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Environmental Scoping Assessment (ESA) Study Report:

The Proposed Prospecting and Exploration Activities on Exclusive Prospecting License (EPL) No. 8770 near Opuwo in the Kunene Region, Namibia - An Application for Environmental Clearance Certificate (ECC)

MEFT Application No.: **APP-01698**

Document Version: **Final for Submission**

Proponent: **Tamarillo Investments (Pty) Ltd**
P. O. Box 22040 Windhoek, Namibia

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DOCUMENT INFORMATION

Title: Environmental Scoping Assessment (ESA) Study Report for the Proposed Prospecting and Exploration Activities on Exclusive Prospecting License (EPL) No. 8770 near Opuwo in the Kunene Region, Namibia – An Application for Environmental Clearance Certificate (ECC)

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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 Exclusive Prospecting License (EPL) No. 8770 near Opuwo in the Kunene Region, Serja Hydrogeo-Environmental Consultants cc declare that we:

- do not have, to our knowledge, any information or relationship with Tamarillo Investments (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: 05 September 2023

EXECUTIVE SUMMARY

Tamarillo Investments (Pty) Ltd (hereinafter referred to as the Proponent) had applied for the rights to prospect and explore on Exclusive Prospecting Licence (EPL) No. 8770 from the Ministry of Mines and Energy (MME) on the 17th of February 2022. The letter of intention to grant the EPL issued on the 30th f August 2022 by MME requires that an Environmental Clearance Certificate (ECC) is obtained first and submitted to the MME for consideration of EPL as shown on the Namibia Mines and Energy Portal (''pending ECC'').

The Proponent intends to prospect and explore for mineral commodities within the EPL boundaries, and these commodities are Base & Rare Metals, Dimension Stone, Industrial Minerals, Nuclear Fuel Minerals, Precious Metals, Precious Stones and Semi-Precious Stones. The 41,695.3434 hectare-EPL is located about 40km south of Opuwo in the Kunene Region.

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

Communication with I&APs with regards to the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed project was compiled and hand delivered to the Ministry of Environment, Forestry and Tourism (MEFT) accompanying the ECC application, and uploaded on the MEFT (ECC) Portal for project registration and shared with registered Interested and Affected parties (I&APs).
- A Stakeholders' (I&AP) List was developed and updated as new I&APs register for the ESA.
- Project Environmental Assessment notices were published in the *New Era* and *Windhoek Observer* newspapers on the 14th and 19th of July 2023. The consultation period ran from the 14th of July 2023 to the 11th of August 2023.

- A consultation meeting was scheduled and held with the local authorities (traditional authority) in Opuwo 03rd of August 2023 and public (in Kaoko-Otavi, and Ombahe Yakako) on the 05th of August 2023. Minutes were taken for both consultation meetings.
- Two A3 size posters were pasted at the Kunene Regional Council Office and in Kaoko-Otavi Settlement.

Some key potential positive and negative impacts were identified by the Environmental Consultant and based on issues raised by I&APs during the consultation period. The issues raised by the I&APs were addressed and incorporated into this Report whereby mitigation measures have been provided thereof in a form of action measures provide in the Draft EMP) to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described, assessed. The potential negative impacts indicated a medium rating significance. To minimize the significance, appropriate management and mitigation measures made thereof for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environmental and social components. The effective implementation of the recommended management and mitigation measures accompanied by monitoring will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low).

Recommendations and Conclusions

The public was notified as required by Section 21 to 24 of the EIA Regulations by placing adverts in three newspapers (*New Era* and *Windhoek Observer*) on 14 and 19 July 2023. The consultation period ran from 14 July 2023 to 11 August 2023. Consultation meetings were held and comments to the proposed project activities.

The comments were addressed and incorporated into this Report and Draft EMP.

The Scoping assessment (ESA) Study was deemed sufficient and concluded that no further detailed assessments are required to the ECC application for the prospecting and exploration activities.

Serja Consultants are confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures.

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.

- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use agreements, services provision agreements (water provision) to explore and ensuring compliance with these specific legal requirements.
- Transparency in communication and continued engagement with the communities and or through their leaders (traditional authorities) should be maintained before and throughout the project.
- The Proponent, their project workers or contractors comply with the legal requiresments 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, to their pre-exploration state. This includes the levelling of stockpiled topsoil, backfilling of exploration trenches and closing/capping of exploration holes.
- The EMP implementation onsite should be checked and done by the responsible team member onsite (Environmental Control Officer), and audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (Audit) Reports. These reports are to be submitted to the Environmental Commissioner at the DEAF – This will be required by the Environmental Commissioner (as part of the ECC conditions).

In conclusion, 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.

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Appendix B: Curriculum Vitae (CV) of the responsible Environmental Assessment Practitioner (EAP) - *uploaded separately as required*

Appendix C: EIA Notification in the newspapers (*New Era* and *Windhoek Observer*) - *uploaded separately as required under ''Proof of Consultation'' file*

Appendix D: Minutes from the Consultation Meetings with stakeholders / interested & affected parties (I&APs) - *uploaded separately as required under ''Proof of Consultation'' file*

Appendix E: Consent Letter issued by the Traditional Authority for the EPL - *uploaded separately as required under ''Consent or support document from relevant authority''*

LIST OF ABBREVIATIONS

Abbreviation	Meaning
AHIA	Archaeological & Heritage Impact Assessment
AQI	Air Quality Index
BID	Background Information Document
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CSR	Corporate Social Responsibility
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMA	Environmental Management Act

Abbreviation	Meaning
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
NACSO	Namibian Association of CBNRM (Community-based Natural Resource Management) Support Organisations
NHC	National Heritage Council (NHC) of Namibia
PPE	Personal Protective Equipment
Reg, S	Regulation, Section
VRHK	Vita Royal House of Kaokoland (Traditional Authority for the EPL area

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).

Term	Definition
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
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

Tamarillo Investments (Pty) Ltd (hereinafter referred to as the Proponent) had applied for the rights to prospect and explore on Exclusive Prospecting Licence (EPL) No. 8770 from the Ministry of Mines and Energy (MME) on the 17th of February 2022. The letter of intention to grant the EPL issued on the 30th of August 2022 by MME requires that an Environmental Clearance Certificate (ECC) is obtained first and submitted to the MME for consideration of EPL as shown on the Namibia Mines and Energy Portal (''pending ECC'') https://portals.landfolio.com/namibia/ - Figure 1-1.

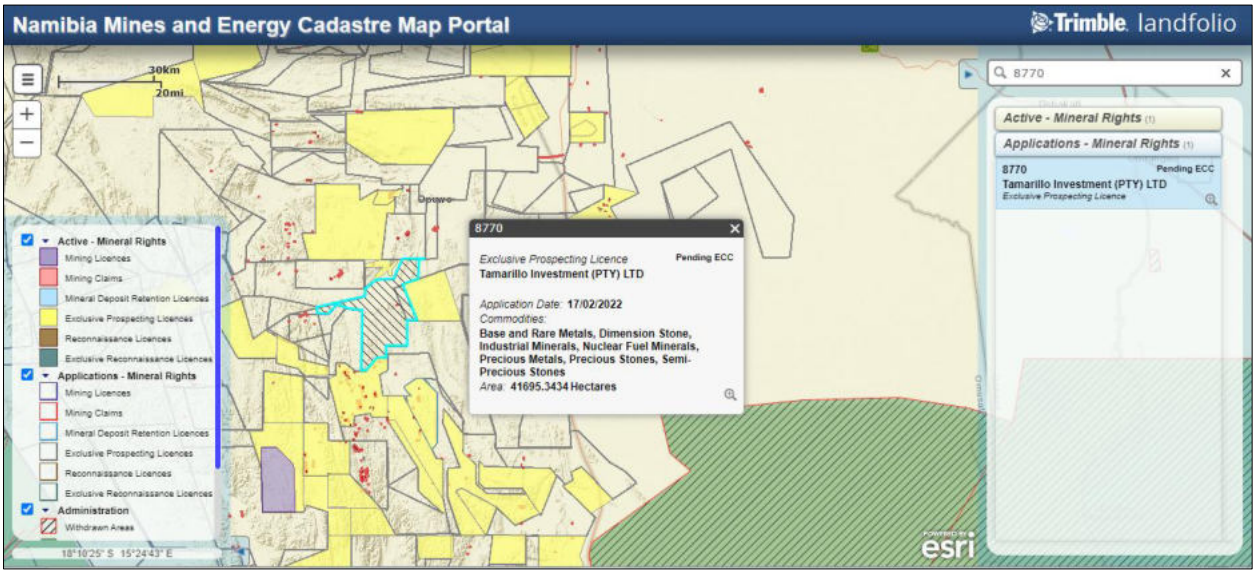

Figure 1-1: The status of EPL-8770 on the Namibia Mines and Energy Cadastre Map Portal (https://portals.landfolio.com/namibia/)

The Proponent intends to prospect and explore for mineral commodities within the EPL boundaries, and these commodities are Base & Rare Metals, Dimension Stone, Industrial Minerals, Nuclear Fuel Minerals, Precious Metals, Precious Stones and Semi-Precious Stones. The 41,695.3434 hectare-EPL is located about 40km south of Opuwo in the Kunene Region. The villages within the EPL are shown on the locality map in Figure 1-2.

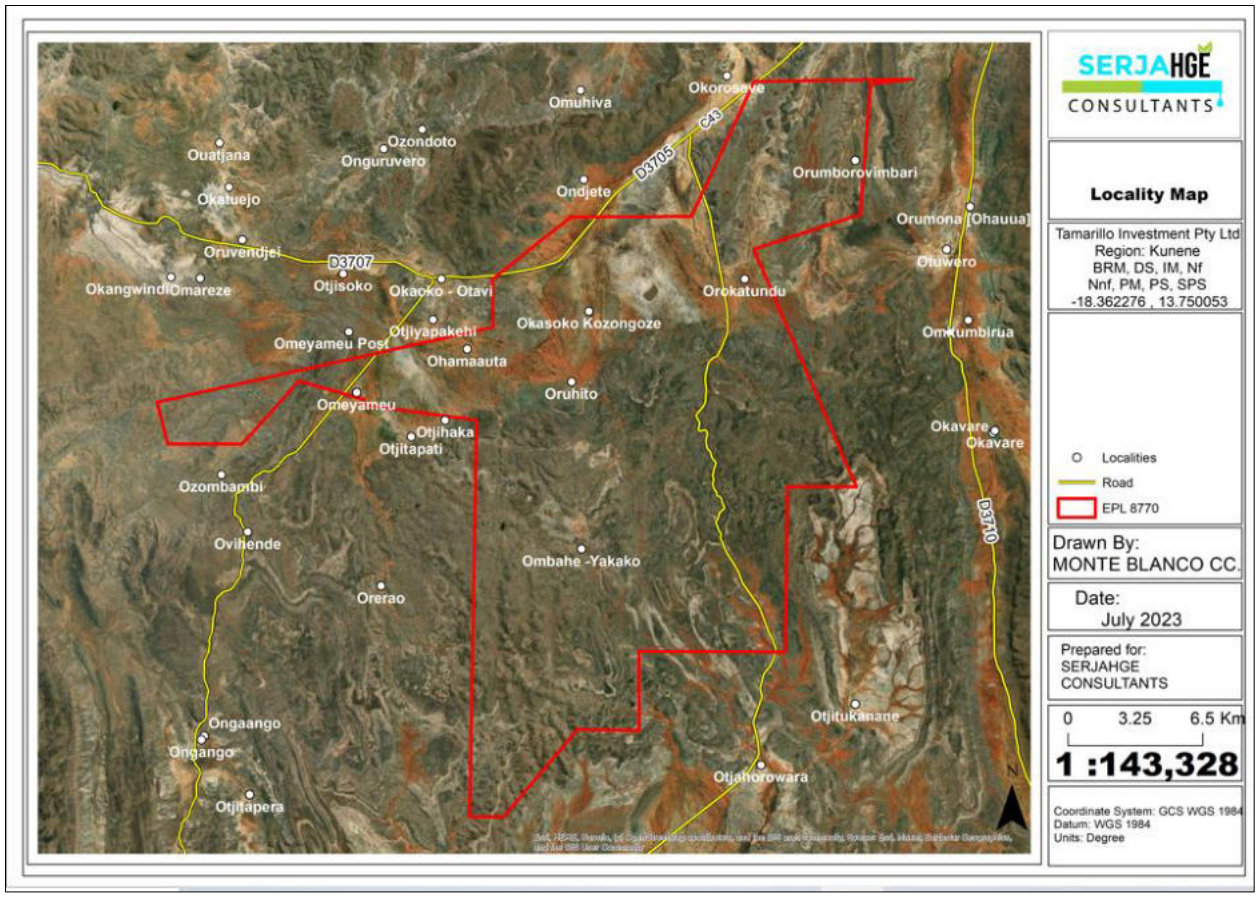

Figure 1-2: Locality Map of EPL-8770 near Opuwo

1.2 The Need and Desirability of the Proposed Project

The Proponent is committed to contribute to the socio-economic development of Namibia through different industrial sectors, which includes mining that contributes about 12% towards the country's Gross Domestic Product (GDP). The proposed prospecting and exploration activities on EPL-8770 has great potential to enhance and contribute to the development of other sectors and its activities provide temporary employment, taxes and levies as well as social responsibilities. Additionally, the industry produces a trained workforce and small businesses that can serve communities and may initiate related businesses. The successful exploration on the EPL would then lead to the mining of economic feasible commodity(ies) based on the results of exploration. This would contribute towards achieving the goals of the national development plans such as the National Development Plan 5 (NDP5) and Harambee Prosperity Plans (HPPs) I and II. Mining is therefore, essential to the development goals of Namibia in contributing to meeting the ever-increasing global demand for minerals, and for national prosperity. Thus, the need for exploration activities.

