over-abstraction (water quantity), or at times, both.

The abstraction of more water than can be replenished from low groundwater potential areas would negatively affect the local communities (farmers and livestock) that depend on the same low potential groundwater resources.

The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Exploration activities use a lot of water, mainly for drilling. However, this depends on the type of drilling methods employed and the type of mineral being explored for.

The exact amounts of water required for proposed operations would be dependent on the duration of the exploration works and number of exploration boreholes required to make reliable interpretation on the commodities explored for. The exploration period is temporally limited, therefore, the impact will only last for the duration of the exploration activities and ceases upon completion.

Without the implementation of any mitigation measures, the impact can be rated as medium, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in **Table 15** below.

**Table 14: Assessment of impacts of exploration on water resources**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 3	L/M - 4	M/H - 4	M - 40
Post mitigation	L/M - 1	L/M - 1	L - 2	L/M - 3	L - 12

### 7.1.10 Soil and Water Resources Pollution

The proposed exploration activities are associated with a variety of potential pollution sources (i.e., lubricants, fuel, and wastewater) that may contaminate/pollute soils, and eventually, surface and groundwater. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, and equipment as well as potential wastewater/effluent from exploration related activities.

The spills (depending on volumes spilled on the soils) from machinery, vehicles and equipment could infiltrate into the ground and pollute the fractured or faulted aquifers on site, and with time reach further groundwater systems in the area. However, it should be noted that the scale and extent/footprint of the activities where potential sources of pollution will be handled is relatively small. Therefore, the impact will be moderately low.

Pre-implementation of any mitigation measures, the impact significance is medium to high and upon implementation, the significance will be reduced to moderate. The impact is assessed in **Table 16** below.

**Table 15: Assessment of impacts of exploration on soils and water (pollution)**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 5	M/L - 3	M/L - 3	M - 4	M - 44
Post mitigation	L - 3	M - 3	L - 3	L/M - 3	L - 27

### 7.1.11 Waste Generation

During the prospecting and exploration program, domestic and general waste is produced on site. If the generated waste is not disposed of in a responsible way, land pollution may occur on the EPL or around the sites. The EPL are in an area of moderate sensitivity to pollution. Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil and groundwater contamination, in case of spills and leakages. Therefore, the exploration programme needs to have appropriate waste management for the site. To prevent these issues, any hazardous waste that may have an impact on the animals, vegetation, water resources and the general environment should be handled cautiously. Without any mitigation measures, the general impact of waste generation has a medium significance. The impact will reduce to low significance, upon implementing the mitigation measures. The assessment of this impact is given in **Table 17**.

**Table 16: Assessment of impacts of exploration on waste generation**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 2	L/M - 2	M - 6	M - 5	M - 50
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8

### 7.1.12 Occupational Health and Safety Risks

Project personnel (workers) involved in the exploration activities may be exposed to health and safety risks. These may result from accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving heavy machinery or vehicles) accidents. The site safety of all personnel is the Proponent's responsibility and should be adhered to as per the requirements of the Labour Act (No. 11 of 2007) and the Public Health Act (No. 36 of 1919). The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the project workers or to animals.

The use of heavy equipment, especially during drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks, which could pose a safety risk to the project workers,

equipment and vehicles. It may also lead to widespread veld fires if an outbreak is not contained and if machinery and equipment are not properly stored, the safety risk may be a concern for project workers and residents.

The impact is probable and has a medium significance rating. However, with adequate mitigation measures, the impact rating will be reduced to low. This impact is assessed in **Table 18** below.

**Table 17: Assessment of impacts of exploration on health & safety**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M – 3	M/L - 2	M - 6	M/H - 4	M – 44
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

### 7.1.13 Noise and vibrations

Prospecting and exploration work may be a nuisance to surrounding communities due to the noise produced by the activity (especially drilling). Excess noise and vibrations can be a health risk to workers on site. The exploration equipment used for drilling on site is of medium size and the noise level is bound to be limited to the site only, therefore, the impact likelihood is minimal. Without any mitigation, the impact is rated as of medium significance. To change the impact significance from the pre-mitigation significance to low rating, the mitigation measures should be implemented. This impact is assessed in **Table 19** below.

**Table 18: Assessment of the impacts of noise and vibrations**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	L/M - 3	L/M - 2	M - 6	M/H - 3	M – 33
Post mitigation	L - 1	L/M - 2	L - 2	L/M -2	L - 10

### 7.1.14 Disturbance to Archaeological and Heritage resources

There is a possibility of unveiling/discovering new archeological and/or cultural materials in the proposed project area. If such materials are found, the areas must be mapped, and coordinates

taken to establish “No-Go-Areas”, due to their sensitivity; and must be documented. They may be protected either by fencing them off or demarcation for preservation purposes, or excluding them from any development, no exploration activities should be conducted near these recorded areas through establishment of buffer zones.

This impact can be rated as medium significance if there are no mitigation measures in place. Upon implementation of the necessary measures, the impact significance will be reduced to a lower rating. The impact is assessed in **Table 20**.

**Table 19: Assessment of impacts of exploration on archaeology & heritage resources**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
<b>Pre mitigation</b>	M - 4	M/H - 4	M - 4	M/H - 4	M – 48
<b>Post mitigation</b>	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12

#### 7.1.15 Impact on Local Roads/Routes

Exploration projects are usually associated with movements of heavy trucks and equipment or machinery that use local roads. Heavy vehicles travelling on local roads exert pressure on the roads and may make the roads difficult to use. This will be a concern if maintenance and care is not taken during the exploration phase. The impact would be short-term (during exploration only) and therefore, manageable.

