SERJAHGE CONSULTANTS
Sustainability is Tomorrow's Usage Assurance
CC/2020/0010007

+264 81 407 5536
info@serjaconsultants.com
P.O. Box 27318, Windhoek
Namibia

Environmental Scoping Assessment (ESA) Study Report:

The Proposed Prospecting and Exploration Activities on Exclusive Prospecting License (EPL) No. 8125 Near Ai-Ais in the //Karas Region, Namibia - An Application for Environmental Clearance Certificate (ECC)

MEFT Application No.: **APP-001422**

Document Version: **Final for Submission**

Proponent: **Ndiili Benson Malima**
P. O. Box 3860 Oshakati, Namibia

November 2023

DOCUMENT INFORMATION

Title: Environmental Scoping Assessment (ESA) Study Report for the Proposed Prospecting and Exploration Activities on Exclusive Prospecting License (EPL) No. 8125 Near Ai-Ais in the //Karas Region, Namibia - An Application for Environmental Clearance Certificate (ECC)

Prepared by:

Author:	**Fredrika N. Shagama (Hydrogeologist & Environmental Consultant / EAP*)**
Qualifications:	**PhD. Student: Civil Engineering (Geotechnics & Hydrogeology)**, VSB - Technical University of Ostrava, Czech Republic **MSc. Geological Engineering** (*cum laude*) with primary focus in Hydrogeology, VSB - Technical University of Ostrava, Czech Republic **BSc. Geological Engineering**, VSB - Technical University of Ostrava, Czech Republic
Professional Affiliations:	International Association of Hydrogeologists (IAH) - Full Member, Membership No.139790 Namibian Hydrogeological Association (NHA) – Member Environmental Assessment Professionals of Namibia (EAPAN) - Ordinary Member Practitioner (Membership No. 183)
Contact Details:	Mobile: +264 81 749 9223 Email: eias.public@serjaconsultants.com Postal Address: P. O. Box 27318 Windhoek, Namibia
Signature:	
Date:	November 2023

EAP* - *Environmental Assessment Practitioner*

SERJA' STATEMENT OF INDEPENDENCE

As the Appointed Environmental Consultant to undertake the Environmental Scoping Assessment (ESA) Study for the proposed prospecting and exploration activities on EPL-8125 near Ai-Ais in the //Karas Region, Serja Hydrogeo-Environmental Consultants cc declare that we:

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

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

……..

Signature:

Fredrika N. Shagama: Principal Environmental Assessment Practitioner & Hydrogeologist

Date: November 2023

EXECUTIVE SUMMARY

Ndiili Benson Malima (hereinafter referred to as the Proponent) has been granted the rights to explore on Exclusive Prospecting Licence (EPL) No. 8125 by the Ministry of Mines and Energy (MME) on the 15th of February 2021, and is due to expire on the 14th of February 2024.

The EPL is located about 5km west - 3km north of Ai-Ais in the //Karas Region and covers an area of 69,586.238 hectares (Ha).

The EPL-8125 covers Farm Soutkuil No. 181, Farm Bobbejaankrans No. 180, Farm Wegdraai No. 174, Farm Kochas No. 113 and the upper eastern part of Farm Mara No. 114.

The Proponent intends to prospect and explore for mineral commodities within EPL-8125 (Base & Rare Metals, Dimension Stone, Industrial Minerals, Precious Metals, and Precious Stones). However, before commencing with these activities, the Proponent is required to obtain an Environmental Clearance Certificate (ECC) from the Environmental Commissioner.

Proposed Project Activities

The project will be carried out using two groups of techniques:

- Non-invasive technique (Desktop Study). During the prospecting and exploration phase, the vital components include reviewing existing reports and composite stratigraphic, lithological-geochemical maps of the targeted areas to identify prospective lithostratigraphic packages. In addition to the literature review, fieldwork (lithological (soil/rock) mapping and sampling) will be conducted to verify desktop work. These works do not require physical disturbance.
- Invasive techniques (Detailed exploration): This will entail the verification of information collected during the desktop study and survey and obtain more/detailed information about the EPL. The invasive techniques include soil sampling, trenching, and drilling.

Communication with I&APs, and Means of Consultation Employed

The ESA Study was undertaken in accordance with the EMA and its 2012 EIA Regulations. 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 regards to the proposed exploration was facilitated through the following means:

- A Background Information Document (BID) containing brief information about the proposed project was compiled and uploaded on the MEFT (ECC) Portal for project registration and shared with registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in The Namibia Media Holdings' *Market Watch newspapers* (*Allgemeine Zeitung*, *Die Republikein, and Namibian Sun*) dated 30 March

2023 and 05 April 2023. The adverts provided a brief of the activity, locality, inviting members of the public to register as I&APs and submit their comments/concerns.

- After the newspaper adverts, attempts (telephone and email communication) were made with regional and local stakeholders (constituency), famers union as well as MAWLR's Land Reform Department in May 2023 to assist in obtaining the contact details for the farmers/landowners affected by the EPL, but to no avail. Proofs of these attempts/efforts are attached hereto.

Impact Assessment

Some key potential positive and negative impacts were identified. The key negative impacts were described, assessed and appropriate management and mitigation measures made for implementation (as provided in the Draft EMP). The potential negative impacts assessed have a medium and some with a slightly high rating significance. The significance of the adverse (negative) impacts cannot be avoided can be reduced to acceptable levels by the effective implementation of the recommended management and mitigation measures accompanied by implementation monitoring.

The summary of the assessed potential adverse impacts (based on impact significance rating) is provided below:

- Physical land / soil disturbance and impact on grazing areas: *pre-mitigation – medium, post-mitigation – low.*
- Biodiversity (fauna and flora); potential illegal harvesting of protected vegetation and wildlife hunting (poaching) and habitat disturbance in the area, impacting tourism: *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Impact on groundwater resources (over-abstraction/use): *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Water and soil pollution: *pre-mitigation - medium, post-mitigation – low*.
- Air quality (compromising surrounding air quality) - *pre-mitigation – medium, post-mitigation – low.*
- Visual impacts due to land scars owing to Dimension Stone exploration activities, resulting in the impact on tourism: *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Occupational and community health, safety and security risks: *pre-mitigation – medium, post-mitigation – low.*
- Vibrations and noise associated with exploration trenching and drilling: *pre-mitigation – medium, post-mitigation – low.*
- Vehicular traffic safety & impact on services infrastructure (e.g., local roads): *pre-mitigation – medium, post-mitigation – low.*
- Environmental pollution (poor waste management): *pre-mitigation – medium, post-mitigation – low.*
- Archaeological and cultural heritage impact: *pre-mitigation – medium, post-mitigation – low.*

- Social nuisance and conflicts due to land use (theft, property damage, etc.) - *pre-mitigation – slightly high to medium, post-mitigation – low.*

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

- All the management and mitigation measures provided herein are effectively and progressively implemented, with commitment on Environmental monitoring through Bi-Annual EMP Compliance reporting by an Environmental Control Officer (ECO) and audited by an Independent Environmental Consultant. The monitoring of this implementation will not only be done to maintain the reduce impacts' rating or maintain low rating but to also ensure that all potential impacts that might arise during implementation are properly identified in time and addressed immediately.
- **The landowners should be consulted before commencing with the exploration activities in the area.**
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land access agreements, services provision agreements (water supply and waste disposal) to explore and ensuring compliance with these specific legal requirements.
- The Proponent, and their workers/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.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable. This includes the levelling of stockpiled topsoil, backfilling of exploration trenches and closing/capping of exploration holes.

To maintain the desirable rating and that the potential impacts are under control, the implementation of management and mitigation measures should be monitored by their Environmental Control Officer (ECO) and audited by an Independent Environmental Consultant on a bi-annual basis. The monitoring of this implementation will not only be done to maintain the reduce impacts' rating or maintain low rating but to also ensure that all potential impacts that might arise during implementation are properly identified in time and addressed immediately.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

Appendix A: The Draft Environmental Management Plan (EMP) - *uploaded separately on the Portal as required (under ''Proof of Public Consultation'' file)*

Appendix B: Curriculum Vitae (CV) of the responsible Environmental Assessment Practitioner (EAP) - *uploaded separately on the Portal as required (under ''Proof of Public Consultation'' file)*

Appendix C: EIA Notification in the newspapers: *Allgemeine Zeitung, Die Republikein* & *Namibian Sun* - *uploaded separately on the Portal as required (under ''Proof of Public Consultation'' file)*

Appendix D: Proof of Email Communication (follow-up on telephone calls) sent to the regional and local stakeholders (constituency), famers union as well as MAWLR's Land Reform Department in May 2023 to assist in obtaining the contact details for the farmers/landowners affected by the EPL

LIST OF ABBREVIATIONS

Abbreviation	Meaning
BID	Background Information Document
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
ESA	Environmental Scoping Assessment
GG	Government Gazette
GN	Government Notice
I&APs	Interested and Affected Parties
IFC	International Finance Corporation
MAWLR	Ministry of Agriculture, Water and Land Reform
MEFT	Ministry of Environment, Forestry and Tourism
MME	Ministry of Mines and Energy
NHC	National Heritage Council (NHC) of Namibia
PPE	Personal Protective Equipment
Reg	Regulation
S	Section

GLOSSARY (KEY TERMS)

Term	Definition
Alternative	A possible course of action, in place of another that would meet the same purpose and need of the proposal.
Baseline	Work done to collect and interpret information on the condition/trends of the existing environment.
Biophysical	The part of the environment that does not originate with human activities (e.g., biological, physical and chemical processes).
Cumulative Impacts / Effects Assessment	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.
Decision-maker	The person(s) entrusted with the responsibility for allocating resources or granting approval to a proposal
Ecological Processes	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).
Environment	As defined in 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.
Environmental Management Plan (Draft EMP)	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.
Exclusive Prospecting Licence	A license that confers exclusive mineral prospecting rights over land of up to 1000km^2 in size for an initial period of 3 years, renewable twice for a maximum of 2 years at a time.
Interested and Affected Party (I&AP)	In relation to the assessment of a listed activity includes - (a) any person, group of persons or organization interested in or affected by an activity; and (b) any organ of state that may have jurisdiction over any aspect of the activity. Mitigate - practical measures to reduce adverse impacts. Proponent – as defined in the Environmental Management Act, a person who proposes to undertake a listed activity. Significant impact - 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
Fauna and Flora	The animals and plants found in an area.
Mitigation	The purposeful implementation of decisions or activities that are designed to reduce the undesirable impacts of a proposed action on the affected environment

Term	Definition
Monitoring	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).
Proponent	Organization (private or public sector) or individual intending to implement a development proposal.
Public Consultation/Involvement	A range of techniques that can be used to inform, consult or interact with stakeholders affected by the proposed activities.
Protected Area	Refers to a protected area that is proclaimed in the Government Gazette according to the Nature Conservation Ordinance number 4 of 1975, as amended.
Scoping	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.

1 INTRODUCTION

1.1 Project Background and Location

Ndiili Benson Malima (hereinafter referred to as the Proponent) has been granted the rights to explore on Exclusive Prospecting Licence (EPL) No. 8125 by the Ministry of Mines and Energy (MME) on the 15th of February 2021, and is due to expire on the 14th of February 2024 as shown in Figure 1-1.