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 Appointed Independent Environmental Consultant

To comply with the EMA and its Regulations and ensure environmental management, protection, and sustainability, Tamarillo Investments 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) – Appendix A.

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 7 years' experience in Groundwater and Environmental Management Consulting. Her CV is attached to this Report as Appendix B.

1.5 Application for the Environmental Clearance Certificate

The application for the ECC process was done as follows:

- Preparation 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-01698),

- Completion of the Form 1 (Section 32) of the EIA Regulations with the required project and Proponent information,
- Submission of the printed hard copy of the ECC application (with affixed NAD300 revenue stamps as application fees attached hereto) is submitted to the MEFT. The MEFT's date stamped copy of the ECC application is uploaded on the ECC Portal as proof of application and payment.

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 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.

1.6 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. Furthermore, the ECC is required by the MME for consideration to renew the expired EPL rights.

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-8770), the Proponent will be required to sign land access and use agreements with the land custodians (the Traditional Authority). The Traditional Authority issued the consent letter to the Proponent during the EPL application (Appendix E) and also gave collective consent with the community during the ESA consultation meeting.

The proposed activities will be conducted at least 1.5km from villages, settlements and homes, i.e., a 1.5km buffer zone from environmentally and socially sensitive areas such as human settlements will be maintained during exploration. Therefore, no exploration activities will be undertaken within these buffer zones.

2.1 Duration of Mineral Exploration

The exploration programmes are based on an iterative, results-driven and phased nature. Therefore, it is not possible at an early stage of exploration to give exact areas for future drilling or an exact duration of the exploration activities (Resilient Environmental Solutions, 2019). Soil sampling programmes for instance may last from between one week to a month at a time over specific areas, until the explored area is fully sampled as desired. Drilling programmes 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.

In general terms, the minerals exploration activities can take up to a maximum of seven years, with different projects at various stages of the exploration phase (Resilient Environmental Solutions, 2019).

The Proponent intends to adopt a systematic and standard prospecting and exploration approach for the 2 exploration categories of the commodities (Base & Rare Metals, Dimension Stone, Industrial Minerals, Nuclear Fuel Minerals, Precious Metals, Precious Stones and Semi-Precious Stones) potentially occurring on the EPL. The exploration methods are presented under the subsections below.

2.2 Base & Rare Metals, Industrial Minerals, Nuclear Fuel Minerals, Precious Metals, Precious Stones and Semi-Precious Stones

Exploration activities are undertaken in a funnel-like system to narrow down exploration areas by sampling selected areas in the EPL that are taken to the laboratory for analyses, then followed up with trenching at sampled sites that showed good results. Samples collected during trenching at different layers of the trenches are taken to the laboratory for further analysis. The trenching works are then followed up with exploration drilling (commonly diamond drilling) to get detailed data or confirmation at depths.

2.2.1 Prospecting Stage (Non-Invasive Technique)

This stage of the project is known as 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.

Upon issuance of the ECC, prospecting during the advanced exploration phase will require the Proponent to assess the EPL area through detailed geological mapping, and geophysical surveys.

2.2.1.1 Geophysical surveys

This will entail data collection of the substrata (in most cases service of an aero-geophysical contractor will be soured), by air or ground, through sensors such as radar, magnetic and electromagnetic to detect any mineralization in the area and are conducted to ascertain the mineralisation.

Ground geophysical surveys shall be conducted, where necessary using vehicle-mounted sensors or handheld by staff members, while in the case of air surveys the sensors will be mounted to an aircraft, which then flies over the target area.

These surveys (mapping and as supported by geophysics) are crucial in defining targets for test pitting, trenching, and drilling. The exploration program will then commence with ground geophysical surveys.

2.2.2 Planned Exploration Methods (Invasive Techniques)

This stage (Detailed Field Evaluation) following the Non-Invasive techniques will be carried out by simple collection of soil and rock samples from target EPL areas to verify desktop/non-invasive information. These detailed techniques will include activities and as described under the next subsections (and details are presented in Table 2-1):

- Soil and rock sampling - collected and taken for trace element analysis to be conducted by analytical chemistry laboratories to determine if enough minerals of interest are present,
- Trenching – dug until bedrock to further investigate the mineral potential, and
- Exploration drilling (Reverse Circulation (RC) and diamond drilling) - This is done following the positive analyses by the laboratory led to the holes drilled, and drill samples collected for further analysis. This aids in determining the depth of the potential mineralization.

  A typical drilling site consists of a drill-rig, drill core and geological samples store and a drill equipment parking and maintenance yard (including a fuel and lubricants storage facility).

2.2.2.1 Lithology geochemical surveys

Rock and soil samples shall be collected and taken for trace element analysis to be conducted by analytical chemistry laboratories to determine if enough Base & Rare, Precious Metals or other minerals of interest are present. Also, trenches or pits may be dug depending on the commodity (in a controlled environment e.g., fencing off and labelling activity sites) adopting manual or excavator to further investigate the mineral potential.

Soil sampling consists of small pits (±20cm X 20cm X 30cm) being dug where 1kg samples can be extracted and sieved to collect a minimum of 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. At all times, the landowner/custodian and other relevant stakeholder will be engaged to obtain authorisation where necessary. A typical example of soil sampling in the field foe exploration is shown in Figure 2-1 below.

Figure 2-1: Typical soil sample collection and equipment (Resilient Environmental Solutions, 2019)

2.2.2.2 Detailed Exploration Drilling

Should analyses by an analytical laboratory be positive, holes are drilled, and drill samples collected for further analysis. This will determine the depth of the potential mineralization. If necessary new access tracks to the drill sites will be created and drill pads will be cleared in which to set up the rig. Two widely used drilling options may be adopted, these are either Reverse Circulation (RC) drilling and/or 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). Drilling activities on active EPLs are shown in Figure 2-2 and Figure 2-3.

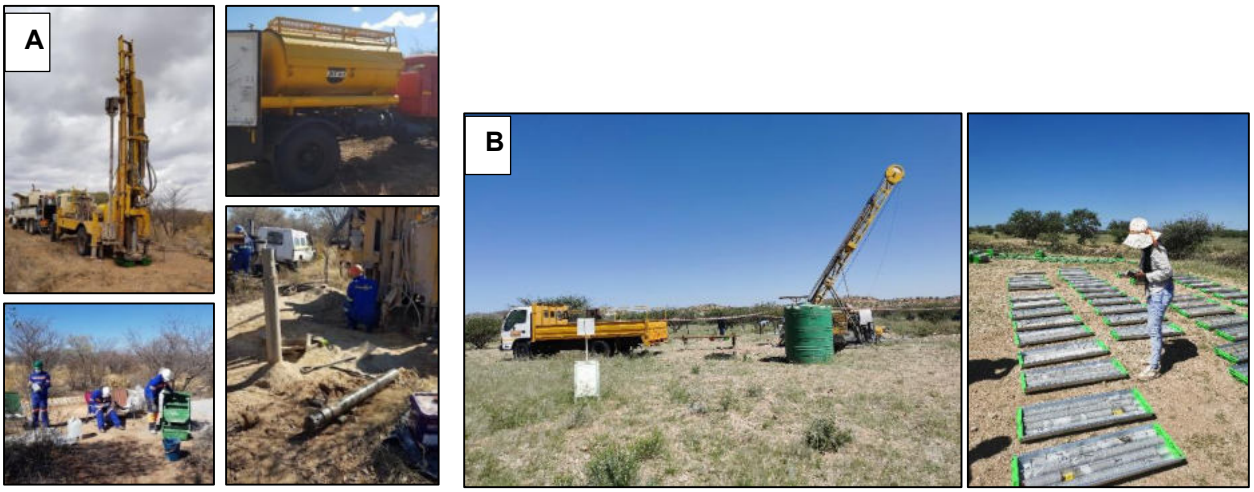

Figure 2-2: A-typical drill rig on an EPL (Resilient Environmental Solutions, 2019), B- drill rig on active EPL precious metals exploration site in Erongo Region (photo by Author, 2022)

Figure 2-3: A drill rig on an EPL in the Omaheke Region (Resilient Environmental Solutions, 2022)

2.3 Dimension Stone Exploration

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

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

The proposed activities are summarized as follows.

2.3.1 Desktop Study

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

2.3.2 Field Evaluation

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

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

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

Collectively, field evaluation and detailed geological mapping will result in the production of a refined and detailed geological map for the targeted sites on the EPL.

2.3.3 Detailed Exploration

The refined geological map would then assist in target generation for subsequent detailed exploration such as drilling. This is the primary method for detailed exploration, however, if necessary, the exploration method by removal of demonstration blocks will be considered

Exploration by removal or recovery of small exploration blocks from selected sides of a mountain or mountains wihtin the EPL would be carried out on select targeted areas of the EPL and shall be performed on as small areas as possible to minimize environmental impacts. In other words, an exploration block from 2 to 3m spot behind the selected mountain within the EPL / away from the local roads view. The outcomes / results of the test quarrying will be recorded and archived by the Proponent for future use (if and when mining will be considered depending on the outcome of exploration).

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

2.4 Exploration Resources, Services, Infrastructure and Associated Parameters

The summary of services, infrastructure and parameters for the project activities (anticipated per exploration stage) are provided in Table 2-1.

Table 2-1: The project resources (human), services, infrastructures and associated parameters required per project stage of activities on the EPL

	Mapping (Desktop)	Soil and Rock Sampling	Trenching	Exploration Drilling
Invasive / Intrusive (Yes/No)	No	Yes but shallow (20-30cm)	Yes. Excavated to the refusal depth of the excavator and depending on the ground conditions/geology or depth to the bedrock, usually ranging from 1 to 2m and length varies between 70 and 170m.	Yes. Usually until 200m deep but this will depend on the area.
Duration (months)	0.5 to 0.70 (2-3 weeks)	1 to 2 weeks (0.23-0.5months)	0.5-0.70 months (2-3 weeks)	More than 1 month, depending on the speed of the drill rig and ground conditions/geology
Sample weight (in kilograms (kg))	None	0.2 - 0.5kg (from small pits). Sample collection depends on the commodity being explored as this helps in determining how the mineral would be mined (when and if it happens).	1 to 2kg per distinct layer observed in the trenches.	1 to 2kg which would be stored in 50kg bags, because we would need to sample each meter of drilling for maybe 200m of each exploration hole
***Estimated number of workers on the EPL**	2 – 3 people	2 – 4 people	4 – 8 people	8 – 15 people**
Accommodation required onsite? (Yes/No). If yes, where?	No	Yes, but not in exploration camps yet (accommodation would be arranged in existing facilities)	Yes. Exploration camps from temporary / dismantable structures will be established onsite. The approval will be obtained from the Traditional Authority in collaboration with the respective Conservancies.	Yes. Exploration camps from temporary / dismantable structures will be established onsite. The approval will be obtained from the Traditional Authority in collaboration with the respective Conservancies
Number of vehicles (4x4 bakkies)	1 4x4 bakkie, rarely 2	1 -2 4x4 bakkies	2 4x4 bakkies	2 to 4 4x4 bakkies

	Mapping (Desktop)	Soil and Rock Sampling	Trenching	Exploration Drilling
Number of Heavy Trucks and/or Excavators	None	None	1 Excavator per EPL	1 Heavy truck per EPL (for the drill rig and associated equipment such as air compressors, biodegradable drilling mud, etc.)
Number of Fuel Tanks for generators and machinery	None	None	One (5,000-10,000 litre) on a trailer-mounted and bunded with a bowser	One (5,000-10,000 litre) on a trailer-mounted and bunded with a bowser
Other type of supporting equipment	GPS, mapping equipment/accessories	GPS, PPE, sampling bags, probes or augers, measuring tapes, etc.	GPS, appropriate PPE, sampling bags, bowsers, probes or augers, measuring tapes, etc.	GPS, PPE, sampling bags, drill core logging equipment, bowsers, etc.
Field water required? (Yes/No). If yes, what will it be used for?	Yes for drinking	Yes for drinking	Yes. Drinking, washing and toilets.	Yes. Drinking, washing and toilets, and actual drilling
Water volume per day and source of supply	In the field, about 50 litres in containers (for drinking only)	In the field, about 100 litres in containers (for drinking only)	About 1,500 litres Water will be stored in standard storage tanks. The source of supply will most likely be carted from Opuwo (via a NamWater agreement).	About 2,500 litres-10,000-25,000 litres of water to be stored in standard storage tanks. To be likely supplied via a NamWater.agreement.
Field power supply (equipment/machinery)	None	None	2 generators	2 to 3 generators
Field power supply (cooking)	None	None	10kg liquid gas cylinder cooker	10kg liquid gas cylinder cooker

**Note: The anticipated people will not be onsite at the same time as their presence will entirely depend on the stage of exploration, i.e., soil and rock sampling may only need two or three people, trenching five to six and then during drilling, the number may increase to fifteen (15) or slightly more people.*

***The number is bound to increase during this stage because there will be a need for drill rig/machine operator, supervisor, 1 or 2 logging geologists, geophysicist, exploration manager, geotechnical, sampling assistants, drill rig truck driver, cleaners, cooks, etc.*

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.