Without any management and or mitigation measures, the impact can be rated as medium and to reduce this rating to low, mitigation measures will need to be effectively implemented. The assessment of this impact is presented in **Table 21**.

**Table 20: Assessment of impacts of exploration on local roads**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
<b>Pre mitigation</b>	M/H - 4	M - 3	M - 6	M – 3	M – 39
<b>Post mitigation</b>	L - 1	L - 1	M/L - 4	M/L -2	L - 12

### 7.1.16 Social Nuisance: Local Property intrusion and Disturbance/Damage

The presence of some non-resident workers may lead to social annoyance to the local community. This could particularly be a concern if they enter or damage private property. The private properties of the locals may include houses, fences, vegetation, livestock and wildlife, or any properties of economic or cultural value to the farm/land owners or land users. Unpermitted and unauthorized entry to private property may cause clashes between the affected property (land) owners and the Proponent.

The impact is rated as of medium significance. However, upon mitigation (post-mitigation), the significance changes to low rating. The impact is assessed and presented in the **Table 22**.

**Table 21: Assessment of social impacts of exploration**

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 2	M - 3	M - 4	M/H – 3	L – 27
Post mitigation	L - 1	L - 1	M/L - 4	M/L -2	L - 12

## 8 RECOMMENDATIONS AND CONCLUSION

### 8.1 Recommendations

The potential positive and negative impacts of the proposed exploration activities on EPL 9101 were identified, assessed and appropriate management and mitigation measures provided for implementation by the Proponent, their contractors and project related employees.

Mitigation measures to the identified impacts have been provided in the Environmental Management Plan, in order for the Proponent to avoid and/or minimize their significance of impacts on the environmental and social components. Most of the potential impacts were found to be of medium rating significance. With effective implementation of the recommended management and mitigation measures, the rating in the general significance of negative impacts is expected to change from Medium to Low. To maintain the desirable rating, the implementation of management and mitigation measures should be monitored by the Proponent directly, or their Environmental Control Officer. The monitoring of implementation will not only be done to maintain

low rating, but also to ensure that all potential impacts identified in this study, and other impacts that might arise during implementation are properly identified in time and addressed right away.

The Environmental Consultant is confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by effective implementation of the recommended management and mitigation measures, and with more effort and commitment put towards monitoring the implementation of these measures.

It is, therefore, recommended that in the case of ECC issuance for this project, the proposed prospecting and exploration activities may be granted an ECC, provided that:

- All the management and mitigation measures provided in the EMP are effectively and progressively implemented.
- All required permits, licenses and approvals for the proposed activities should be obtained as required.
- The Proponent and all project workers and contractors must comply with the legal requirements governing the project and ensure that all required permits and or approvals are obtained and renewed as stipulated by the issuing authorities.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable, to their pre-exploration state.

### **Conclusion**

It is crucial for the Proponent and their contractors to effectively implement the recommended management and mitigation measures, in order to protect the biophysical and social environment throughout the project duration. This would be done with the aim of promoting environmental sustainability, while ensuring a smooth and harmonious existence and purpose of the project activities in the community and environment at large. It is also to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed accordingly. Lastly, should the ECC be issued, the Proponent will be expected to be compliant with the ECC conditions as well as legal requirements governing mineral exploration and related activities.

## 9 REFERENCES

- Booth, P. (2011). Environmental Conceptual Site Model Exercise: Source – pathway – receptor. WSP Global: Semantic Scholar.
- FAO. (2006). *World Reference Base for Soil Resources*. Food and Agriculture Organization of the United Nations.
- Freeze, R. A., & Cherry, J. A. (1979). *Groundwater*. Prentice-Hall.
- Goscombe, B., Gray, D., & Armstrong, R. (2003). Geology of the Kaoko Belt, Namibia: Outcrop-scale mapping and structural analysis. *South African Journal of Geology*, 106(2), 75-105.
- IUSS Working Group WRB. (2015). *World Reference Base for Soil Resources 2014, update 2015 International soil classification system for naming soils and creating legends for soil maps*. World Soil Resources Reports No. 106. FAO, Rome.
- Mendelsohn. (2002). *The Atlas of Namibia: A Portrait of the land and its people*. pg 14 -18
- Mendelsohn, J. (2003). *Atlas of Namibia: A Portrait of the Land and its People*. Windhoek: The Ministry of Environment and Tourism of Namibia.
- Miller, R. McG. 1983a. The Pan-African Damara Orogen of South West Africa/Namibia, 431-515. In: Miller, R.McG. (Ed.) *Evolution of the Damara Orogen of South West Africa/Namibia*. Spec. Publ. geol. Soc. S. Afr., 11, 515 pp.
- Moll, Eugene (2013). *Watter Boom is dit?*. ISBN 978-1-77007-832-1.
- Meteoblue (2023). *Meteoblue Weather: Simulated historical climate & weather data for Khorixas Area*. Available from [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/epukiro\\_namibia\\_3357647](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/epukiro_namibia_3357647) . Accessed 10 July 2023
- UNESCO. (n.d.). *Namib Sand Sea*. Retrieved from <https://whc.unesco.org/en/list/1430/>



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Vigne. P (2000). Options for Livelihoods Diversification in Omaheke Region. A Report on a semi-structured interview Survey conducted by Oxfam Canada in Collaboration with the Ministry of Agriculture, Water and Rural Development. Windhoek: Oxfam Canada