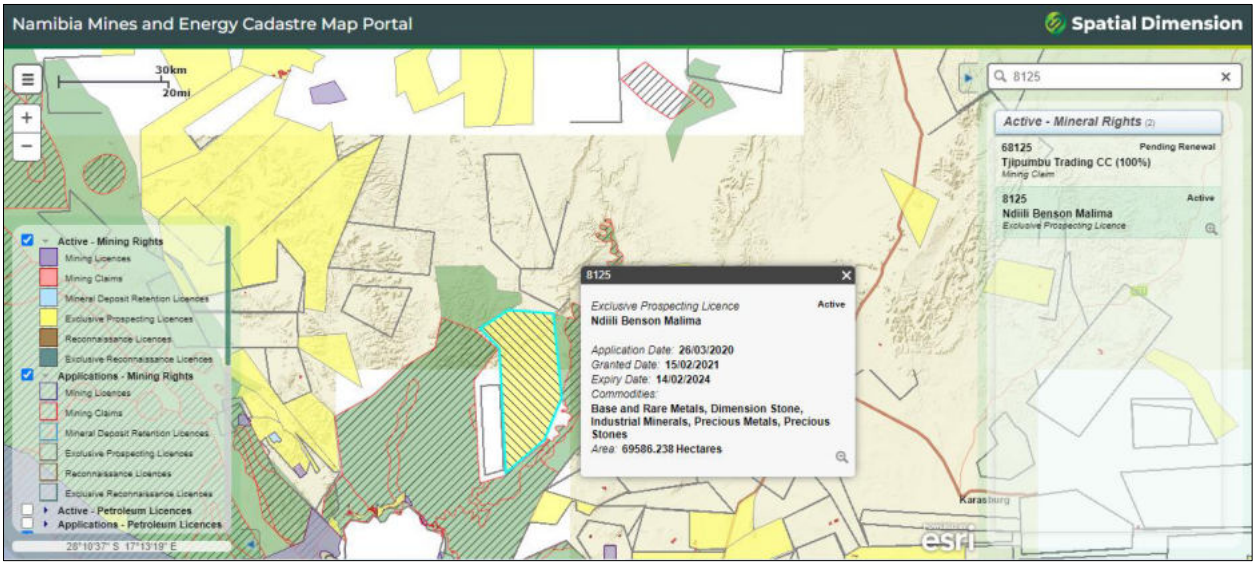

Figure 1-1: The status of EPL-8125 on the Namibia Mines and Energy Cadastre Map (https://portals.landfolio.com/namibia/)

The Proponent intends to prospect and explore for mineral commodities within EPL-8125 (Base & Rare Metals, Dimension Stone, Industrial Minerals, Precious Metals, and Precious Stones). However, before commencing with these activities, the Proponent is required to obtain an Environmental Clearance Certificate (ECC) from the Environmental Commissioner

The EPL is located about 5km west - 3km north of Ai-Ais in the //Karas Region and covers an area of 69,586.238 hectares (Ha) - Figure 1-2

As shown in Figure 1-3, EPL-8125 covers Farm Soutkuil No. 181, Farm Bobbejaankrans No. 180, Farm Wegdraai No. 174, Farm Kochas No. 113 and the upper eastern part of Farm Mara No. 114.

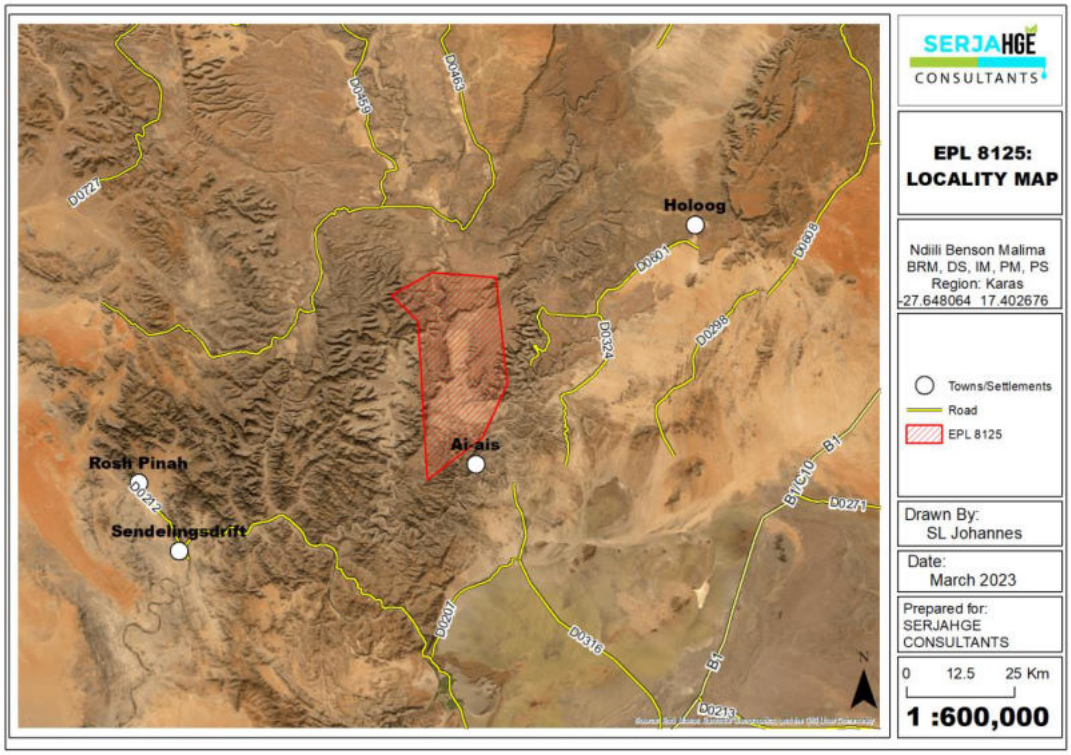

Figure 1-2: Locality Map of EPL-8125 near Ai-Ais in the //Karas Region

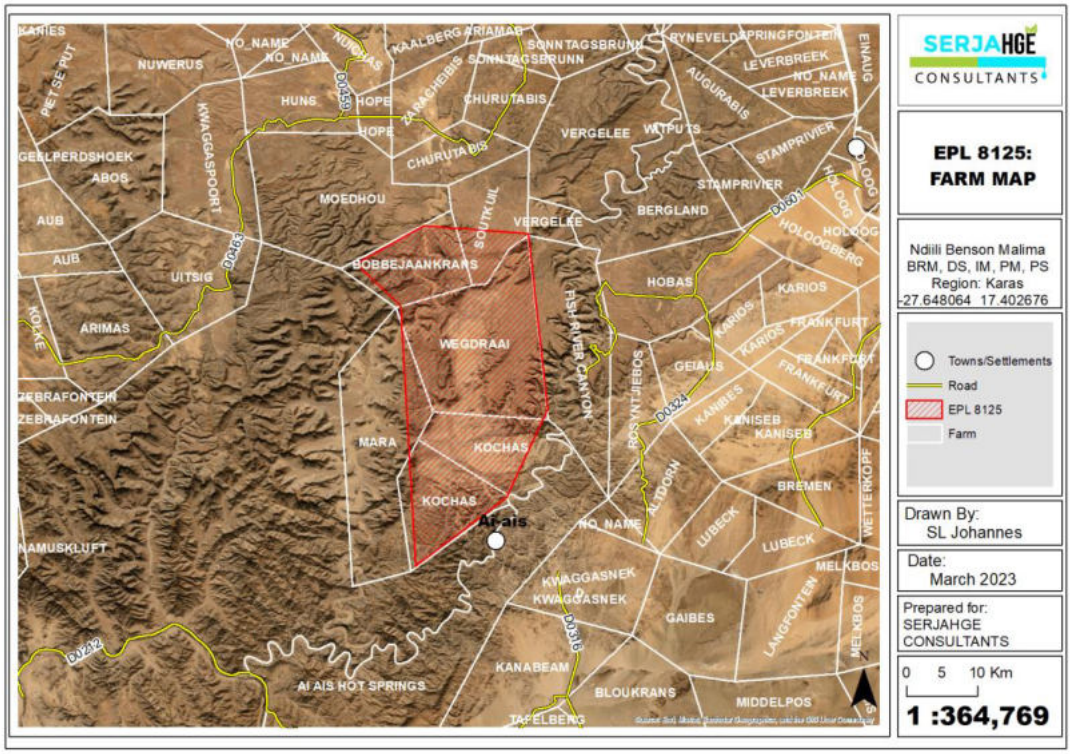

Figure 1-3: Locality Map with the farms covered by EPL-8125

1.2 The Need and Desirability of Prospecting and Exploration Activities

Mining contributes about 12.5% towards Namibia's Gross Domestic Product (GDP). The mining industry is one of the largest contributors to the Namibian economy; therefore, it contributes to the improvement of livelihoods. In Namibia, exploration for minerals is done mainly by the private sector.

Therefore, the successful exploration of mineral commodities on the EPL would contribute towards achieving the goals of the national development plans through GDP and contribute to the global industrial use.

1.3 The Need for an ESA and Environmental Clearance Certificate (ECC)

Prospecting, exploration of and mining of mineral resources is one of the listed activities in the Environmental Impact Assessment (EIA) Regulations (2012) of the Environmental Management Act (EMA) No. 7 of 2007 that may not be undertaken without an Environmental Clearance Certificate (ECC). The activities that are relevant to proposed project activities are as follows:

- *3.1 The construction of facilities for any process or activities which require a license, right of other forms of authorization, and the renewal of a license, right or other form 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 purpose of the ESA Study and subsequent issuance of the ECC is therefore to ensure that the proposed project activities are undertaken in an environmentally & socially friendly and sustainably manner, through the effective implementations of recommended environmental management measures to minimize the adverse identified impacts while maximizing the positive impacts.

1.4 Application for the Environmental Clearance Certificate

The application for the ECC process was done as follows:

- Prepare of prepared Background Information Document (BID) for the proposed project,
- Launching of the ECC application on the ECC Portal of the Ministry of Environment, Forestry and Tourism (MEFT) with the Proponent details (accompanied by the BID) for project registration purposes and obtaining a MEFT application / reference number (APP- 001422),
- Completion of the Form 1 (Section 32) of the EIA Regulations with the required project and Proponent information,

The next component of the ECC application was to undertake an Environmental Scoping Assessment (ESA) process, which entails Baseline Assessment of the Biophysical and Social environments as well as Public Consultation & Engagement. The findings of the ESA process are then incorporated into an ESA Report and a Draft EMP – Appendix A is also developed for the mitigation of potential adverse impacts anticipated from the proposed project activities. The two documents and associated documents (appendices) are then submitted to the Environmental Commissioner at MEFT's Department of Environmental Affairs and Forestry (DEAF) for evaluation and consideration of the ECC.

1.5 Appointed Independent Environmental Consultant

To comply with the EMA and its Regulations and ensure environmental management, protection, and sustainability, the Proponent appointed Serja Hydrogeo-Environmental Consultants CC, Independent Environmental Consultants to apply for the ECC and conduct the required Environmental Assessment Process, which includes Public Consultation and prepare the Environmental Assessment Report and Management Plan (EMP).

The ESA process, including public consultation and engagement as well as compilation of the associated documents were conducted and compiled by Ms. Fredrika Shagama. Ms. Shagama is a qualified and experienced Hydrogeologist and Environmental Assessment Practitioner (EAP) by training and experienced with over 8 years' experience in Groundwater and Environmental Management Consulting. Her CV is attached to this Report as Appendix B.

1.6 Scope of Work and Report Contents

This Study has been conducted according to the EMA No. 7 of 2007, and its 2012 EIA Regulations as mentioned in the preceding subsections, i.e., the proposed project may not be undertaken without an ECC. Therefore, the process has been undertaken as required and guided by the Regulations.

This Report has been compiled as a required output of an environmental assessment process after the ECC application has been submitted to the Competent Authority (MME). The ESA Report, together with the EMP and all its appendices will be submitted to the DEAF.

The document (Report) covers the following chapters or sections, in addition to the introductory chapter:

- Project description and associated activities - (Chapter 2).
- Project alternatives considered (that were found to be environmentally friendly and technically feasible) - Chapter 3).
- The Legal requirements governing the proposed project and its related activities, i.e., the legislations that the proposed project must comply with (Chapter 4).

- The Environmental and Social Baseline of the project area - Chapter 5.
- The Public Consultation & Engagement Process undertaken to inform, invite and engage the public (stakeholders and interested & affected parties) on the proposed project- Chapter 6.
- The Assessment of identified potential impacts associated with the proposed project (Chapter 7) - This chapter presents both the positive and negative (adverse) as well as cumulative impacts, assessment methodology and the assessment of the negative impacts. The mitigation measures in the form of management action plans, with timeframe and implementation responsibilities are given in Draft Environmental Management Plan (EMP).
- The recommendations and conclusions to the environmental assessment are presented under Chapter 8. The data sources (literature/references) consulted for the assessment are listed under Chapter 9.

Based on the information provided by the Proponent and the EAP's experience, description of the project activities is presented under the next chapter.

2 DESCRIPTION OF THE PROPOSED PROJECT ACTIVITIES

Prior to mobilizing to site and undertaking any groundwork for the proposed activities at the site (EPL-8125) and timely, the Proponent will be required to sign land access and use agreements with the affected landowners (farmers) according to Section 52 (1) (a) of the Minerals (Prospecting and Mining) Act No. 33 of 1992.