2.4.1 Accessibility (Roads)

The EPL area is accessible from the C43 from Opuwo that passes through the EPL. Where necessary, new access tracks will be created to access site specific areas on the EPL. Where necessary, and with the consent and guidance of the Traditional Authority, 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.

2.4.2 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 such as Opuwo, upon reaching a waste disposal agreement with the Town Council.
- 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 facility.

2.4.3 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 first aid administering.
- For safety, reasons, the exploration sites will be equipped with two-way radios and satellite phones for communication.
- 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 mainly wildlife in the area. Once sampling is completed, the trenches will be progressively backfilled and levelled and fencing removed for storage or donation to the land custodians for the communities. Similarly, for exploration boreholes that are no longer required after rock samples, they will be backfilled and closed off. Warning signage at hazardous site areas such as incomplete or active open trenches/holes will be erected and rehabilitation done as shown in Figure 2-4.

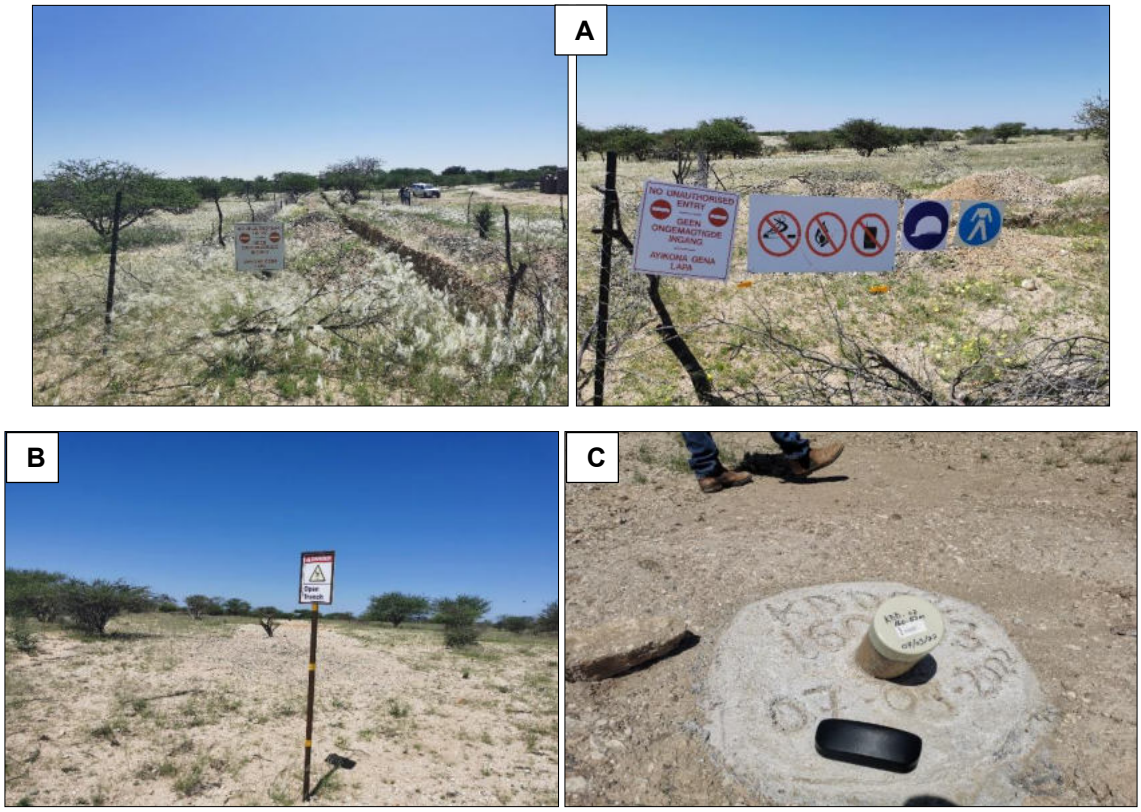

Figure 2-4: A- fenced off exploration trench awaiting backfilling upon completion of sampling, B – backfilled trench and C – capped exploration hole at an active exploration site visited by the Author in 2022

2.5 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.

Once the ECC is issued by the Environmental Commissioner, the Proponent will submit the ECC to the Mining Commissioner at the Ministry of Mines and Energy for consideration of granting the EPL. The prospecting and exploration activities will then be planned for and commence thereafter.

2.6 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), and economic geology. 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 (specific minerals).

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-8770 and other licenses are available on the Namibian Mines and Energy.

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. 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 different supporting infrastructures 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	-The project water 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 case of no favourable results of exploration).
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 within the EPL -Commuting from Opuwo which is about 40km away from the EPL.	-Set up temporary camps onsite (within the EPL boundaries), instead of commuting to and from Opuwo. The bad (gravel) roads and time needed to travel to the EPL area, would affect the works and eventual productivity. Therefore onsite camp (for trenching and drilling crew) would be feasible. An agreement to set up camp should be made with the Traditional Authority.

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 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 prospecting and exploration activities

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.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
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
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.	
Traditional Authority Act (Act No. 25 of 2000):	The Act also stipulates that Traditional Authorities (TAs) should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leadership, the Chiefs, to exercise control on behalf of the state and the residents in their designated area.	The EPL considered under this project is within the predominantly communal land under the Vita Royal House of Kaokoland Traditional Authority in Opuwo. Therefore, they should be consulted for the land use consent and engagement should continue throughout the Project.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
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.
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 Kunene Regional Council; therefore, they should be consulted.
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)).	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.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
	Liability of clean-up costs after closure/abandonment of an activity (S3 (l)). (l)).	
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.	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.
The National Monuments Act (No. 28 of 1969)	The Act enables the proclamation of national monuments and protects archaeological sites.	
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.	The proponent will apply for the relevant permit under this Act if it becomes necessary.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
	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."	
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.	
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.

Legislation / Policy / Guideline	Relevant Provisions	Implications for the project activities
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

4.3.1 International Finance Corporation (IFC) Standards

The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment.

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, particularly the International Finance Corporation (IFC) Performance Standards (PSs). Therefore, it is crucial to analyze the ESA Study process against these IFC's PSs and these are listed in Table 4-2.

Table 4-2: The IFC Performance Standards (PSs) analysis against EPL-8770 EIA Study

IFC PS	Relevant Provisions of the IFC PS	Implications for the project / Actions Taken
PS1	Assessment and Management of Environmental and Social Risks and Impacts:	The EIA has been undertaken in accordance with this, whereby the project has been advertised in the national media outlets, consultation meetings held and comments noted down for incorporation into the Assessment Report and Environmental & Social Management Plan together with identified potential adverse/negative and positive environmental and social impacts stemming from the project.
PS2	Labour and Working Conditions	The EIA/ESA Study assessed the potential impacts of the exploration activities on the exploration crew health and safety in accordance with the Labour Act (No. 6 of 1992) and fair labour working conditions, including compensations, i.e., no compromising of the labour and working welfare of workers as required in the EMP.
PS3	Resource Efficient and Pollution Prevention and Management	The Study assessed the usage of resources such as water, soils and power resources required for exploration works during that duration. The appropriate measures to manage and mitigate the impacts associated with the project activities have been provided under the EMP for implementation.
PS4	Community Health and Safety	The potential impacts of the exploration activities on the exploration crew as well as communities' health and safety in accordance with the Labour Act (No. 6 of 1992) have been assessed and mitigation measures provided accordingly in the EMP, i.e., ensuring that the prospecting and exploration activities do not compromise the safety and welfare of workers and communities.
PS5	Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement	The proposed EPL area is mainly communal land. Once the EPL certificate is issued by MME,

IFC PS	Relevant Provisions of the IFC PS	Implications for the project / Actions Taken
		The part of the EPL covering the communal/state land, a consent letter is issued by the area Traditional Authority which is submitted to the MEFT alongside the EIA/ESA Report. The structures and human settlements within the EPL will be avoided for exploration (with a 1.5km buffer), and since exploration is a short-term activity, no relocation or resettlement will be done. Therefore, PS5 is not considered applicable to the project at this stage.
PS6	Biodiversity Conservation and Sustainable Management of Living Natural Resource	The ESA Study undertook a baseline assessment of the fauna and flora in the project area. The relevant management and mitigation measures have been provided thereto in the EMP.
PS7	Indigenous Peoples/Sub-Saharan African Historically Undeserved Traditional Local Communities	The EPL falls within a communal land with communities practising mainly livestock farming. However, the larger area of the EPL is mainly used as a grazing area and people live/stay in and around Kaoko-Otavi Settlement and in the north-eastern villages in the EPL. The presence of indigenous people within the EPL has been explored during the EIA during consultation meetings (by enquiring with locals and traditional authority). However, there are no known indigenous people within the EPL boundaries.
PS8	Cultural Heritage	An Archaeological & Cultural Heritage Impact Assessment (AHIA) has been undertaken for the ESA Study by TARO Archaeological & Heritage Consultants (TARO Consultants). The baseline, impact assessment and mitigation measures have been done and compiled by TARO Consultants. The AHIA Report will be compiled for submission to the National Heritage Council of Namibia in accordance with the National Heritage Act No. 27 of 2004 and The National Monuments Act (No. 28 of 1969) to obtain a Heritage Consent Letter for exploration activities prior to commencement of the activities.

4.3.2 Other Application International Statues (Treaties and Conventions) and Policies

The other international statues such as policies, standards and conventions that may govern the project activities are provided under Table 4-3 below.

Table 4-3: Other international treaties and conventions governing the proposed activities on the EPL

Statue	Relevant Provisions	Implications for the project / Requirements
The United Nations Convention to Combat Desertification (UNCCD) 1992	Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change. The convention objective is to forge a global partnership to reverse and prevent desertification/land degradation and to mitigate the effects of drought in affected areas to support poverty reduction and environmental sustainability United Nation Convention	The project activities should not be undertaken such that they contribute to desertification.
Convention on Biological Diversity 1992	Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use. Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	The removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: “a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.
Equator Principles	A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.	These principles are an attempt to: ‘…encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.’

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

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 (done on the 05th of August 2023), 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

The description of the biological (faunal and floral) environment of the EPL area is presented below.

5.1.1 Fauna

The EPL area is mainly communal land with subsistence farming, which is done with large and small livestock such as cattle, donkeys, sheep, and goats. Some livestock observed within the EPL during the site visit are cattle (Figure 5-1), goats and some donkey faeces.

In terms of wildlife, the area is home to some wild animals such as zebras (seen closer to Sesfontein), Kudus and many Springboks seen along the C43 from Opuwo/Kaoko-Otavi side towards Sesfontein (Figure 5-1 D).

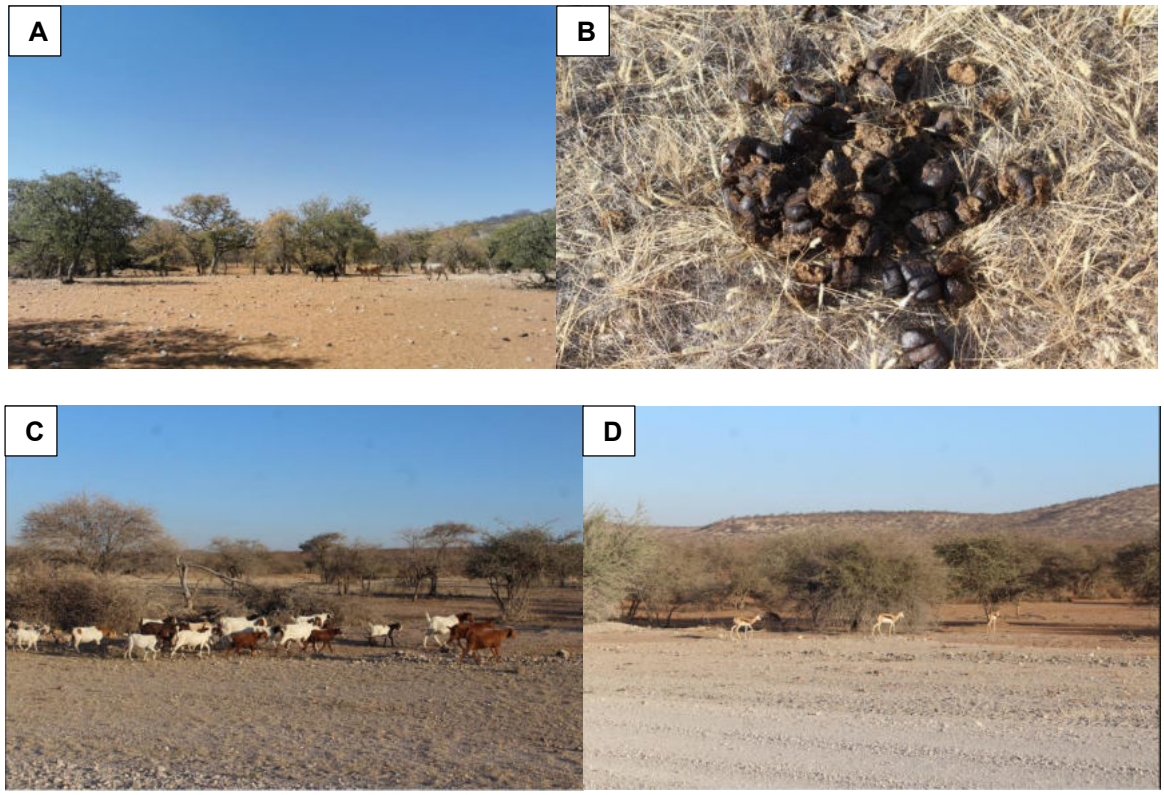

Figure 5-1: A – herd of cattle at Oruhito Village, B - donkey faeces near Ombahe YaKako, C- goats long the C43 and D – Springboks observed within the EPL along the C43

There were no observed wildlife during the site visit, but this does not imply their absence, as this would be due to the time limit spent on site, and time of the day when the site visit was done.

5.1.2 Flora

The vegetation structure of the Opuwo, Kaoko-Otavi areas and surrounding areas is characterized by woodlands, which are typical for northern Namibia (Mendelsohn *et al*., 2002). The dominant vegetation in the EPL area is woodland shrubs as shown on the vegetation map in Figure 5-2. The observed vegetation in the EPL area are shrubs and young trees of red-thorn/black-thorn camelthorns (*Vachellia reficiens and mellifera*), purple-pod cluster-leaf or purple-pod terminalia (*Terminalia prunioide*), mopane (*Colophospermum mopane*) as well as corkwood (*Commiphora*) species, shepherd's Tree (*Boscia albitrunca*) and African Baobab (*Adansonia digitata*). The camelthorn and mopane trees are protected

under the Forestry Act, therefore, a permit to remove them (if necessary) will be required. The baobab trees are also protected, however, their removal will not possible nor required (they should be avoided at all cost).

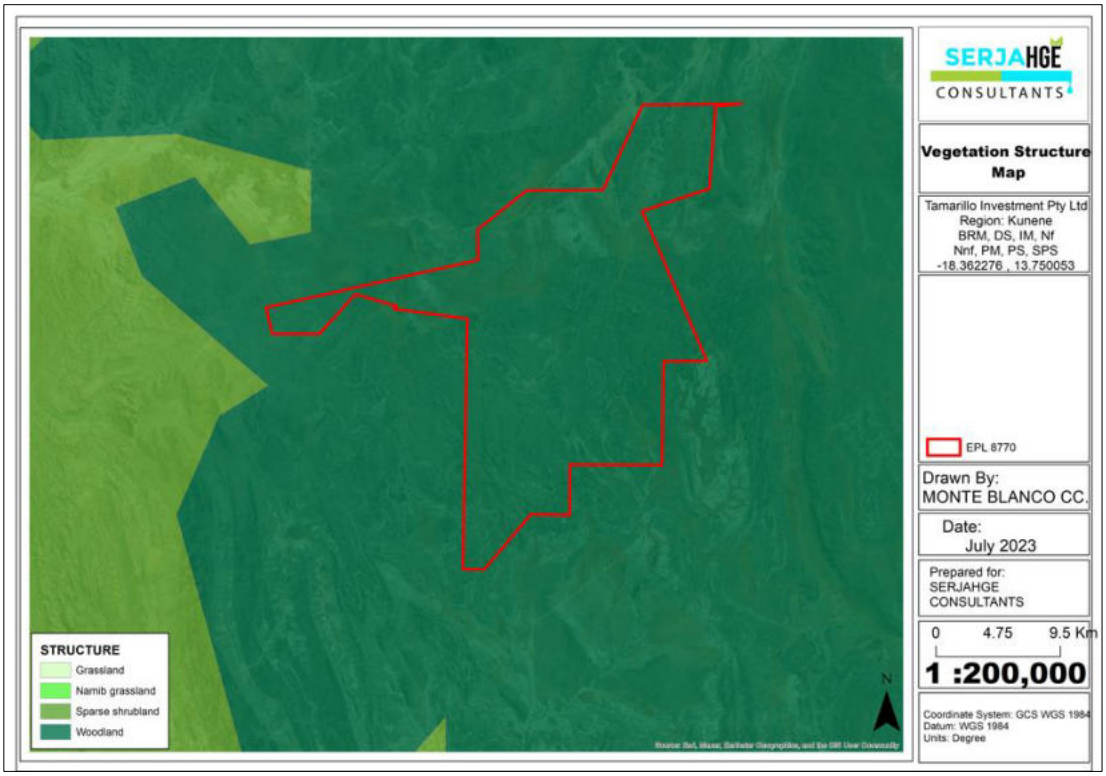

Figure 5-2: The vegetation structure map within and around the EPL

Based on the site visit, the following vegetation (apart from grass cover) were observed during the site visit (as per Figure 5-3):

- Red-thorn/black-thorn camelthorns (*Vachellia reficiens and mellifera*),
- Mopane (*Colophospermum mopane*),
- Purple-pod cluster-leaf or purple-pod terminalia (*Terminalia prunioide*),
- Cock-wood (*Commiphora*) species,
- Shepherd's Tree (*Boscia albitrunca*), and
- African Baobab tree (*Adansonia digitata*) mainly on the eastern side of the EPL (along the C43 Opuwo-Sesfontein).

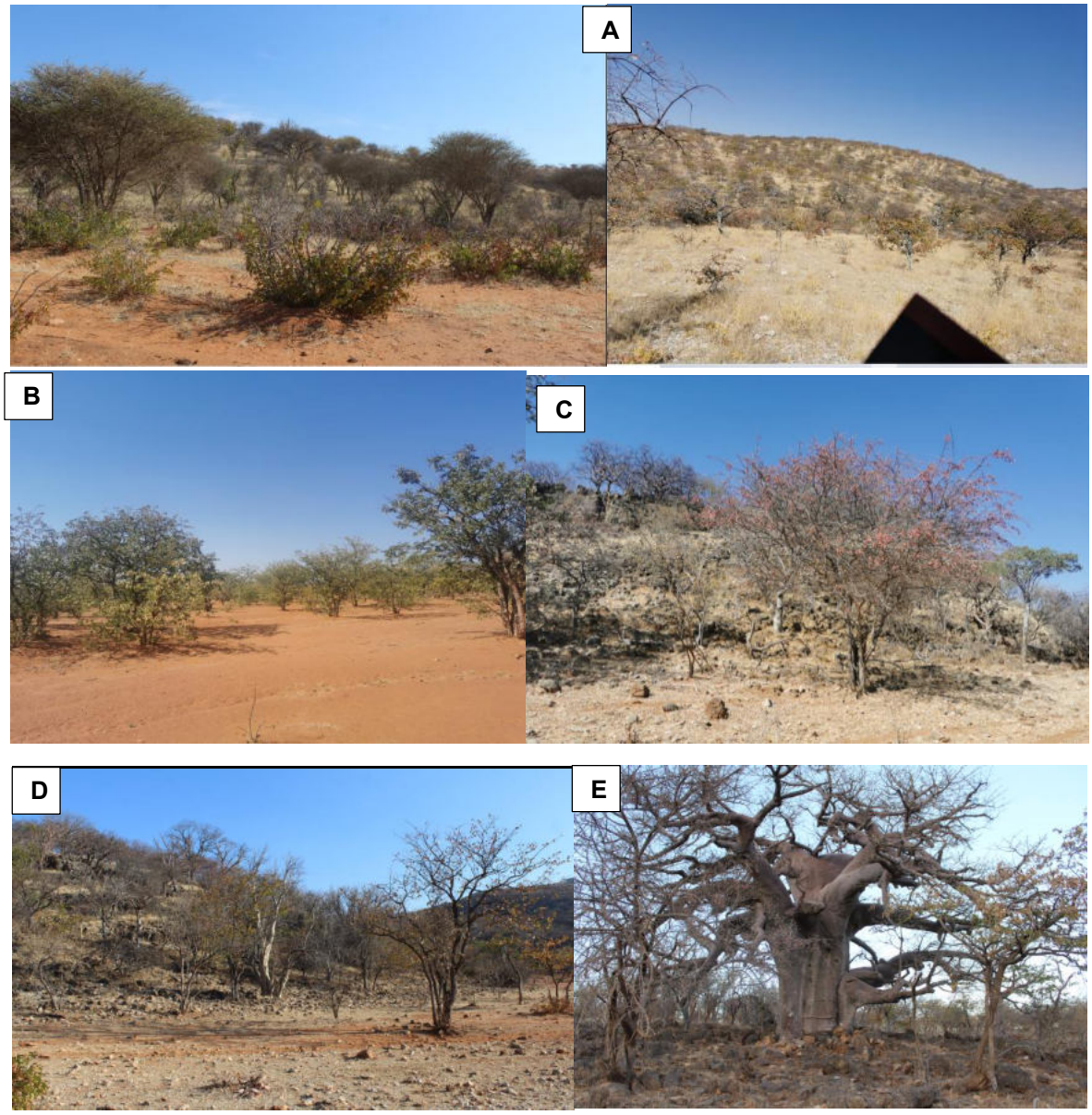

Figure 5-3: Some of the vegetation observed in the EPL area (A – Mopane with camelthorn shrubs in centre of the EPL and towards Ombahe YaKako, B – young Mopane trees, C - Purple-pod terminalia, D – Mopane and Cock-wood species and E - Baobab tree near the C43 within the EPL)

5.2 Physical Environment

5.2.1 Climate

The average rainfall for Kaoko-Otavi area for a full period of thirteen (13) years, i.e., from 2009 to 2022 are shown in Figure 5-4. The Kaoko-Otavi area experiences good rains between December and March, with the highest rainfall recorded in February 2009 (383mm rained for 22 days), followed by 291mm in December 2011 (rained for 12 days) and 287mm in March 2011 (rained for 20 days) – Figure 5-4 (A). The average monthly rainfall recorded is 141mm in February, and 139mm in January - Figure 5-4 (B).