2.1 The Proposed Prospecting and Exploration Techniques

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

- Geological mapping (Non-invasive technique): The exploration program will commence with a review of geological maps and historical drilling and / or exploration data for the area, if any. Geophysical surveys form part of this technique, which will entail data collection of the substrata. Ground geophysical surveys are also conducted, where necessary using vehicle-mounted sensors.
- Lithological sampling programmes (invasive technique): these activities may last from between one week to a month at a time over specific areas, until the explored area is fully sampled as desired. This will entail rock and soil sampling consists of small pits/trenches. Soil sampling consists of small pits (±20cm X 20cm X 30cm) being dug where 1kg samples can be extracted and sieved to collect 50g of material. As necessary, and to ensure adequate risks mitigation, all major excavations will either be opened or closed immediately after obtaining the needed samples or the sites will be secured until the trenches or pits are closed.
- Drilling programmes (invasive technique): Should analyses of soil/rock samples by an analytical laboratory be positive, holes are drilled, and drill samples collected for further analysis. This programme may initially range from two weeks to a month at a time, depending on the planned programme or based on the results of the programme. The Proponent undertakes to work with all relevant stakeholders to keep them informed of exploration progress to facilitate site visits and access to ongoing field exploration programmes.
- The anticipated drilling method will be Reverse Circulation (RC) and diamond-core drilling RC drilling uses a pneumatic hammer, which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample, which is comprised of rock chips. It is relatively quicker and cheaper when compared to other techniques like Diamond Drilling. However, diamond drilling may also be considered for this exploration programme, for better geological control and to perform processing trials.
- A typical drilling site will consist of a drill-rig and support vehicles as well as a drill core and geological samples store. A drill equipment parking and maintenance yard may be set up (including a fuel and lubricants storage facility).

A typical example of drilling activities on active EPLs in Erongo and Omaheke Regions are shown in Figure 2-1 and Figure 2-2.

Figure 2-1: A-typical drill rig on an EPL (Resilient Environmental Solutions, 2019), B- drill rig on active EPL site visited by the Author in Erongo Region (photo by Author, 2022)

Figure 2-2: A drill rig on an EPL in the Omaheke Region (Resilient Environmental Solutions, 2022)

At all times, the landowner and other relevant stakeholder will be engaged to obtain authorisation where necessary.

2.2 Project Resources and Services Infrastructure

The following services and infrastructure as provided below will be required for the project activities.

2.2.1 Human resources

The prospecting stage will require but not limited to one or two geologists, GIS specialist, and geophysicist to collect the data.

The exploration crew will consist of a minimum of 7 people, comprising 1 skilled, 2 semi-skilled, 4 casual workers. However, this number may vary depending on the stages of the activities onsite. However, this number may vary depending on the actual workload and requirement onsite. The workforce requirement will entail the need for geologist(s), drilling personnel, sampling team, supervisor / exploration manager, casual workers to clear the sites and perform other required jobs onsite, cleaner(s), machine operator, truck & light vehicle drivers, etc.

2.2.2 Project Crew Accommodation

Exploration workers (from trenching and drilling stage) will be housed in tented camps onsite. However, a consent from the respective landowner will need to be obtained prior to setting up the temporary accommodation structures. Alternatively, the exploration personnel will be accommodated in Ai-Ais should onsite accommodation deem impossible.

2.2.3 Project Equipment, Material, Machinery and Vehicles

The following equipment and machinery will be required for the exploration stage:

- Two to three (4X4) pickup trucks (vehicles), and heavy truck,
- Air compressor,
- Drill rig, and drilling machines,
- Two-way radios (for communication),
- Water supply tanks with dispersion pipelines, and fuel bowser,
- Power generators (minimum two),
- Dozer (to clear vegetation along planned drilling site access paths), and
- Biodegradable drilling fluids stored in manufacturers approved containers.

Equipment and vehicles will be stored at a designated area near the accommodation site (campsite), or a storage site established within the EPL site area.

2.2.4 Water Supply

During exploration onsite water will be required for cooling down and washing of equipment, exploration related activities such as drilling, domestic (drinking, cooking, and ablution) and possibly dust suppression. For exploration related activities such as cooking, drinking and personal use, about 300 litres of water will be required per week (1,200 litres per month). Exploration drilling, specifically diamond requires a lot of water, and it would require approximately 10,000 to 25,000 litres (10 to 25m^3) per day, in instances where for example fractured formations are encountered) per hole during drilling.

To ensure that the already low potential local groundwater resources are not stressed or significantly impacted by the project activities such as drilling, the Proponent will be carting water from outside the area (where water supply is not an issue). The water will then be stored in relevant industry standard water storage tanks onsite that will be refilled as and when necessary.

A borehole cannot be drilled for exploration elsewhere on the EPL due to low groundwater potential/ rock bodies with little potential, which may negatively affect the local aquifers

It is anticipated that portable use for exploration crew (workers) will be supplied by local water supply, upon reaching an agreement with the respective farmer to supply wholly or part of domestic water.

2.2.5 Fuel supply (For Cooking)

The Proponent will provide a 10kg liquid gas cylinder to be used for food preparation by the site workers. No firewood will be collected on the farms or neighbouring land, without the owners' permission.

2.2.6 Fuel Supply (Machinery and Equipment)

Diesel will be used for machinery and equipment and fuel generator. A trailer mounted and bunded 10,000-litre fuel tank will be onsite to ensure an interrupted fuel supply to the project activities.

2.2.7 Accessibility (roads)

The EPL area is accessible via the D0601 (from Holoog) and access the site through either existing tracks or a new access track will be created. Where necessary, and with the consent, approval and guidance of the respective farm owner, few new access tracks will be created in some areas of the EPL to access the target sites for exploration and enable the movement of vehicles and drill rig.

2.2.8 Waste management

The onsite waste types will be managed as follows:

- Sewage: Portable ablution facilities with septic tanks will be provided on site and emptied according to manufacturers' instructions.
- General and domestic waste: Sufficient waste bins (containers) will be availed at both exploration sites and campsites for waste storage. The waste containers will be emptied into the main onsite container for disposal at the nearest approved landfill site, upon reaching a waste disposal agreement with the relevant nearest local authority.
- Hazardous waste: All vehicles, machinery and fuel consuming equipment will be provided with drip trays to capture potential fuel spills and waste oils. The waste fuel/oils will be carefully stored in a standardized container to be disposed of at the nearest approved hazardous waste management facility.

2.2.9 Health and Safety

The following measures will be implemented onsite to ensure safety and security:

- Adequate and appropriate Personal Protective Equipment (PPE) will be provided to every project personnel and visitor/inspector while on and working at site and visiting the site, respectively.

- First aid: A minimum of two first aid kits will be readily available at exploration and camp sites to attend to potential minor injuries, while major injuries will need to be attended to further by transporting the injured to the nearest health centre for treatment. At least two to three personnel will be trained on administer first aid.
- Potential Accidental Fire Outbreaks: As a control measure for accidental fire outbreaks, a basic firefighting equipment, i.e., a fire extinguisher will be readily available in vehicles, at the working sites and campsite (accommodation units). The site personnel will be trained on and provided with firefighting skills.
- Open exploration trenches and boreholes: The trenches dug for sampling will be temporary fenced off to prevent potential injuries of both people and livestock and wildlife on the farms. Once sampling is completed, the trenches will be progressively backfilled and levelled and fencing removed for storage or donation to the respective landowner(s). Similarly, for exploration holes that are no longer required after rock samples, they will be backfilled and closed off as shown on Figure 2-3. Warning signage at hazardous site areas such as open trenches will be erected.

Figure 2-3: Fenced off exploration trenches awaiting backfilling upon completion of sampling at an EPL

2.3 Decommissioning and Rehabilitation of Disturbed Sites

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. The economic situation or unconvincing exploration results might force the Proponent to cease the exploration program before predicted closure. Therefore, it is of best practice for the Proponent to ensure the project activities are ceased in an environmentally friendly manner and site is rehabilitated by carrying out the following:

- Dismantling and removal of campsites and associated infrastructures from the project site and area,
- Carrying away all exploration equipment and vehicles, and

- Clean up of site working areas and transporting the recently generated waste to the nearby approved waste management facility (as per agreement with the facility operator/owner),

Further decommissioning and rehabilitation practice onsite will include:

- Backfilling of pits and trenches used for sampling,
- Closing and capping of exploration boreholes to ensure that they do not pose a risk to both people and animals in the area, and
- Levelling of stockpiled topsoil. This will be done to ensure that the disturbed land sites are left close to their original state as much as possible.

2.4 Post-Exploration Activities

After a successful exploration activity, the EPL would be converted into a Mining License by submitting exploration results and an application to the MME to convert the EPL into a Mining License. Upon pre-approval of the application by MME, feasibility study and full EIA Study (with an approved ECC for mining activities), the approved area would be prepared for mine development and actual mining and subsequent mine closure.

The next chapter is the presentation different and relevant alternatives considered for the project activities.

3 PROJECT ALTERNATIVES

Alternatives are defined as the “different means of meeting the general purpose and requirements of the activity” (EMA, 2007). This section will highlight the different ways in which the project can be undertaken and to identify the alternative that will be the most practical, but least damaging to the environment is identified.

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?*

The alternatives considered for the proposed project are discussed below.

3.1 The "No-Go" Alternative

The “no action” alternative implies that the status quo remains, and nothing happens. 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 will remain unchanged.

This option was considered and a comparative assessment of the environmental and socio-economic impacts of the “no action” alternative was undertaken to establish what benefits might be lost if the project is not implemented.

Considering the above losses, the “no-action/go” alternative was not considered a viable option for this project.

3.2 Exploration Location

The prospecting/exploration location is dependent on the geological setting (regional and local), the economic geology, as well as preference of an EPL applicant in specific commodities. Therefore, finding an alternative location for this planned exploration activities for the specific commodities in the area is not possible. This means that the mineralization of the target commodities is area-specific, which means exploration targets are primarily determined by the geology (host rocks) and the ore-forming mechanism. The location of the EPL also depend on the availability of license areas that the different applicants and Proponents applied for and interested in.

Furthermore, the national mineral resources’ potential locations are also mapped and categorized by the Ministry of Mines and Energy in exclusive prospecting licenses, mining licenses and claims, mineral deposit retention licenses, reconnaissance licenses and exclusive reconnaissance licenses. Available information on EPL-8125 and other licenses are available on the Namibian Mines and Energy Cadastral Map.

3.3 Exploration Methods

Both invasive and non-invasive exploration activities as indicated under the project description chapter are expected to take place. These were found to be appropriate and reliable for the type of commodities explored for. 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, it can be implemented.

3.4 Services Infrastructure

Alternatives were considered for the different supporting infrastructures envisaged to ensure that the most feasible options were selected. The technological, economic, and environmental limitations were considered to select the most feasible option. The alternative considered in this regard are presented in Table 3-1 below.

Table 3-1: The presentation of service infrastructure alternatives considered for the project activities

Category of Infrastructure	Alternatives Considered	Justification for selected option
Ablution facilities	Install fixed facility with septic tank -Portable facilities with septic tank	-To minimize rehabilitation costs portable facilities were selected as the best option
Water supply	-Bring water from elsewhere -Abstract from site boreholes	-Most of the project water (on 70/30 ration) will be brought from elsewhere to minimize the impact on the local resources
Fuel storage	-Trailer mounted diesel tank -Fixed bunded fuel tank	-During exploration use trailer mounted diesel tank for fuel storage due to great mobility requirements during exploration.
Power supply	-Diesel generator set and if considered, solar power. -Powerline (grid) supply	-The diesel and or solar power are the most practical & economically viable options for exploration (in it ends with exploration only and money is used to set up a powerline).
Offices, accommodation	-Erect dis-mantable prefabricated units -Fixed structures	-Favoured due to: (a) Ease of installation, (b) Low installation costs and (c) Ease of dismantling & moving.
Accommodation site	-Setting up campsites tented campsite on farms within the EPL or temporary availed facilities by the farm owner(s) -Commuting from Ai-Ais	-It would be better to set up temporary campsites or agree on the provision of available accommodation facilities such as in Ai-Ais, or when necessary, on the farms instead of commuting that far to and from the site. However, this will need to be discussed and agreed upon with individual farm owner(s) prior to setting up facilities.

The following chapter presents the national and international legal requirements that are applicable and relevant to project.

4 APPLICABLE LEGAL FRAMEWORK

The project's activities or some of them may be regulated and governed by certain legal or policies. Therefore, it is necessary to review and consider these legislations and legal requirements. These legal requirements are either on a local (institutional), national (Namibian) and international legislation, policies, guidelines, etc. This review serves to inform the project Proponent, Interested and Affected Parties, 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 Environmental Management Act No. 7 of 2007

The Environmental Management Act No.7 of 2007 and its 2012 EIA Regulations aims to ensure that the potential impacts of the development on the environment are considered carefully and in good time; that all interested and affected parties have a chance to participate in the environmental assessments and that the findings of the environmental assessments are fully considered before any decisions are made about activities which might affect the environment.