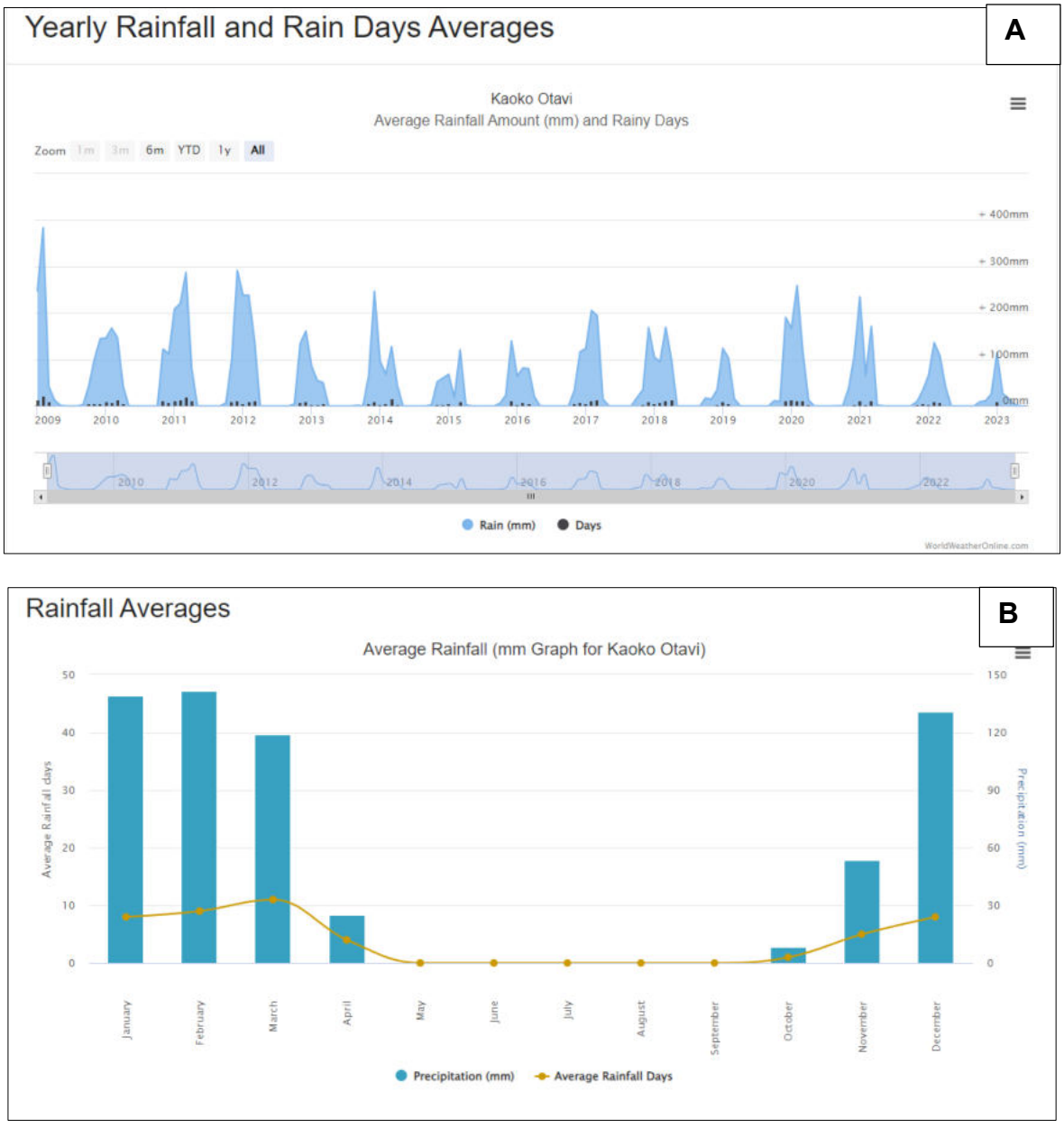

Figure 5-4: The Yearly and average rainfalls for the project area (World Weather Online, 2023)

According to the World Weather Online (2023), the average high temperature for Kaoko-Otavi is 37°C recorded in October 2010 and 2016, and the minimum temperatures are 10 and 12°C around June/July. The average monthly high and low temperatures for the area are 35°C and 12°C, respectively - Figure 5-5.

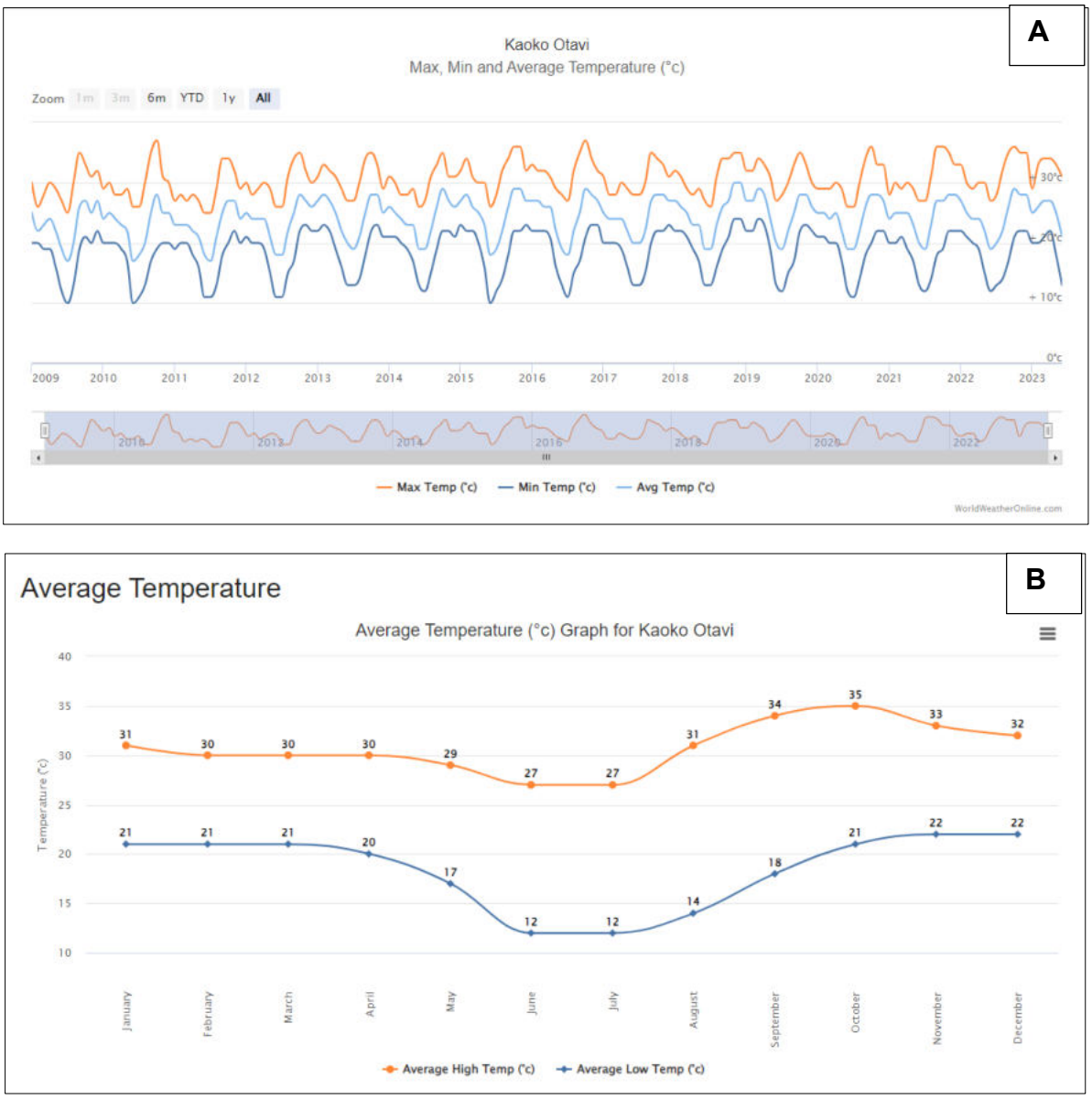

Figure 5-5: Maximum, minimum (A), and average temperatures (B) (World Weather Online, 2023)

5.2.2 Air and Wind

The current air pollution level around Opuwo area and surroundings (including the project area) is good. The air quality index (AQI) is 34 US AQI, and the main pollutant is the atmospheric particulate matter (PM) 2.5 (IQ Air, 2023). PM are microscopic solid or liquid matter suspended in the air with a diameter of 2.5 micrometres (µm) or less. The PM2.5 concentration in the area is 8.1 µg/m³ which is currently 1.6 times the World Health Organization's annual air quality guideline value (IQ Air, 2023) of 5 µg/m³.

In terms of wind, the wind rose for Kaoko-Otavi from the Meteoblue modelled climate is shown in Figure 5-6 and indicates that the wind is dominantly blowing from South-West (SW) to North-East (NE) with the speed between 5 and 19km/h (Meteoblue, 2023). The wind speed chart shows that the wind blows all year round with a speed more than 19km/hour for more than 10 days. These wind speeds are then followed by speeds of less than 12km/hour (blowing between 5 and 10 days) and more than 28km/hour for 5 or less days.

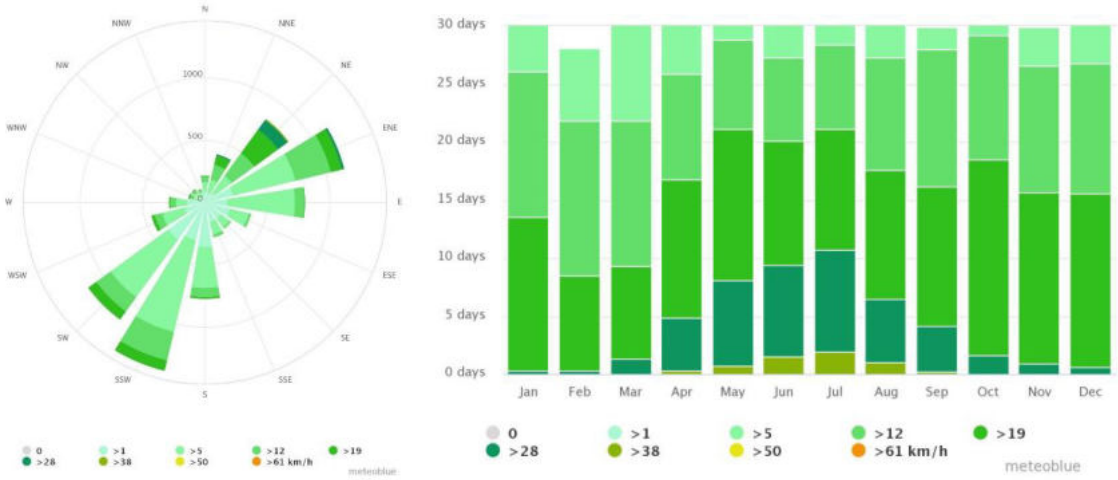

Figure 5-6: The wind rose and chart speed for the EPL area (Meteoblue, 2023)

5.2.3 Landscape and Topography

The EPL is mainly within the Karstveld, which according to Mendelsohn *et al*, (2002) extends as a narrow, raised margin that encircles the lower-lying Owambo Basin in central northern Namibia. The rocks are dominated by limestone that dissolves easily in water, forming large underground caverns, lakes and aquifers. In this landscape, white calcrete rocks litter the surface in lower-lying areas

The EPL falls mainly on hills and mountains with elevations ranging between 1,216 and 2,599 meters above sea level as shown on the topographic map in Figure 5-7 below.

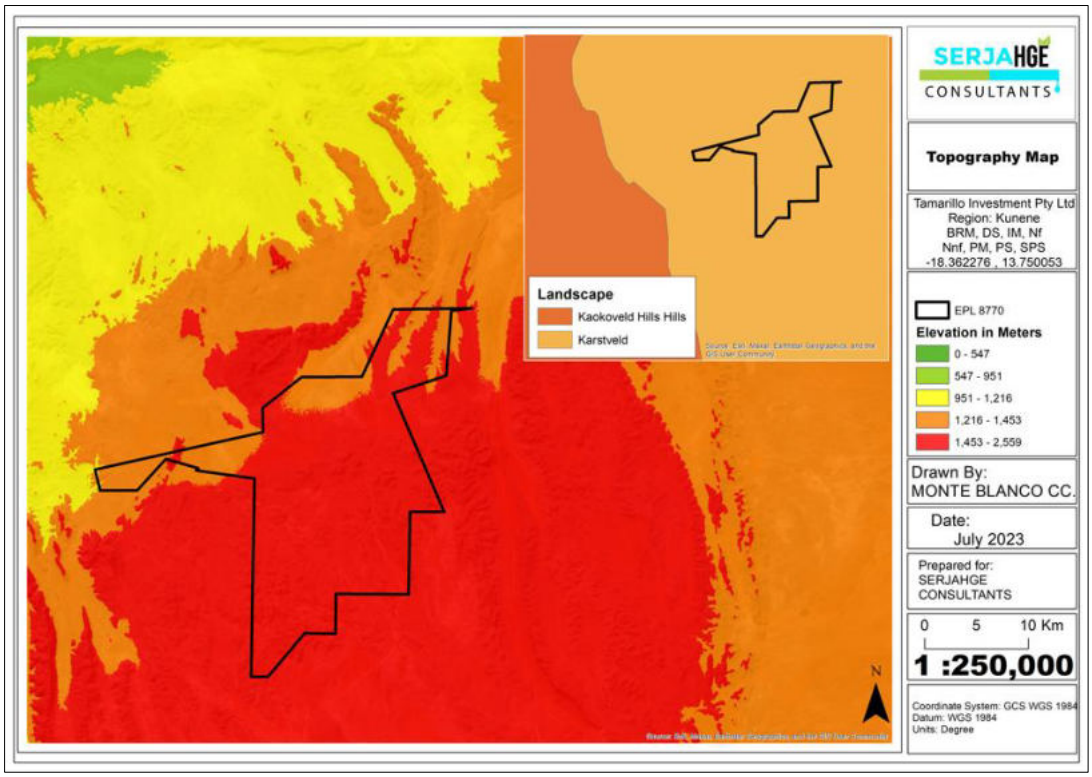

Figure 5-7: The topography and landscape of the EPL area

5.2.4 Geology

The geology of the area is characterized by rocks of the Otavi Group (Mendelsohn et al., 2002). The EPL is overlain by the relatively thin layer of sandy loamy, gravel and calcrete cover of the Kalahari Group. The sediments are underlain by rock units of dolomite, limestone, shale, and quartzite as shown on the geology map in Figure 5-8. The western, central northern and north-eastern parts of the EPL are characterized by the rock units of dolomite, limestone, shale, and chert, with the small protruding outcrop of rock units comprising tillite, boulder shale, shale, sandstone and limestone.

The geological settings of the area (the rock units and their nature to potentially host ores of the sought commodities) triggered the need to prospect and explore within the EPL.

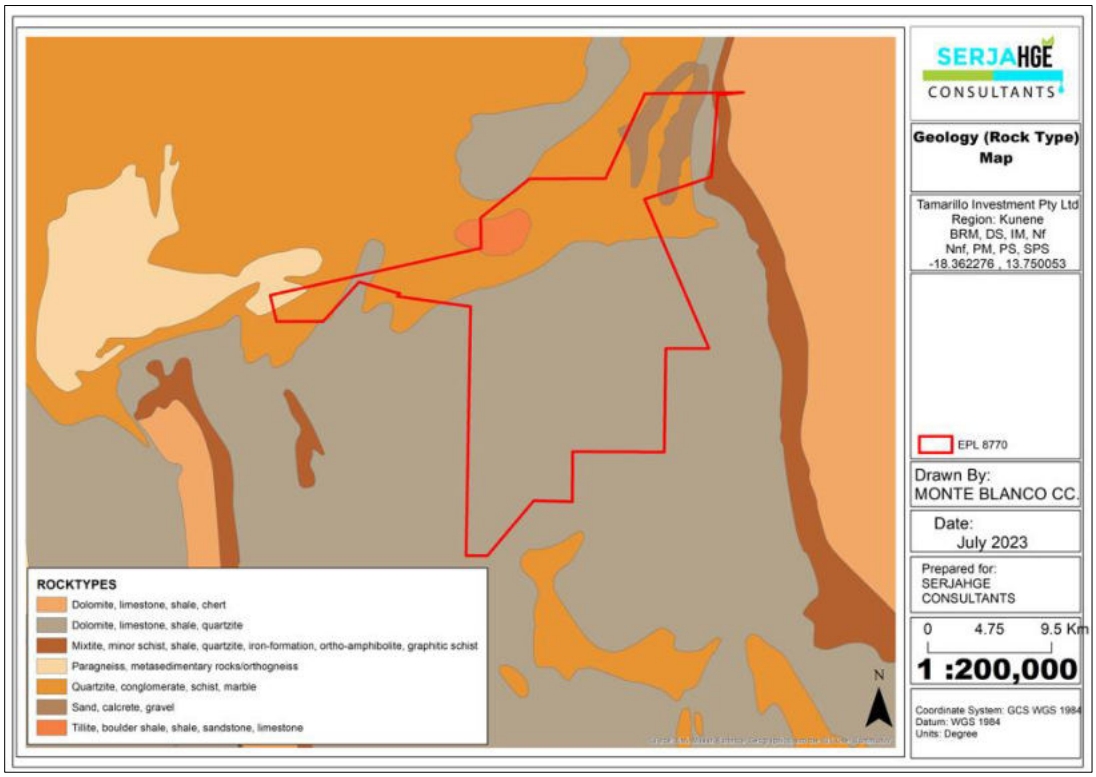

Figure 5-8: The geology of the EPL and surrounding project area

The project site area is characterized by outcrops of visibly weathered dolomite and quartzite as shown in Figure 5-9.

Figure 5-9: Rock units comprising some weathered dolomite, and quartzite observed within the EPL

5.2.5 Site Soils

The EPL is overlain mainly by lithic leptosols and a very small part overlain by eutric regosols as shown on the soil map in Figure 5-10. The lithic are very thin or shallow soils, with their second name component (leptosols) defined as soils that form in actively eroding landscapes, especially in the hilly or undulating areas that cover much of the southern and north-western Namibia (Mendelsohn *et al.*, 2002). These coarse-textured soils (leptosols) are characterized by their limited depth caused by the presence of a continuous hard rock, highly calcareous or cemented layer within 30cm of the surface.

According to Mendelsohn et al, (2002), eutric regosols are medium or fined textured soils of actively eroding landscape, especially in 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 (Mendelsohn *et al*, 2002).

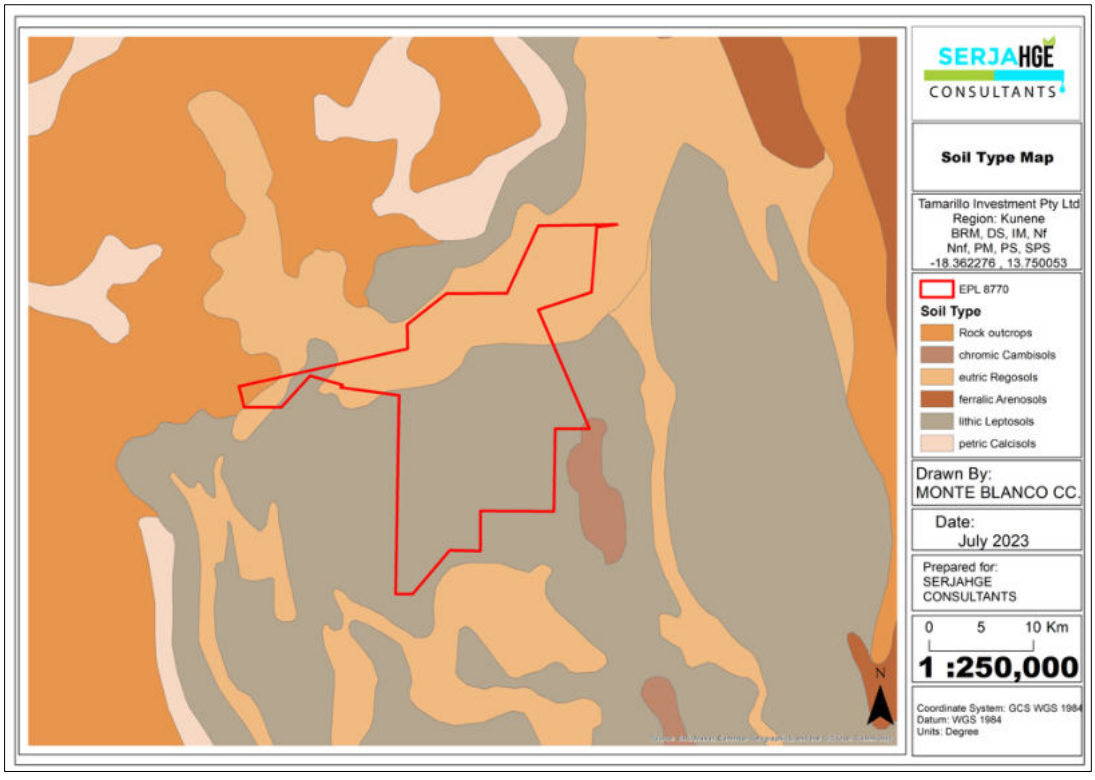

Figure 5-10: The dominant soil types found within the EPL

The typical soils found within the EPL have a reddish, and light brown and sandy and gravely color. The area near Ombaye YaKako comprises thin soil cover overlain by of calcrete and rock outcrops - Figure 5-11.

Figure 5-11: The reddish sandy loamy and rock outcrops observed in the EPL area

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

With regards to groundwater (hydrogeology), the area is found in the Namib and Kaokoveld groundwater basin and of moderate groundwater potential. The moderate potential may be explained by the presence of partially fractured dolomites in the area. In terms of groundwater potential, high yield can be found at areas where dolomites are in contact with other rock types, particularly the non-porous sandstone, conglomerate and quartzites of the Nosib and Mulden Groups, weathering is enhanced by karstification processes (Christelis and Struckmeier, 2011). The EPL is mainly covered by fractured, fissrured or karstified aquifers, far northwestern and northeastern areas underlain by rock bodies with little groundwater potential and the central northern area underlain by porous aquifers (Figure 5-12). Porous aquifers can only only found along major ephemeral rivers in the area as well as contact zones of different rock units. The little groundwater potential in some parts of the EPL and nearby areas could be attributed to the type of rock units underlying these site areas and their non-fractured/faulted nature that limit the storage, transmission, and flow of groundwater.

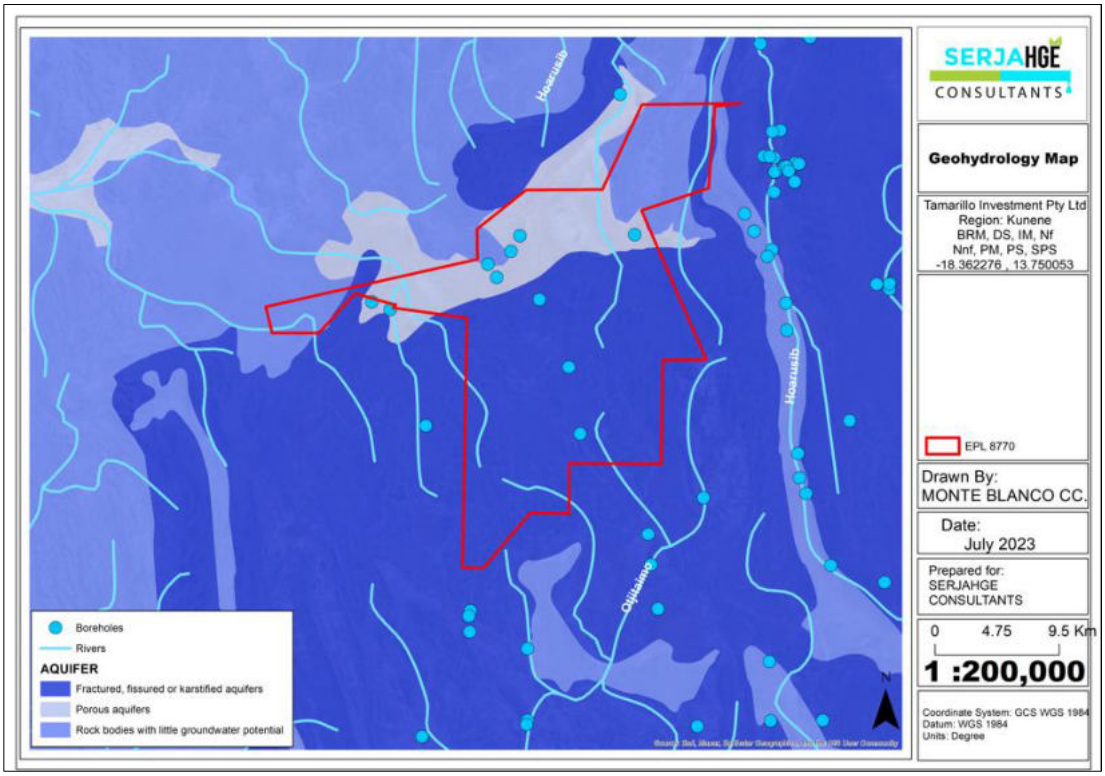

Figure 5-12: The surface and groundwater (geohydrology) map of the EPL area

5.3 Social and Economic Environment

5.3.1 Demography

According to the Namibia Statistics Agency (2014), the Kunene Region has a total population of 86,856 as per the 2011 National Population and Housing Census. Of the total population, 43,253 were females and 43,603 were males. The EPL falls within the Opuwo Rural constituency, which was separated from the single Opuwo Constituency to form Urban and Rural Constituencies. In 2011, the Opuwo Constituency had a population of 27,272 of which 7,657 was urban population (leaving the rural population at 19,615). Of the 27,272 population of the Constituency, 13,896 were females and 13,376 were male. The constituency has a literacy of 62%, with 42% having left school, 11% at school and 43% never attended school by 2011. Approximately 63% of the inhabitants in the constituency are economically active of which 59% are formally employed and 41% unemployed (Namibia Statistics Agency, 2014).

5.3.2 Economic Activities

The main sources of income of the Opuwo Constituency as per the Namibia Statistics Agency (2014) were farming (47%), wages & salaries (27%), cash remittance (3%), business, non-farming (12%) and pension (10%).