The Act aims at promoting sustainable management of the environment and use of natural resources. The Environmental Management Act (EMA) is broad; it regulates land use development through environmental clearance certification and/or Environmental Impact Assessments. The Act provides for the clearance certification for '' ***mining and quarrying activities''.***

4.2 Minerals (Mining & Prospecting) Act No. 33 of 1992

The most applicable Sections to the project are as follows:

- Section 52 (1) (a) requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder.
- Section 54 requires written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area.
- Section 68 stipulates that an application for a mineral license 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 proposed steps to be taken to prevent or minimize any such effect.
- Section 91 requires that rehabilitation measures should be included in an application for a mineral license.

Implication for the proposed project: The Proponent should carry out an assessment of the impact on the receiving environment. 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 exploration activities.

Other applicable legal framework and policies relevant to the proposed project are presented in Table 4-1.

Table 4-1: List of applicable legislation for the proposed activities on the EPL

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Constitution of the Republic of Namibia, 1990 as amended	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: "…the duty to investigate complaints concerning the over-utilisation 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…" Article 95(l) commits the state to actively promoting and maintaining the welfare of the people by adopting policies aimed at the: "…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."	By implementing the environmental management plan, the establishment will be in conformant to the constitution in terms of environmental management and sustainability. Ecological sustainability will be main priority for the proposed development.
Nature Conservation Amendment Act, No. 3 of 2017	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 regards to the permission of entering 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.	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

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Parks and Wildlife Management Bill of 2008	Aims to provide a regulatory framework for the protection, conservation, and rehabilitation of species and ecosystems, the sustainable use and sustainable management of indigenous biological resources, and the management of protected areas, to conserve biodiversity and to contribute to national development.	
Minerals (Prospecting and Mining) Act (No. 33 of 1992)	Section 52(1) (a) requires mineral license holders to enter into a written agreement with affected landowners before exercising rights conferred upon the license holder. Section 54 requires written notice to be submitted to the Mining Commissioner if the holder of a mineral license intends to abandon the mineral license area. 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 proposed steps to be taken to prevent or minimize any such effect. Section 91 requires that rehabilitation measures should be included in an application for a mineral license.	The Proponent should enter into a written agreement with landowners before carrying out exploration on their land. The Proponent should carry out an assessment of the impact on the receiving environment. 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. The Proponent may not carry out exploration activities within the areas limited by Section 52 (1) of this Act.
Mine Health & Safety Regulations, 10th Draft	Makes provision for the health and safety of persons employed or otherwise present in mineral licenses area. 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 these regulations with respect to their employees.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Regulation 3(2)(b) states that “No person shall possess [sic] or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area”	The Proponent should obtain the necessary authorisation from the MME for the storage of fuel on-site.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The Regional Councils Act (No. 22 of 1992)	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 point of view, their duties include, as described in section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment.	The relevant Regional Councils are I&APs and must be consulted during the Environmental Assessment (EA) process. The project site falls under the //Karas Regional Council; therefore, they should be consulted prior to commencing with the exploration activities.
Water Act 54 of 1956	The Water Resources Management Act 11 of 2013 is presently without regulations; therefore, the Water Act No 54 of 1956 is still in force: Prohibits the pollution of water and implements the principle that a person disposing of effluent or waste has a duly of care to prevent pollution (S3 (k)). Provides for control and protection of groundwater (S66 (1), (d (ii)). Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	The protection (both quality and quantity/abstraction) of water resources should be a priority. Relevant permits and or agreements to abstract and use water should be applied for and obtained.
Water Resources Management Act (No 11 of 2013)	The Act provides for the management, protection, development, use and conservation of water resources; and provides for the regulation and monitoring of water services and to provide for incidental matters. The objects of this Act are to: 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 (Section 68).	
National Heritage Act No. 27 of 2004	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.	

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	The Proponent should ensure compliance with these Acts requirements. The necessary management measures and related permitting requirements must be taken. This done by the consulting with the National Heritage Council of Namibia. A Chance Finds Procedure provided to the Draft EMP should be implemented upon discovery of archaeological and heritage resources.
Soil Conservation Act (No 76 of 1969)	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	The Act provides for the management and use of forests and forest products. Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence 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 on a gully unless the cutting, destruction or removal is done for the purpose of stabilising 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)	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 charge any nuisance or other condition liable to be injurious or dangerous to health."	The Proponent and all its employees should ensure compliance with the provisions of these legal instruments.
Public and Environmental Health Act No. 1 of 2015	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.	

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	
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 Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.	The proposed project and related activities should be undertaken in such a way that they do not pollute or compromise the surrounding air quality. Mitigation measures should be put in place and implemented.
Hazardous Substance Ordinance, No. 14 of 1974	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	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.	Mitigation measures should be provided for, if the roads and traffic impact cannot be avoided, the relevant permits must be applied for.
Labour Act (No. 6 of 1992)	Ministry of Labour, Industrial Relations and Employment Creation is aimed at ensuring harmonious labour relations through promoting social justice, occupational health and safety and enhanced labour market services for the benefit of all Namibians. This ministry insures effective implementation of the Labour Act No. 6 of 1992.	The Proponent should ensure that the prospecting and exploration activities do not compromise the safety and welfare of workers.

4.3 International Policies, Principles, Standards, Treaties and Conventions

Given the fact that the proposed project is likely to be funded by international investors and the financing require the project to comply with certain requirements. Therefore, it is crucial to include the relevant legal requirements in this ESA Study and these are listed below:

- Equator Principles (EP):
  - *EP1: Review and Categorization*
  - *EP2: Environmental and Social Assessment*
  - *EP 3: Applicable Environmental and Social Standards*
  - *EP 4: Environmental and Social Management System and Equator Principles Action Plan*

  - *EP5: Stakeholder Engagement*
  - *EP6: Grievance Mechanism*
  - *EP7: Independent Review*
  - *EP8: Covenants*
  - *EP9: Independent Monitoring and Reporting*
  - *EP10: Reporting and Transparency.*
- International Finance Corporation (IFC) Performance Standards (PS):
  - *PS1: Assessment and Management of Environmental and Social Risks and Impacts*
  - *PS2: Labour and Working Conditions*
  - *PS3: Resource Efficient and Pollution Prevention and Management*
  - *PS4: Community Health and Safety*
  - *PS5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement*
  - *PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources*
  - *PS7: Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities*
  - *PS8: Cultural Heritage*
  - *PS9: Financial Intermediaries (FIs)*
  - *PS10: Stakeholder Engagement and Information*
- The United Nations Convention to Combat Desertification (UNCCD) 1992
- Convention on Biological Diversity 1992
- Stockholm Declaration on the Human Environment, Stockholm (1972)

Other relevant international Treaties and Protocols ratified by the Namibian Government are:

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

In addition to the project description, alternatives, and legal framework, it is also important to note that the proposed project activities will be undertaken in a specific environment, in terms of biophysical and social. Therefore, understanding these existing environmental features before the project activities, is crucial for the assessment of the potential impacts stemming from the project activities on the features.

5 BIOPHYSICAL AND SOCIAL BASELINE

The proposed exploration activities will be undertaken in specific environmental and social conditions. Therefore, understanding the pre-project conditions of the environment will aid in describing the status quo versus future projections of environmental conditions once the project is implemented. The baseline information also aids in identifying the sensitive environmental features and how best suitable management and mitigation measures can be recommended for implementation. The summary of selected biophysical and social baseline information about the project area is given below.

The baseline information presented below is sourced from site visit, online sources ranging from old reports, books and publishing as well as other relevant research information in the broader area. The project baseline that is deemed necessary to the project activities are as follows.

5.1 Biological Environment

5.1.1 Fauna

Due to the fact that the farms overlain by the EPL are commercial, the area or farms are homes to mainly wildlife. The area is mainly a conservation area which is home to some wildlife as well as few domestic animals. The common wildlife in the area and wider area are giraffes (*Giraffa camelopardalis*), zebras (*Equus quagga*), steenboks (*Raphicerus campestris*), ostriches (*Struthio camelus*), gemsboks (*Oryx gazelle*) and kudus (*Tragelaphus strepsiceros*).

5.1.2 Flora

The EPL area is within the Karas Dwarf Shrubland Vegetation Type in southern Namibia, with the dominant structures being grassland and low shrubs. The plant endemism in the project area is determined in the range of 2 to 5 species (Mendelsohn *et al*, 2002). In terms of vegetation structure (the dominant and most prominent forms of plant present), the EPL area is found within a sparse shrubland vegetation structure as shown on the map in Figure 5-1. This vegetation type is largely characterized by large, open expanses of grasslands dotted with *Acacia* trees. The trees are tallest in areas of deeper sands in the east, with plant growth becoming progressively shrubby further west where the soils are shallower and landscape is mostly hilly and rocky (Mendelsohn*, et al.,* 2002).

The flat hillsides of the area are typically dominated by Euphorbia, Aloe and Boscia species, and while on the plains, the dominant species include *Rhigozum trichotomum, Parkinsonia africana* and grasslands are dominated by Stipagrostis species. Larger drainage lines are vegetated with *Acacia erioloba, A. karroo, Tamarix usneoides, Euclea pseudebenus, Rhus lancea*, succulent shrubs such as *Euphorbia gregaria, Euphorbia guerichiana, Ficus cordata, Ficus ilicina* and others.

The sparsely vegetation, mainly small shrubs in the EPL area is shown in some photos in Figure 5-2.

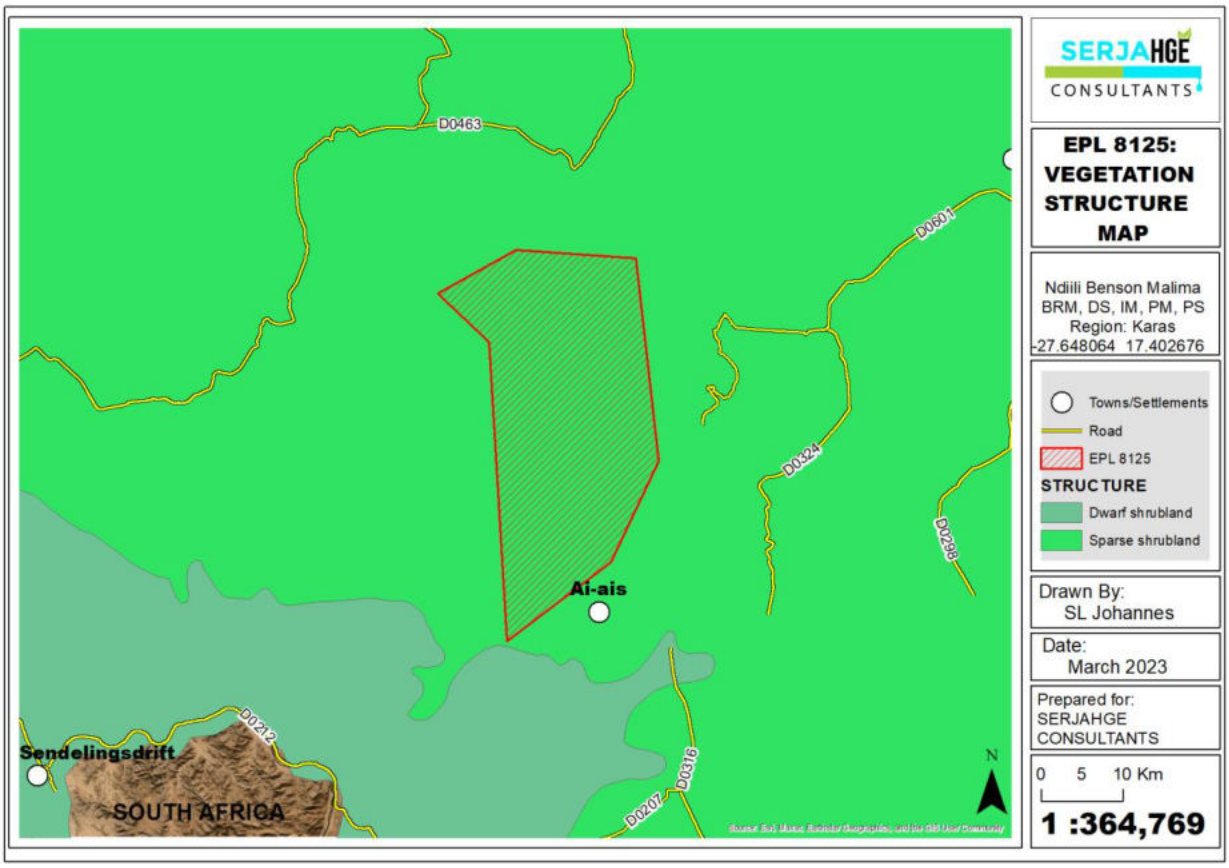

Figure 5-1: Dominant vegetation (sparse shrubland) map within the EPL

Figure 5-2: Some of the sparsely distributed in the EPL area

5.2 Physical Environment

5.2.1 Climate

The climatic conditions of the area overlain by the EPL are described using the available nearest data for Ai-Ais area obtained from World Weather Online and Meteoblue websites (2023). The area experiences average high temperatures of 36°C between November and January and low average temperature of 7°C around June/July (Figure 5-3).