5.3.2.1 Agriculture and Farming

Livestock production is one of the key sources of livelihood to many rural households of the Kunene Region (Kunene Regional Council, 2015). The trading of animals during formal auctions especially in Outjo, Kamanjab, Khorixas and informal sales in Opuwo, creates a source of income for farmers (residents) residing in these constituencies. The exportation of animals from Kunene Region to neighboring countries continues to boost the economy of the Region. In support of the industry, the Government established five Quarantine camps to improve the quality and health of animals marketed namely, at Swartbooi Drift, Ehomba, Khowarib, Condor, Palmwag, Otjakati and Omutambo-omawe, which is situated in Omusati Region but under the jurisdiction of Opuwo state veterinary office (Kunene Regional Council, 2015).

From a local perspective, the communal farms keep livestock such as cattle, sheep, goats, donkeys as well as horses that are grazed on the open land in the area.

5.3.2.2 Exploration and Mining

Kunene Region offers great opportunities for mineral exploration due to its rock and mountainous formations, which are pivotal for regional economic growth and development. Exploration and discovery of mineral resources is at an advanced stage and if found economically viable, could contribute significantly to the economic growth of the Region (Kunene Regional Council, 2015).

According to the Namibia Chamber of Mines' 2013 annual review, the Koako Base Metals Project have discovered Okanihova Copper targets and confirmed that there is a body of Iron-Ore at Otuziru (e.g., Lead, Zinc and Silver deposits). In addition, Teck Namibia Limited have also been exploring for Copper in the Kunene Region (Kunene Regional Council, 2015). Apart from some exploration licenses in the Region, there are several small-scale miners who own and operate mining claims in the area and winder area of the Kunene Region. Through the mining claims, the communities generate minimal income through mined element (i.e., Copper, Zinc, Iron, etc.) sales.

Other registered mineral licenses (EPLs, and mining claims) around EPL-8770, whereby exploration works may or may not be undertaken currently are shown on the map in Figure 5-13.

As it is with most EPLs, there are two application for two mining claims (small-scale miners) within the EPL boundaries (MC-73901 (Kondanda Marvin Herunga) on the eastern middle part of the EPL, as well as MC-72530 (application for Karimunika Wendy Matundu)) and partly touched active mining claim (MC-71343 for Alfa Ngunatjo Koviti) to the upper western wig of the EPL.

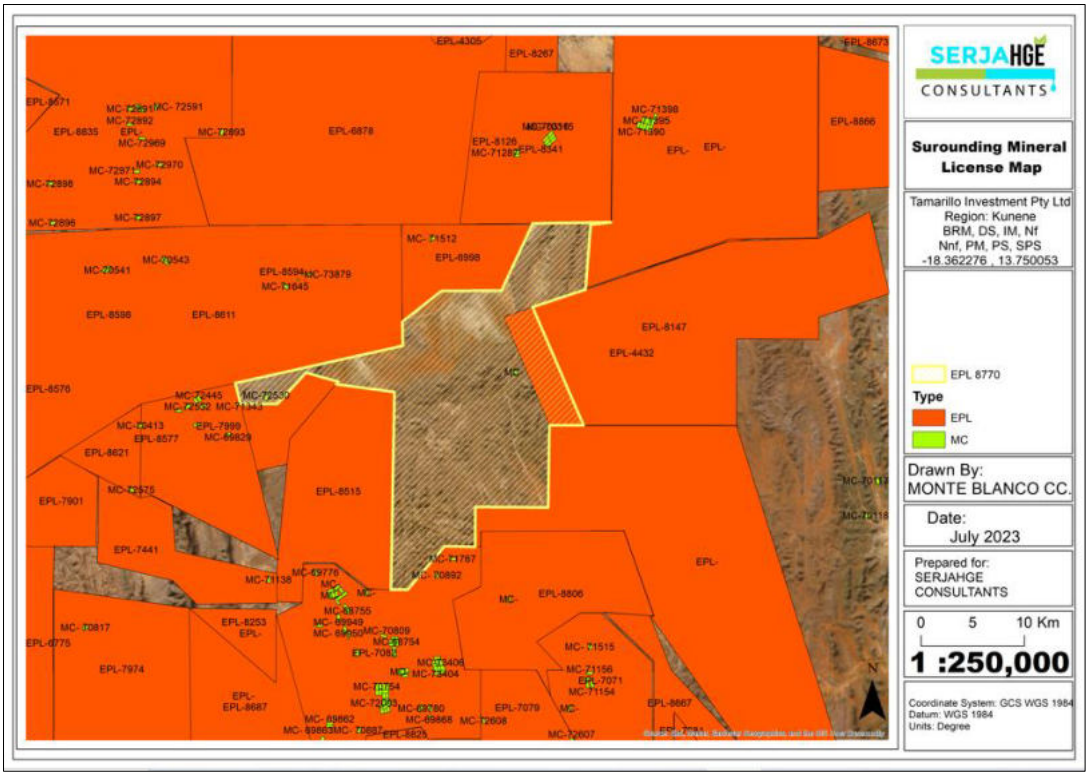

Figure 5-13: The mineral licenses around EPL-8770

5.3.2.3 Tourism

The Kunene Region is classified as a prime tourist destination due to its rugged landscapes and ancient traditional diversity and practices. Tourism has been identified as a key economic sector for the region, predominated by wild animals in national parks and conservancies. The potential for further tourism development is very high due to its scenic beauty, wildlife, and the culture of its inhabitants (Kunene Regional Council, 2015).

Eco-tourism in joint operations with community-based natural resource management is likely to be one of the region's major economic drivers. This is due to the continuous increase in the region's wildlife numbers, which has led to the region becoming a major eco-tourism destination. The creation of conservancies has boosted direct economic benefit to the communities' region-wide, to the communal areas of Kunene Region. According to the Kunene Regional Council (2015), there are currently 37 registered communal conservancies in the Kunene Region, representing 46% of the total registered conservancies in the country of 79.

5.3.3 Infrastructure and Services

The Kunene Region has some grave and tarred roads. According to the Kunene Regional Council (2015), Kunene Region has coverage of 545km of tarred road connecting all major towns such as Outjo, Khorixas, Kamanjab and Opuwo. However, some areas in the Region are not accessible due to poor road

infrastructure and the lack of bridges along river channels contributes to transport challenges during rainy seasons. The landscape of the region is mountainous making it difficult to reach communities living in up-hill and valley areas.

The summary of current services infrastructure in and around the EPL area include:

- Road network: The EPL is accessed from the C43, D3705 and 3707 via the local single-track roads.
- Electricity supply and water supply: The communities have electricity and some use solar energy for power supply. The community boreholes supply water to the community and according to the communities the water is sufficient for their domestic needs. There are some existing boreholes in the project area.
- Telecommunication services: The area has good network coverage. The main providers of this service in the area are Telecom Namibia and MTC Namibia.

5.4 EPL Area and Surrounding Land Uses

The EPL area falls is communal and mainly comprising of small settlements, villages and open land used for livestock grazing. Further to the south (about 20km) and southeast (about 30km) of the EPL boundary are communal conservancies such as Otjambangu (southwest of Omao Village), Okangundumba (stretching south-southeast-east of Omao covering villages such as Ombombo, Omunuandjai and Okaaru), and Ozondundu. The land use map with depicted parts of the conservancies near the EPL (or on the EPL side) is shown on the map in Figure 5-14 below.

These communal conservancies (outside and far from the EPL boundaries) are home to wild animals such as occasionally elephant, leopard, mountain zebra, kudu, gemsbok, springbok, steenbok, klipspringer, ostrich, cheetah, spotted hyena, black-backed jackal, baboon, giraffe, kudu, duiker, and black-faced impala (NACSO, 2023).

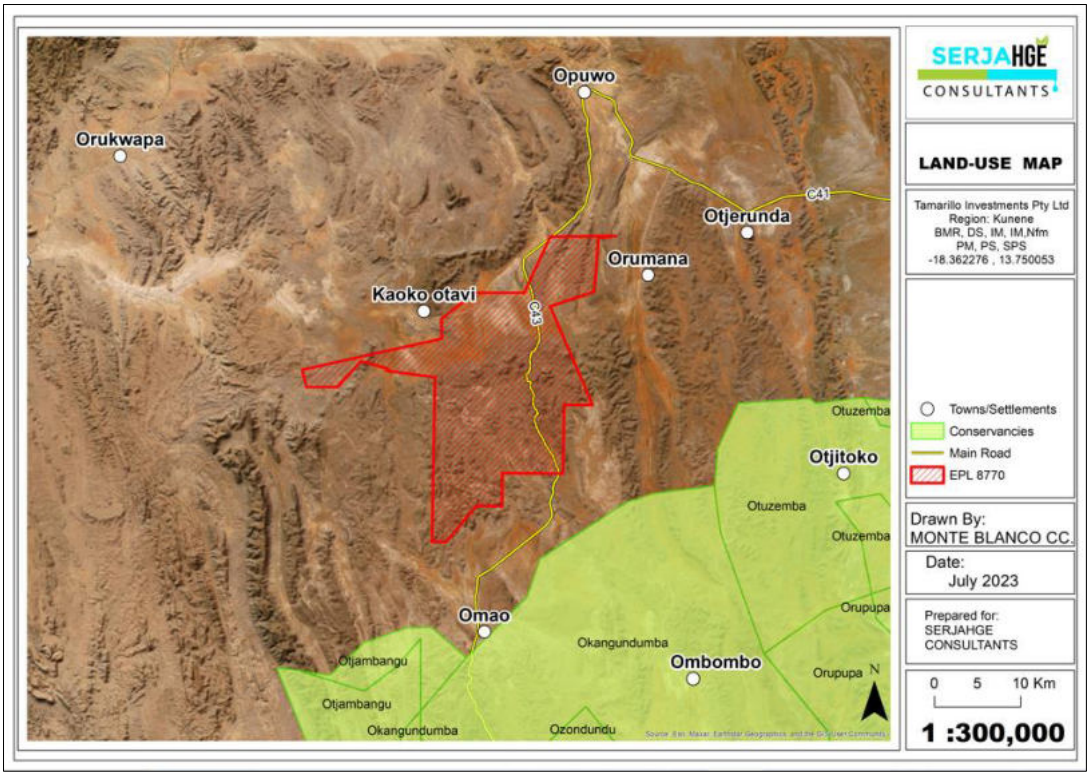

Figure 5-14: The land uses on and around the EPL

5.5 Archaeology and Heritage Aspect

An Archaeological & Heritage Impact Assessment (AHIA) was carried out for the EPL by a qualified and experienced Archaeologist from TARO Archaeology Consultants. The site assessment was conducted and a baseline assessment compiled thereto and contained herein under this section. At a later stage, the AHIA Report will be submitted to the National Heritage Council (NHC) for evaluation and consideration of the Heritage Consent for EPL-8770. Archaeological management and precautionary measures will be implemented onsite to ensure continued protection of the resources during the prospecting and exploration activities on the EPL.

5.5.1 Regional Context

The Kunene Region hosts about seven (7) declared heritage sites and other archaeological records, it is based on this background that the EPL area is likely to have important archaeological sites. According to Kinahan (2013) HIA Report, the Kunene Region is not well explored archaeologically. Early investigations by MacCalman (1972) and MacCalman and Grobbelaar (1965) drew attention to the presence of late Pleistocene evidence from the area, and more spectacularly, observations on stone tool use by contemporary hunter-gatherer groups. More recent investigations have documented a late Holocene occupation sequence (Albrecht et al 2001) and some of the detailed archaeological characteristics of nomadic pastoral settlement patterns in the area (Kinahan 2001). Limited information is available from the adjacent parts of southern Angola (Ervedosa 1980). Some is evidence from this part of Kunene Region for human occupation over at least the last one million years. The earliest evidence, dating from the mid-Pleistocene, is primarily in the form of crude stone implements found as surface scatters in the vicinity of major drainage lines. Later Pleistocene remains include well fashioned bifacial stone hand-axes which in the last 200 000 years were superseded by a complex toolkit of smaller artefacts that could be attached to wooden spear shafts and scraper tool handles.

According to Deacon and Lancaster (1988) the late Pleistocene culminating in the Last Glacial Maximum brought important environmental changes to this region, including the establishment of the mid-Kunene drainage as it exists today. Hydrological changes in major drainage basins had fundamental effects on the viability of human settlement, such that while the region immediately to the south was abandoned under conditions of extreme aridity, the northern Kunene Region sustained almost continuous occupation over the last 12 000 years. The archaeological record of human occupation in the early to mid-Holocene shows an emphasis on rock shelter sites along the escarpment, used as hunting camps.

According to the National Heritage Council of Namibia, Kunene Region has about 7 known heritage sites which are listed as national monuments (Declared Sites/Lists of National Heritage). Table 5-1 shows the declared heritage sites in Kunene Region in Namibia. However, these declared heritage sites are occurring far from the proposed project.