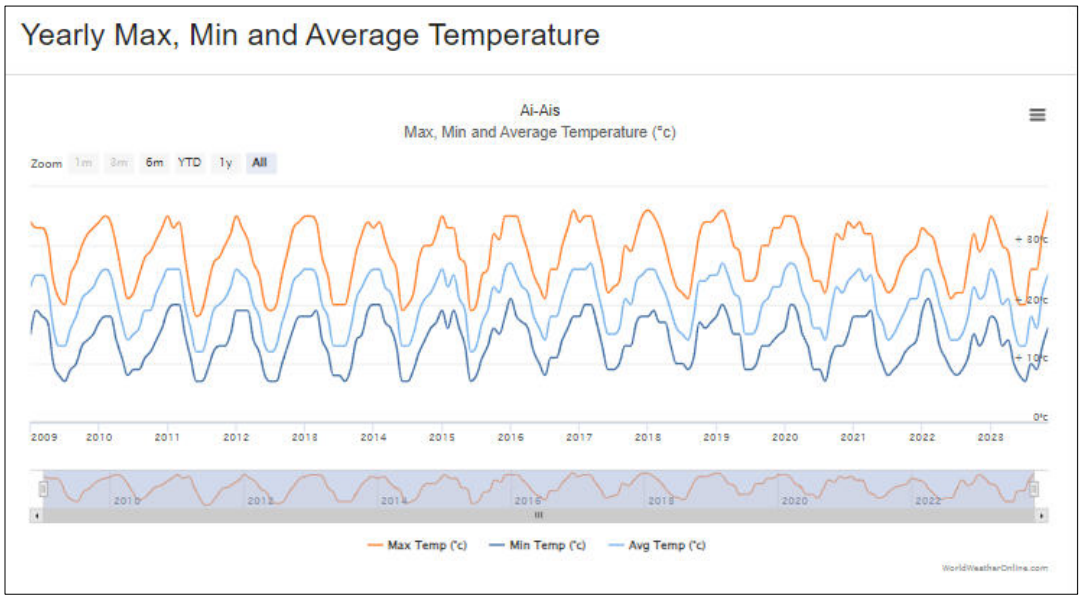

Figure 5-3: The annual maximum, minimum and average temperatures for the Ai-Ais area (World Weather Online, 2023)

The average low and high temperatures are 8°C and 34°C, respectively as shown in Figure 5-4.

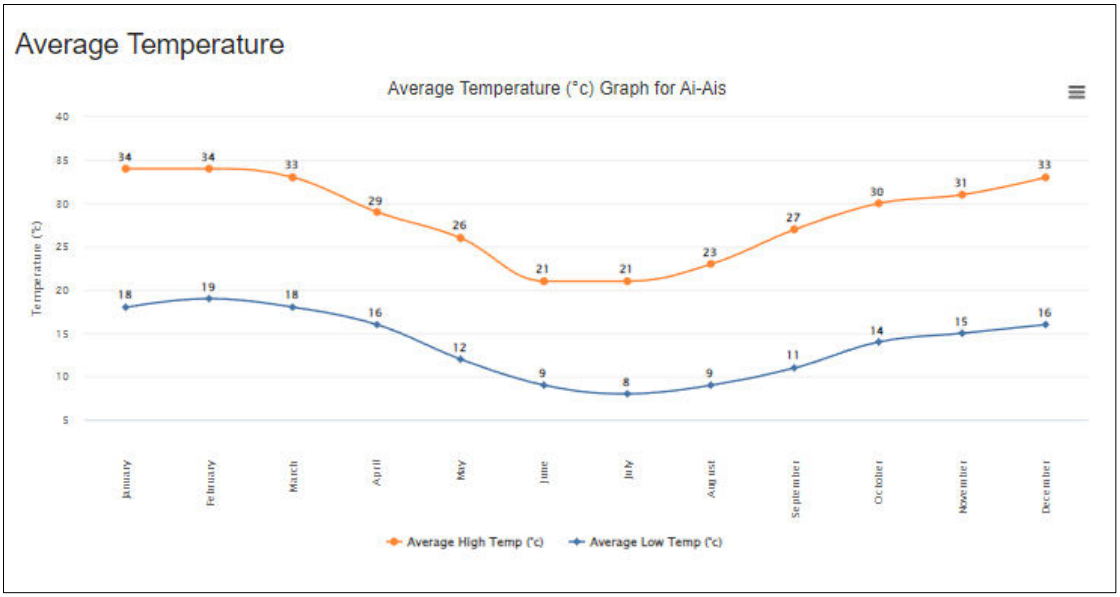

Figure 5-4: Monthly average temperatures for the Ai-Ais area (World Weather Online, 2023)

5.2.1.1 Rainfall

The Ai-Ais area and surrounding areas including the EPL area experience good rains between January and March, and according to World Weather Online (2023) annual rainfall graph (Figure 5-5.) for the 14-year period, the month of January received the highest rainfall of 132mm in 2011, followed by 131mm recorded in February 2011.

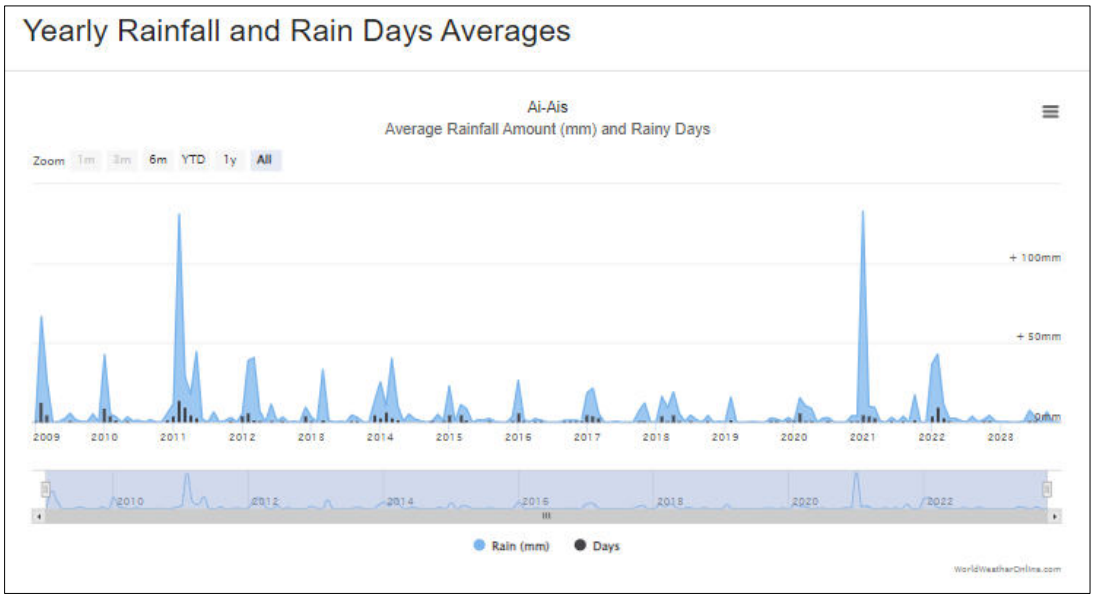

Figure 5-5: The annual rainfall and rain days averages for Ai-Ais area (World Weather Online, 2023)

The highest monthly average rainfall was recorded at 25mm in February when it rains for 5 days, followed by January with an average rainfall of 21mm (when it rained for 3 days) as shown in Figure 5-6.

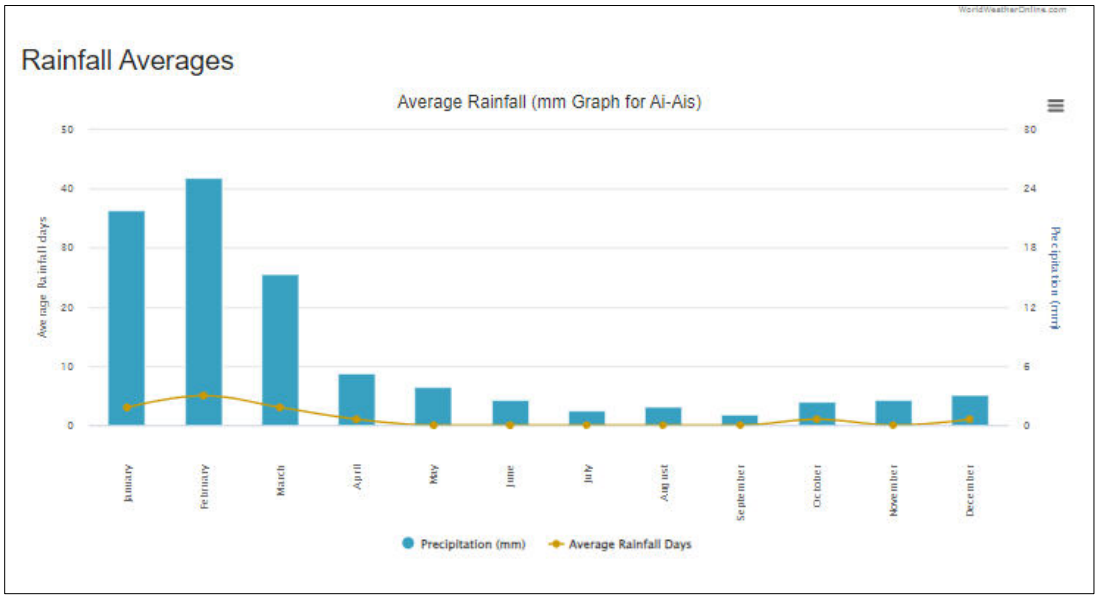

Figure 5-6: The monthly average rainfall for Ai-Ais area (World Weather Online, 2023)

5.2.1.2 Air Quality

The current known sources of air pollution in the area are dust emissions from unpaved district and access roads within the area, and emissions from heavy vehicles on the local roads, particularly in dry and windy months.

5.2.2 Topography and Landscape

The topography of the area is characterized by rocky hills and mountains with an elevation range of 0 and 960 meters above sea level (masl) (Mendelsohn et al., 2002).

From a landscape perspective, the EPL falls within three, namely the Orange River Valley, Gamkab Basin and Nama Karoo Basin as shown in Figure 5-7. According to Dauteuil et al (2015), the Orange River Valley marks a main boundary between a rather flat domain to the north and a dissected domain to the south. The inner plateau displays a smooth topography at an elevation of approximately 1,000masl with some mountain ranges reaching 2,200masl. To the northwest (intersecting the EPL corner) and further north, the bordering landscape is the Gamchab Basin which was formed by rivers eroding away the terrain to the north of the Orange River. These rivers flow and erode the landscape only sporadically after heavy falls of rain. The landscape is dominated by large, open valleys of gently sloping ground covered with a sparse layer of grass. There are many prominent dolerite sills in the Basin (Mendelsohn et al., 2002).

The Nama-Karoo Basin is defined by Mendelsohn et al (2002) as a large, flat lying plateau dominating much of southern Namibia. The sedimentary rocks deposited first in the Nama Basin and later in the same area in the Karoo Basin forming the foundations of the landscape. The basin slopes from the north, where elevations are about 1,400m above sea level to the south, where altitudes are approximately 900m above sea level.

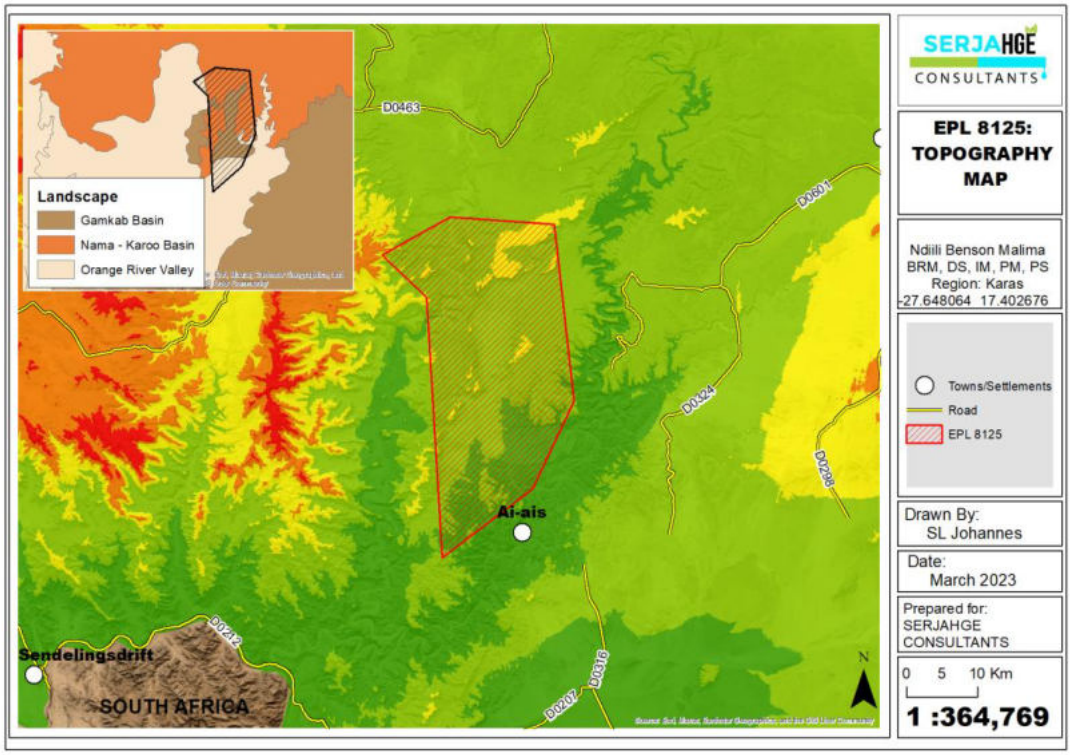

Figure 5-7: The landscape and topography of the EPL area

The topography (rocky hills and low mountains) inside the EPL are shown in Figure 5-8.

Figure 5-8: The topography within the EPL area

5.2.3 Geology and Soils

The geology of the area is characterised mainly by rock units of sandstone, black limestone, conglomerate and shale as well as undifferentiated metamorphic/intrusive rocks of the Namaqua Complex, and in minority, the pre-tectonic biotite rich augen gneiss - Figure 5-9.

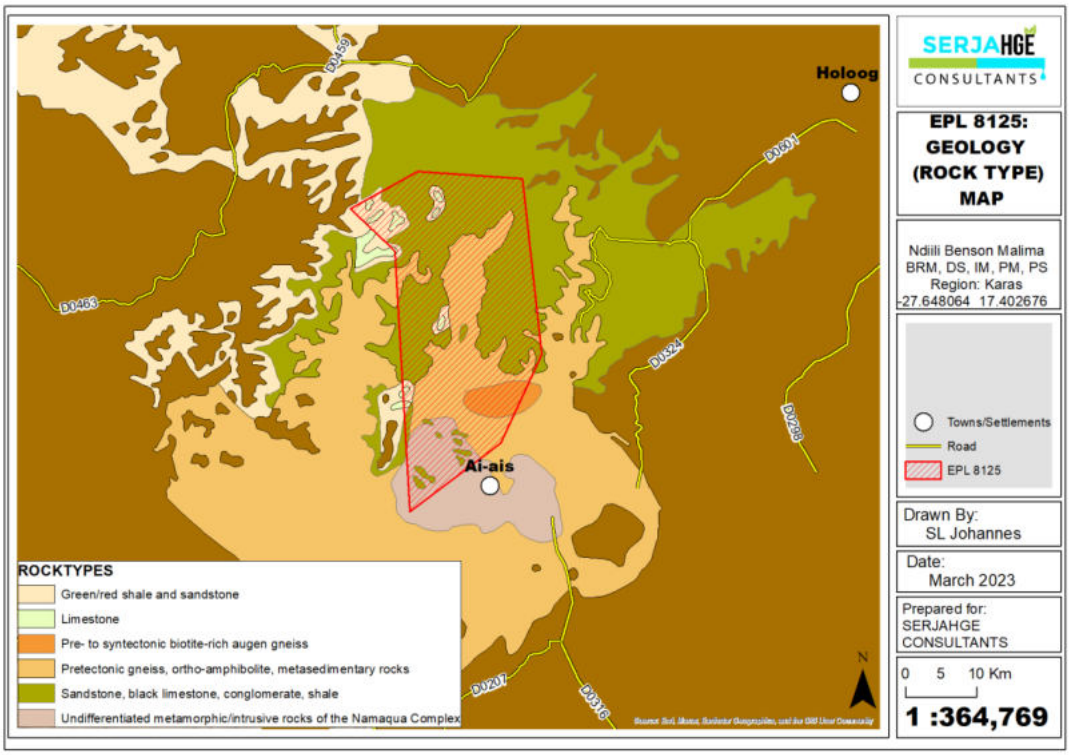

Figure 5-9: The geology of the EPL area

In terms of soil, EPL-8125 falls within three soil types (mainly lithic leptosols, petric calcisols and eutric regosols) as shown on the soil map in Figure 5-10. These soils types are described below as per Mendelsohn *et al* (2002):

- Lithic leptosols: lithic are very thin or shallow soils. The leptosol component of the soil name indicates that these soils typically form in actively from erosion landscapes, especially in hilly or undulating areas that cover much of the southern and north-western Namibia. The coarse-textured soils are characterized by their limited depth caused by the high presence of a continuous hard rock (Mendelsohn et al., 2002).
- Petric calcisols: petric soils have a solid layer at a shallow depth that remains hard even when wet. The calcisol component of the soil name indicates that these are found in depressions or other low-laying areas of the landscape, and typically contain accumulations of calcium carbonate, often in a cemented form called calcrete.

- Eutric regosols: these are medium or fined textured soils of actively eroding landscape, the thin layers lying directly above the rock surfaces from which they formed. Although not as shallow as the Leptosols, these soils never reach depths of more than 50cm. The central regions of the country are dominated by Regosols, which are especially susceptible to erosion where there is any degree of slope. The vegetation cover on these thin soils is generally sparse because they cannot provide most plants with sufficient water or nutrients. The areas with Eutric Regosols can support low-density stock farming or wildlife.

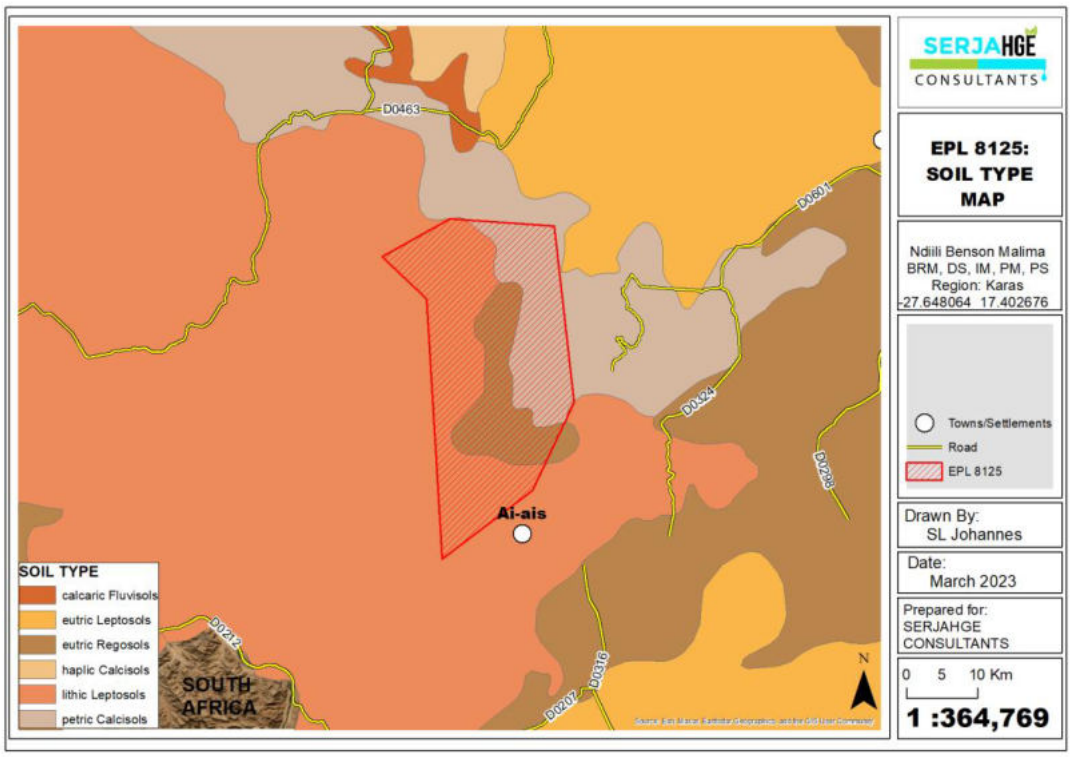

Figure 5-10: The dominant soil types found within the EPL

Typical soil found within the EPL are light brown and grey sandy gravel and calcrete covered by low-density grass and sparsely distributed small shrubs - Figure 5-11.

Figure 5-11: Typical soils observed in the EPL area

5.2.4 Water Resources: Groundwater (Hydrogeology) and Surface water (Hydrology)

With regards to groundwater (hydrogeology), the EPL falls within an area underlain by the rock bodies with little groundwater potential as shown on the map in Figure 5-12. The area will not be able to provide exploration activities with water supply from boreholes, particualry the actual exploration works such as drilling. Therefore, other existing and nearby reliable source of supply will be considered by the Proponent.

There are several small ephemeral rivers and streams running through and around the EPL as shown on the map below. It can also be seen that the EPL area have several existing boreholes drilled on the farms.

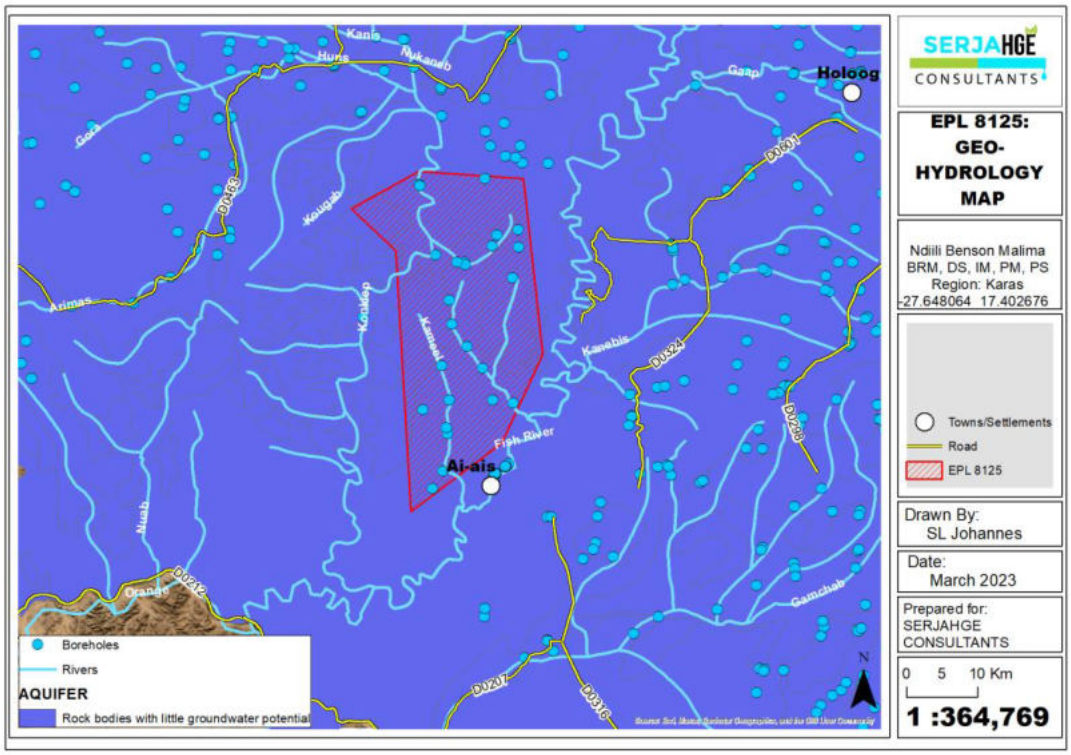

Figure 5-12: The surface and groundwater map of the EPL area

5.3 Social and Economic Environment

5.3.1 Demography

According to the 2011 Population and Housing Census, the //Karas Region had a population of 77,421 people comprising 38,014 females and 39,407 males (Namibia Statistics Agency, 2014). The Region is the least populated district (0.5 people per km^2) in Namibia (Namibia Statistics Agency, 2014).

The EPL area falls under the Oranjemund Constituency, which by 2011 had a population of 9,837 (4,460 females and 5,377 males).

5.3.2 Education and Employment

Regionally, according to the Namibia Statistics Agency (2014), the Region's 15+ age that never attended school was 5%, 24% was at school at the time of the Census, and 68% had left school.The Regional labour force (15+ year) of 75% indicated that the unemployed and unemployed population was 68% and 32%, respectively.

On a constituency level, according to the Namibia Statistics Agency (2014), the population of the Oranjemund Constituency's 15+ age was 2% (never attended school), 7% (at school at the time of the Census), and 90% (left school). The labour force (15+ year) of 88% indicated that the unemployed and unemployed population was 76% and 25%, respectively.

5.3.3 Economic Activities

The 2011 census shows that the main sources of household income in the Region were 7% farming, 72% wages & salaries, 5% cash remittance, 5% business, non-farming and 9% pension. On a Constituency level, the income was based on wages & salaries (87%), cash remittance (4%), business, non-farming (5%) and pension (1%).

5.3.3.1 Agriculture

The inland area of the EPL is dry and therefore, unsuitable for any agricultural nor farming activity.

5.3.3.2 Tourism

The //Karas Region is home to some tourist destinations in Namibia with various hospitality establishments and activities for tourists, visitors, and travellers alike. The EPL area is mainly a conservation environment, which is currently hosts eco-tourism activities.

5.3.3.3 Land Use

The EPL area is one of the driest part of the country and unsuitable for any agricultural activity, but highly suitable for eco-tourism, or as conservation or wilderness areas.

5.3.4 Archaeology and Heritage: Local Perspective

From a local context, and per the records of the National Heritage Council database, there is two recorded and mapped archaeological and heritage site within the EPL as shown in Figure 5-13 below.

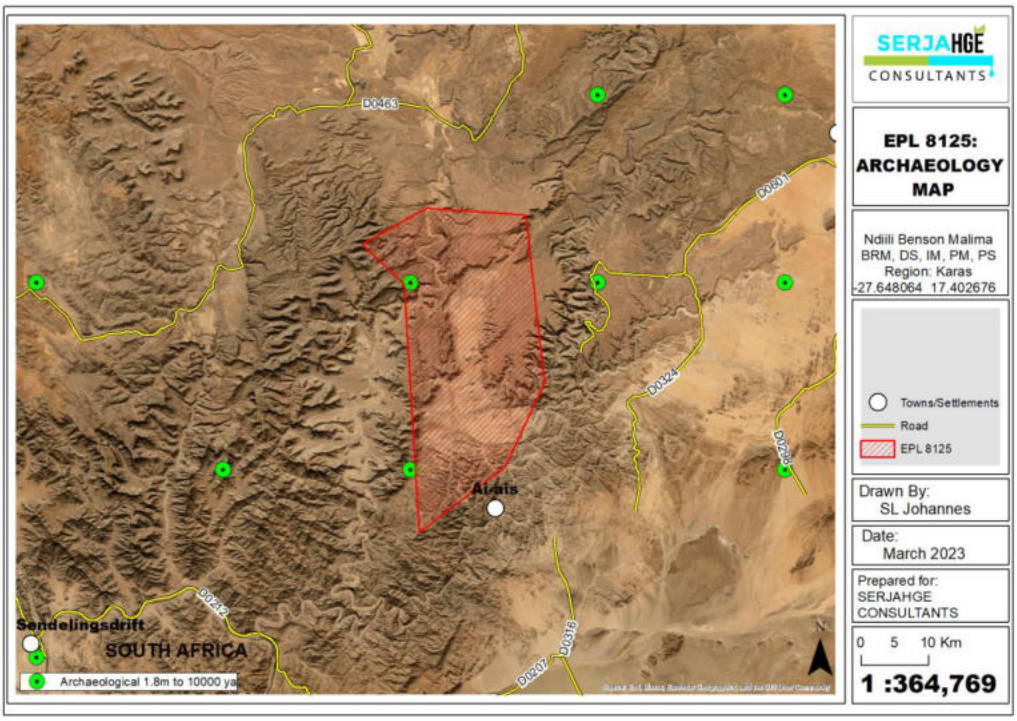

Figure 5-13: The archaeological map of the EPL area

According to TARO Consultants (2023), the archaeology of the study area remains unexplored and unknown to some extent. However, a little bit is known about the general history of the area surrounding Orange River , and thus, this archaeological assessment also draws on some reports and journals. Thanks to the work of early travellers, researchers, and contemporary archaeologists from both sides (SA & Namibia) such as J. Kinahan and others.

The archaeological and heritage resources found are within the Pleistocene to Holocene periods, the findings included but were not limited to graves and burial grounds or sites (stone cairns), several remains of nomadic pastoral encampments, historical or colonial sites, war and military activities sites, stone walls (fortified walls), bullet cases, horseshoe, rock shelters and caves, stone artefacts and related archaeological sites including geomorphological and geologic settings. These features can be archaeologically interpreted in a wider spectrum of events as well as contextual archaeology. Also the use of an old German map from the 1900s, the aim was to observe historical structures and colonial access routes, especially during and before the time of wars i.e. Germans colonial forces against Nama fighters, and Germans forces against Union of South African Troops.

The public consultation and engagement is presented under Chapter 6.

6 PUBLIC CONSULTATION AND PARTICIPATION PROCESS

Public consultation and participation form an important component of an EIA process. It provides potential Interested and Affected Parties (I&APs) and stakeholders with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. This greatly assist the EAP (Environmental Consultant) to thoroughly identify and record potential impacts and to what extent further investigations are necessary. Public consultation can also aid in the process of identifying possible mitigation measures.

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

Relevant and applicable national, regional, and local authorities, and other interested members of the public were identified. Pre-identified I&APs were contacted directly.

6.2 Communication with I&APs, and Means of Consultation Employed

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 regards to the proposed exploration activities was facilitated through the following means:

- A Background Information Document (BID) containing brief information about the proposed project was compiled and uploaded on the MEFT (ECC) Portal for project registration and shared with registered Interested and Affected parties (I&APs).
- Project Environmental Assessment notices were published in The Namibia Media Holdings' *Market Watch newspapers* (*Allgemeine Zeitung*, *Die Republikein, and Namibian Sun*) dated 30 March 2023 and 05 April 2023 – Appendix C. The adverts provided a brief of the activity, locality, inviting members of the public to register as I&APs and submit their comments/concerns.
- After the newspaper adverts, attempts (telephone and email communication) were made with regional and local stakeholders (constituency) and MAWLR's Land Reform Department in May 2023 to assist in obtaining the contact details for the farmers/landowners affected by the EPL, but to no avail. Proofs of these attempts/efforts are attached hereto as Appendix D.

The public consultation which entailed the submission of comments and registration as I&APs started on the 30th of March 2023 until the 02nd of May 2023 as indicated in the newspaper adverts (Appendix C). No significant comments were submitted to Serja Consultants.

The following chapter is a presentation of the identified impacts, their description, assessment methodology, and assessment.

7 IMPACTS IDENTIFICATION, ASSESSMENT AND MEASURES

7.1 Identification of Potential Impacts

The proposed project and its associated activities are usually associated with different potential positive and negative impacts. For an environmental assessment, the focus is placed mainly on the negative impacts that are likely to affect the host environmental and social features. The assessment is done to ensure that these impacts are sufficiently addressed, and adequate mitigation measures are recommended thereto for implementation so that an impact's significance is brought under control, while maximizing the positive impacts. The potential positive and negative impacts that have been identified from the prospecting activities are listed as follow:

Positive impacts:

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

Negative:

- Physical land / soil disturbance
- Impact on local biodiversity (fauna and flora); potential illegal harvesting of protected vegetation and habitat disturbance in the area
- Illegal wildlife hunting (poaching) and livestock theft on farms
- Potential impact on water resources and soils particularly due to pollution,
- Visual impact from unrehabilitated explored areas on the EPL may pose as an eyesore to travellers (including tourists) using the local access roads.
- Air quality issue: potential dust generated from the project activities such as drilling, possibly trenching and movement of heavy trucks on unpaved access roads.
- Potential occupational & social health and safety risks (trenches and drilled holes risk to animals and people).

- Accidental fire outbreaks related to the project activities.
- Vehicular traffic safety and impact on services infrastructure such as local roads
- Vibrations and noise associated with drilling activities may be a nuisance to locals.
- Environmental pollution (solid waste and wastewater).
- Archaeological and heritage resources impact (during trenching and drilling).
- Potential social nuisance and conflicts (theft, damage to properties, etc.).

7.2 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 7-1.

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 (in Table 7-1) were applied in this impact assessment:

Table 7-1: Criteria used for impact assessment (extent, duration, intensity and probability)

The Criteria used to assess the potential negative impacts				
Extent or (spatial scale) - extent is an indication of the physical and spatial scale of the impact.				
Low (1)	**Low/Medium (2)**	**Medium (3)**	**Medium/High (4)**	**High (5)**

The Criteria used to assess the potential negative impacts				
Impact is localised 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
Duration- Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project				
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
Intensity, Magnitude / severity - Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. This a qualitative type of criteria				
H-(10)	**M/H-(8)**	**M-(6)**	**M/L-(4)**	**L-(2)**
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.
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				
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.

7.3 Impact 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 chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors (Table 7-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

SP = (magnitude + duration + scale) x 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 7-2).

Table 7-2: Impact significance rating scale

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

For an impact with a significance rating of high, mitigation measures are recommended to reduce the impact to a low or medium 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 project phases is done for both pre-mitigation (before implementing any mitigation) and post-mitigation (after mitigations are implemented). The objective with the mitigation measures is to firstly avoid the risk and if the risk cannot be avoided, mitigation measures to minimize the impact are recommended. Once the mitigation measures have been applied, the identified risk will be of low significance.

7.4 Description and Assessment of Potential Impacts

The potential impacts from the proposed project activities are described, and assessed in Table 7-3. The management and mitigation measures are in a form of management action plans are provided in the Draft EMP.

Table 7-3: The Description and Assessment of the impacts of exploration activities on the biophysical and social environment

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Positive Impacts											
Employment creation	Although temporary, the project activities will create employment to some locals from sampling throughout to drilling. This will include casual labourers, technical assistants, cooks, etc.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75
Land access use fees to farmers for socio-economic development	Payment of land use fees to the farmers in accordance with the Mining Act would generate an income for their farms and families during exploration duration.	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M / H - 4	H - 5	M - 6	H - 5	H - 75
Empowerment of local businesses	Procurement of local goods and services (such as site clearing, cleaning, etc.) by local business will promote local entrepreneurship empowerment and local economic development (income generation).	L / M- 2	L / M - 2	L / M - 4	L / M - 2	L - 16	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44
Donating of water boreholes	During drilling, it is likely that groundwater would be encountered in some exploration	L / M- 2	L / M - 2	L / M - 4	L - 1	L - 8	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
from exploration drilling and improving some farm infrastructures	holes. Therefore, the Proponent will notify the farmer and boreholes donated to respective farmer(s) for their own use. Where access needs to be improved, such as farm sections areas with small gates for some exploration vehicles and machinery, new gates will be installed by the Proponent, with the farmer's consent.										
Negative (Adverse) Impacts											
Disturbance to grazing areas on the EPL	The EPL is overlying commercial farms that practice livestock and game farming, therefore, the invasive exploration activities such as site clearing, trenching, and drilling can potentially lead to the disturbance of grazing land. This will potentially affect the grazing areas available to the farms' livestock and wildlife, and since the farmers greatly depend on these types of farming for subsistence and commercial purposes (income generation), this would have an impact on their livelihood through potential grazing for animals.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	Losing grazing pastures for livestock and wildlife minimizes the number of animals on the farms and overall farming activity in the area, and lead to loss of livelihoods. However, the preliminary exploration target areas for exploration will be focusing towards the western bottom corner of the EPL, therefore, most of the EPL area will be undisturbed.										
Physical disturbance to the site soils	The excavations and land clearing to enable siting of project structures and equipment will potentially result in soil disturbance which will leave the site soils exposed to erosion. This impact would be probable at site areas with no to little vegetation cover to the soils in place. The movement of heavy vehicles. The movement of heavy vehicles and equipment may lead to compaction of the soils during exploration. This will, however, be a short-term and localized impact.	M - 3	M / H - 4	L / M - 4	M / H - 4	M – 44	L / M - 2	L / M - 2	L / M - 4	L / M - 2	L - 16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Impact on Biodiversity: Wild Fauna and Flora	Fauna: The EPL falls within an ecologically sensitive area. Therefore, if activities such as trenching and drilling activities are not carefully conducted, this would result in land degradation. The degradation would lead to habitat loss for a diversity of flora and fauna onsite. However, exploration activities will be limited specific target areas only within the EPL. The presence and movement of the exploration workforce and operation of project equipment and heavy vehicles would disturb not only livestock grazing at the explored sites of the EPL, but also the wildlife present on the farms. Not only the disturbance due to human and vehicle movements, but also potential illegal hunting (poaching) of local wildlife by project related workers. This could lead to loss or number reduction of specific faunal species which also impacts tourism in the community.	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	Flora: Vegetation would be impacted through clearing to create exploration access roads, setting up project equipment and infrastructures, and actual exploration activities such as sampling, drilling, and trenching. Drilling activities may potentially impact vegetation through the fallout dust settling on the leaves of the plants, hindering, or preventing photosynthesis, which eventually affects the grazing of herbivores on the farms. The clearing of vegetation, where deem necessary will be limited to the specific route and minimal, therefore, the impact will be localized, site-specific, therefore manageable.										
Air Quality: Dust Generation	There is a potential impact of dust emanating from site access roads when transporting exploration equipment and supply to and from site. This may compromise the air quality in the area. Additionally, activities carried out as part of the	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	exploration works such as drilling would contribute to the dust levels in the air.										
Visual impact: Scenic view of the area for Tourism	The sight of unrehabilitated site areas may be an eyesore to both locals, tourists and travelers alike on local access roads such as D0324, D0601 and D0207 (owing to long-distance visibility in the open area and little vegetation). The presence of exploration vehicles (trucks) and camp sites close to roads may be a nuisance to locals and tourists. This impact is considered minimal as the activities will be short-term during exploration, and the impact will be negligible.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16
Water Resources Demand and Use	The abstraction of more water than it can be replenished from low groundwater potential areas would negatively affect wildlife watering in the area that depend on the same low potential groundwater resource (aquifer). The impact of the project activities on the resources would be dependent on the water	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	volumes required by each project activity. Given the fact that the EPL area is underlain by rock units with low groundwater potential, the Proponent will be carting water for drilling from outside the area and store it in industry standard water reservoirs/tanks on site and refilled as required. The required water would also be dependent on the duration of the exploration works and number of exploration holes required to make reliable interpretation on the commodity presence explored for during exploration. Therefore, the impact will only last for the duration of the exploration activities and ceases upon their completion.										
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 groundwater and surface water. The anticipated potential source of pollution to	M: -3	M: -3	M: -6	M / H: 4	M: -48	L / M: -2	L / M: -2	L / M: -4	L / M: 2	L: -16

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	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 these machinery, vehicles and equipment could be washed in surface water bodies such as rivers and streams. The pollution may eventually infiltrate into the ground and pollute the fractured or faulted aquifers. This impact would occur during heavy rainy season when surface runoff would be inevitable. 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.										
Waste Generation	Waste types such as solid, wastewater and possibly hazardous will be produced onsite during exploration. If the	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	L - 2	L / M - 2	L - 8

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
(Environmental pollution)	generated waste is not disposed of in a responsible way, land pollution may occur on the EPL or around the site. If solid waste such as papers and plastics are not properly stored or just thrown into the environment (littering), these may be consumed by animals on the farm which could be detrimental to their health. 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, biodegradable and non-biodegradable wastes will be stored in separate containers and collected regularly for disposal at a nearest recognized waste management facilities										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Occupational and Community Health and Safety Risks	Project personnel (workers) involved in the exploration activities may be exposed to health and safety risks. These are in terms of accidental injury, owing to either minor or major (i.e., involving heavy machinery or vehicles) accidents. The heavy vehicle, equipment and fuel storage area should be properly secured to prevent any harm or injury to the Proponent's personnel, farm residents and animals. Another potential risks to both people and animals within the EPL are unfenced exploration trenches or trenches that are not backfilled after completing the sampling works. Unsecured exploration trenches and even uncapped holes could pose a risk of people or animals falling into the open trenches leading to injuries. The use of heavy equipment, especially during drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	safety risk to the project personnel and locals too. Furthermore, considering the current unemployment rate of youth in Namibia, people from other areas in different regions may learn of the project and be forced to go look for work. The influx of people into the project area may also lead to sexual relations between these out-of-area workers and the locals. This would lead to the spreading of sexual transmitted diseases (i.e., HIV/AIDS) when engaging in unprotected sexual intercourse.										
Fire outbreaks	During exploration, there is a risk of accidental fire outbreaks related to the project activities. These could be from unattended open fire used for preparing food (if the drilling crew is accommodated onsite), smokers who are part of the exploration crews failing to completely put out their cigarettes which may result in a fire spreading over the farm areas and cause damage.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Vehicular Traffic Safety	The D0324, D0601, D0207 and others are the main transportation routes for all vehicular movement in the EPL. There would be a potential increase in traffic flow especially during the detailed exploration stage of the project activities, due to the delivery of supplies and services on site. These service and supplies will include but not limited to water, waste removal, procurement of exploration machinery, equipment, and others. Depending on the project needs, trucks, medium and small vehicles will be frequenting the area to and from exploration sites on the EPL. This would potentially increase slow moving heavy vehicular traffic along these roads. The exploration works will be undertaken in stages, on certain days of the week, few vehicles and the work will be temporary. Therefore, the risk is anticipated to be short-term, not frequent,	M - 3	M / H - 4	L / M - 4	M / H - 4	M - 44	L / M - 2	L / M - 2	L - 2	L / M - 2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	and therefore of medium significance.										
Impact on local road use	The project activities will mean an increased movement of heavy trucks and equipment on local roads which would exert more pressure on these roads. These local roads in remote areas are normally not in a good condition already for light vehicles, and the additional vehicles such as heavy ones may make it worse and difficult to be used by small (vehicles) that already struggled on the roads prior. This will be a concern if maintenance and care is not done during the exploration phase. The impact would be short-term (during exploration only) and therefore, manageable	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	M / L - 4	M / L -2	L - 12
Noise and vibration from drilling	There is a potential of noise from certain activities, especially drilling and trenching, which may be a nuisance to surrounding communities (farm houses) and farm animals. Excessive noise and vibrations without any protective measures in place can	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	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.										
Social Nuisance: Local Property intrusion and Disturbance or Damage	The presence of some out-of-area workers may lead to social annoyance to the local community. Not only out-of-area but locals too could intentionally trespass into private properties of the locals and damage them. The private properties of the farmers could be houses, unauthorized fences, or cause damage to animals (livestock and wildlife). The unpermitted and unauthorized entry to private properties resulting in property theft, vandalism (damage) may cause crashes between the affected property farmer(s) and the Proponent.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L - 1	M / L - 4	M / L -2	L - 12
Archaeological and	The potential impact on heritage resources would be through the	M / H - 4	M - 3	M - 6	M - 3	M – 39	L - 1	L / M - 2	L - 2	L / M -2	L - 10

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Heritage resources	inadvertent unearthing of buried objects especially during trenching and drilling. Not only unearthing but the destruction of rock engravings and rock painting on certain outcrops falling within the EPL would lead to a loss of heritage resources. There are no known or observed surface heritage sites or objects within the EPL. However, the absence of such resources on the surface does not mean that such or some such sites cannot be encountered during excavation works. Therefore, the necessary measures will be implemented. This includes the Chance Finds Procedure attached to the Draft EMP.										

7.5 Cumulative Impacts Associated with the Proposed Exploration

According to the International Finance Corporation (2013), cumulative impacts are defined as "those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones".

Similarly, to many other exploration projects, some of the cumulative impact to which the proposed project and associated activities potentially contribute are the:

- Poaching (illegal hunting of wildlife) and livestock theft: The issue of poaching in the area, some of which could be linked to people from outside the area, particularly the exploration crew. Similarly, livestock theft has been experienced in the area and sometimes associated with some farm workers too. Therefore, this impact is likely to continue with the introduced additional people (related to projects) in the area. Regardless, mitigations measures will need to be implemented to mitigate these impacts.
- Impact on road infrastructure: The proposed exploration activities will contribute cumulatively to various existing activities such as farming activities, and travelling associated with tourism, local daily routines and other road uses associated with existing mineral licenses and other projects in the area. The contribution of the proposed project to this cumulative impact is however not considered significant given the short duration, and local extent (site-specific) of the intended mineral exploration activities.
- The use of groundwater: While the contribution of this project to groundwater abstraction will not be significant (as the significant amount of water will be not abstracted from the EPL), mitigation measures to reduce water consumption during exploration are essential.

8 CONCLUSIONS

The ESA Study for the proposed exploration activities on EPL-8125 was undertaken in accordance with the EMA and its 2012 EIA Regulations. Some key potential positive and negative impacts were identified. The key negative impacts were described, assessed and appropriate management and mitigation measures made thereof for implementation by the Proponent, their contractors, and workers.

The public was consulted as required by Section 21 to 24 of the EIA Regulations by placing notices in three newspapers (*Allgemeine Zeitung, Die Republikein, and Namibian Sun*) dated 30 March 2023 and 05 April 2023.

Impact Assessment

Some key potential positive and negative impacts were identified. The key negative impacts were described, assessed and appropriate management and mitigation measures made for implementation (as provided in the Draft EMP). The potential negative impacts assessed have a medium and some with a slightly high rating significance. The significance of the adverse (negative) impacts cannot be avoided can be reduced to acceptable levels by the effective implementation of the recommended management and mitigation measures accompanied by implementation monitoring.

The summary of the assessed potential adverse impacts (based on impact significance rating) is provided below:

- Physical land / soil disturbance and impact on grazing areas: *pre-mitigation – medium, post-mitigation – low.*
- Biodiversity (fauna and flora); potential illegal harvesting of protected vegetation and wildlife hunting (poaching) and habitat disturbance in the area, impacting tourism: *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Impact on groundwater resources (over-abstraction/use): *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Water and soil pollution: *pre-mitigation - medium, post-mitigation – low*.
- Air quality (compromising surrounding air quality) - *pre-mitigation – medium, post-mitigation – low.*
- Visual impacts due to land scars owing to Dimension Stone exploration activities, resulting in the impact on tourism: *pre-mitigation – slightly high to medium, post-mitigation – low.*
- Occupational and community health, safety and security risks: *pre-mitigation – medium, post-mitigation – low.*
- Vibrations and noise associated with exploration trenching and drilling: *pre-mitigation – medium, post-mitigation – low.*

- Vehicular traffic safety & impact on services infrastructure (e.g., local roads): *pre-mitigation – medium, post-mitigation – low.*
- Environmental pollution (poor waste management): *pre-mitigation – medium, post-mitigation – low.*
- Archaeological and cultural heritage impact: *pre-mitigation – medium, post-mitigation – low.*
- Social nuisance and conflicts due to land use (theft, property damage, etc.) - *pre-mitigation – slightly high to medium, post-mitigation – low.*

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

- All the management and mitigation measures provided herein are effectively and progressively implemented, with commitment on Environmental monitoring through Bi-Annual EMP Compliance reporting by an Environmental Control Officer (ECO) and audited by an Independent Environmental Consultant. The monitoring of this implementation will not only be done to maintain the reduce impacts' rating or maintain low rating but to also ensure that all potential impacts that might arise during implementation are properly identified in time and addressed immediately.
- **The landowners should be consulted before commencing with the exploration activities in the area.**
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land access agreements, services provision agreements (water supply and waste disposal) to explore and ensuring compliance with these specific legal requirements.
- The Proponent, and their workers/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.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable. This includes the levelling of stockpiled topsoil, backfilling of exploration trenches and closing/capping of exploration holes.

To maintain the desirable rating and that the potential impacts are under control, the implementation of management and mitigation measures should be monitored by their Environmental Control Officer (ECO) and audited by an Independent Environmental Consultant on a bi-annual basis. The monitoring of this implementation will not only be done to maintain the reduce impacts' rating or maintain low rating but to also ensure that all potential impacts that might arise during implementation are properly identified in time and addressed immediately.

9 LIST OF REFERENCES

1. Dauteuil, O., Bessin, P. and Guilocheau, F. (2015). Topographic Growth around the Orange River Valley, Southern Africa: A Cenozoic Record of Crustal Deformation and Climatic Change. Rennes. HAL Open Science.
2. Mendelsohn J., Jarvis A., Roberts C., and Robertson T. (2002). Atlas of Namibia: A Portrait of the Land and its People. Cape Town: David Philip Publishers.
3. Namibia Statistics Agency. (2014). Namibia 2011: Population and Housing Census: Basic Analysis with Highlights – //Karas Regional Profile. Windhoek: Namibia Statistics Agency.
4. Resilient Environmental Solutions. (2019). Scoping Report for the Environmental Assessment Report for EPL-7264 near Talismanis in the Omaheke Region. Windhoek. Ministry of Environment, Forestry and Tourism.
5. Resilient Environmental Solutions. (2022). Environmental Monitoring Report for EPL-7415 in the Omaheke Region: Bi-Annual Monitoring of March 2022-Novemeber 2022. Windhoek. Unpublished.
6. World Weather Online. (2023). Ai-Ais - //Karas Region, Namibia Weather. Available from World Weather Online: https://www.worldweatheronline.com/ai-ais-weather-averages/karas/na.aspx