Table 5-1: Declared Heritage Sites in Kunene Region (TARO Consultants, 2023)

Designation	Description	Built/Construction Period	Location	Monument number
Rock Engravings at Peet Alberts Koppie	Rock engravings		Kamanjab Karte	036/1967
Naulila-Denkmal	Monument	1933	Outjo Karte	052/1971
Stone Tower	Wasserturm	1900	Outjo Karte	027/1975
Dorsland Tractor Cottage	Historic building	1878		009/1951
Petrified Forest	Petrified Wood	250 million years	Khorixas	004/1950
Twyfelfontein	Cave, rock carvings	about 4000 BC Chr	Khorixas	016/1952
Burnt Mountain	Rock Formation	80 million years	Khorixas	024/1956

5.5.2 Local Perspective and Findings

There are certain old and historical graves observed within EPL-8770 boundaries especially along Oruhito Village (at 18°20'50.5"S 13°43'14.6"E), Ombahe Village (18°24'14.1"S 13°43'17.13"E) and community burial place near Kaoko-Otavi (where people mostly live) – Figure 5-15. Therefore, it is recommended that the National Heritage Act, No. 27 of 2004 should be strictly enforced, and concurrently the recommendation given in the statutory documents for this project should be strictly adhered to. If a heritage site or items of heritage significance are found in the course of the prospecting and exploration activities, then a chance finds procedure should be followed as per the National Heritage Act, No. 27 of 2004. There are two recorded archaeological sites as per the available National Heritage Council (NHC) database located western (about 20km away) and northeast (about 10km) of the EPL as shown in Figure 5-15 (two green dots).

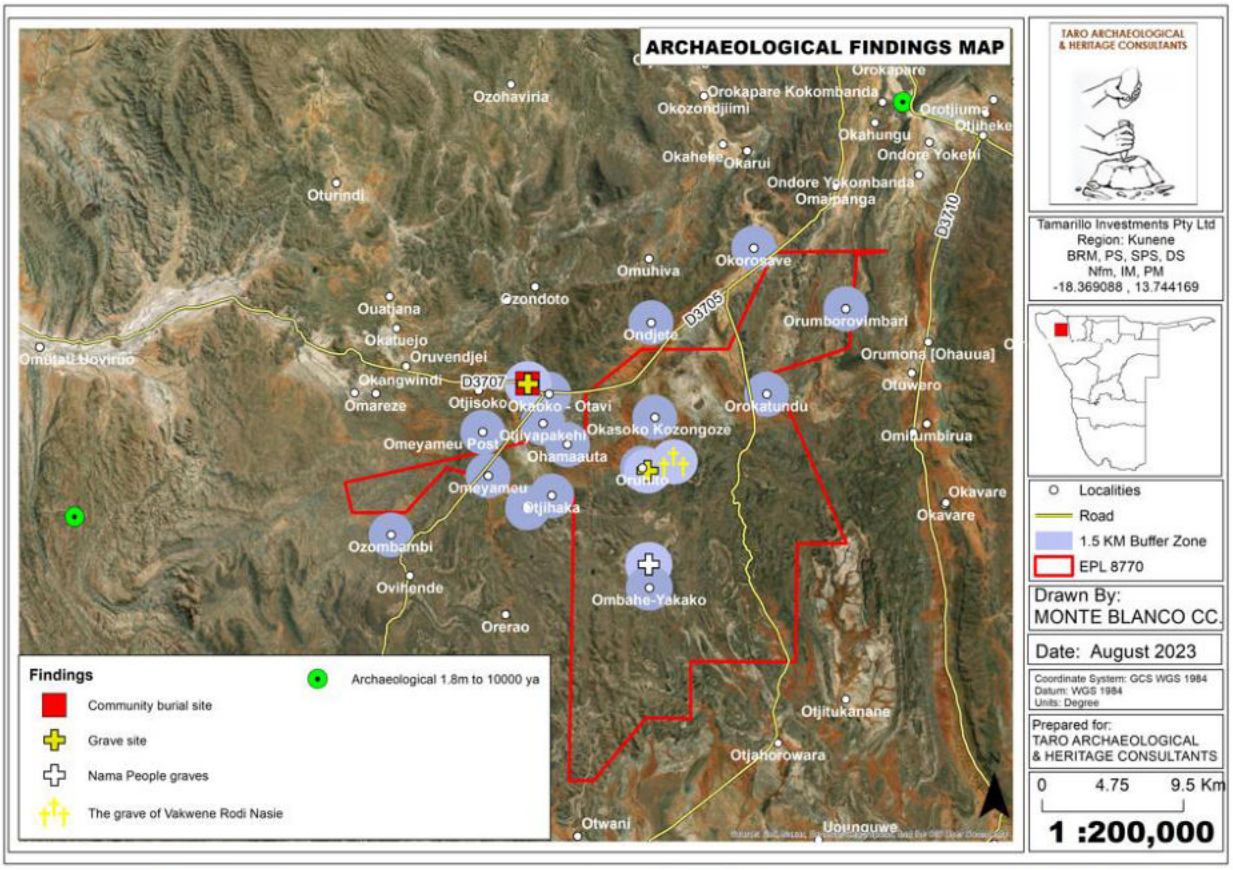

Figure 5-15: Archaeological findings map from the traversed areas within the EPL and heritage sites recorded by the NHC (TARO Consultants, 2023)

The public consultation and engagement process and means employed for the EPL ESA Study 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. The consultation for this project has been done under the EMA and its EIA Regulations and as per the following subsections.

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, while other parties who contacted the Consultant after project advertisement notices in the newspapers, were registered as I&APs upon their request.

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 development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing brief information about the proposed project was compiled and hand delivered to the Ministry of Environment, Forestry and Tourism (MEFT) accompanying the ECC application, and uploaded on the MEFT (ECC) Portal for project registration and shared with registered Interested and Affected parties (I&APs).
- A Stakeholders' (I&AP) List was developed and updated as new I&APs register for the ESA.
- Project Environmental Assessment notices were published in the *New Era* and *Windhoek Observer* newspapers on the 14th and 19th of July 2023 – Appendix C. The consultation period ran from the 14th of July 2023 to the 11th of August 2023.
- A consultation meeting was scheduled and held with the local Traditional Authority and public on the 05th of August 2023 (in Kaoko-Otavi) as shown in the photos in Figure 6-1. The meeting was attended by ninety-six (96) people as per the attendance register (people kept joining the proceedings throughout the day). The consultation meeting minutes were taken and are attached hereto as Appendix D.

The meeting minutes were circulated to the stakeholders and I&APs for review and comments thereto from the 11th to the 18th of August 2023. However, no comments were received on the minutes.

Figure 6-1: Consultation meeting with the community in Kaoko-Otavi on 05 August 2023

- A3 size posters were pasted at the Kunene Regional Council Head Office (in Opuwo) - Figure 6-2 and in Kaoko-Otavi Settlement (at the local convenience market) – Figure 6-3.

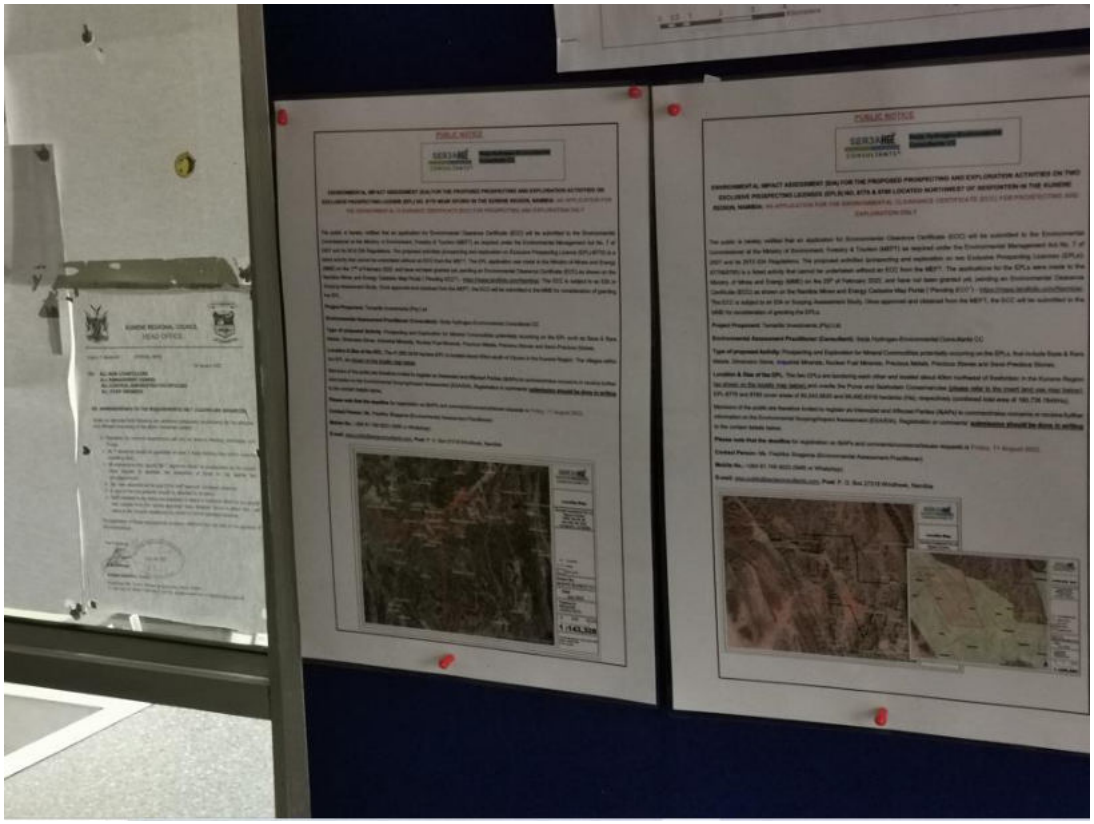

Figure 6-2: The A3 ESA Study Poster at the Kunene Regional Council Office notice board in Opuwo

Figure 6-3: The A3 ESA Study Poster pasted at Kaoko-Otavi Store in Kaoko-Otavi

6.3 Feedback and Issues raised by the Stakeholders (I&APs)

Issues were raised by I&APs (from the consultation meetings) and these issues have been recorded and incorporated in the ESA Report and EMP. The summary these few key issues are presented in Table 6-1.

Table 6-1: Summary of main issues and comments received throughout the consultation period (consultation meeting)

Aspect	Summary of impact or concern
Comments and Issues received or noted during the consultation meetings	
Community benefits through employment (unskilled and semi-skilled labour) during exploration and further corporate social responsibility (CSR) where possible	-Sourcing of semi-skilled and unskilled labour from the community for workers like rivers, translators, Health Safety & Environment Officer(s), Geotechnicians, cooks, etc.
Transparency and clear communication	-There should be transparency and constant communication between Tamarillo Investments, Consultant and Traditional Authority (community) to update on the project progress.
The conflicts between small-scale miners (mining claims owners) and EPL holders	-some EPL holders do not want small-scale miners mining inside their EPLs, and this is an issue around Otuani
Archaeological and heritage resources	-There are Nama graves that believed to be over 100 years old at Ombahe-Yakako. Therefore, should be protected.
Utilization of available local goods and services	Consider the use of local procurement of services and goods for the project activities to empower local businesses, where possible and applicable.

The consultation period ran from the 14th of July 2023 to the 04th of August 2023, however, it was extended to the 18th of August 2023 to allow comments after the consultation meetings. Comments were submitted to Serja Consultant during consultation meetings as summarized above indicated in the meeting minutes, and summarized above.

6.4 Feedback on the Draft Scoping Assessment Report Review

For review and further comments, the Draft ESA (Scoping) Report, Environmental Management Plan (EMP) as well as the associated appendices were circulated to the I&APs on the 28th of August 2023 for a period of seven day, i.e., until the 04th of September 2023. There were no comments received during this period.

The next chapter is the presentation of potential impacts identified, the assessment methodology, impact description and their 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 (although temporary):

- Local socio-economic development through temporary employment creation,
- Payment of land use fees to the Traditional Authority, and if necessary, the payment of rental fees for setting up structures such as campsites in the area to assist in uplifting the local communities.
- Where possible, exploration holes that have good water strike would be donated to the community, after completion of exploration works in such holes.

- Procurement of local goods and services for exploration by small and medium businesses to promote local entrepreneurship empowerment and local economic development.

Potential negative (adverse) impacts:

- Physical land / soil disturbance resulting in compaction and erosion,
- Disturbance to grazing land for animals
- Impact on local biodiversity (fauna and flora) and habitat disturbance,
- Potential conflicts between the Proponent and small-scale miners who applied for or have Mining Claims (MCs) within the EPL boundaries. These three MCs are MC-73901 (Kondanda Marvin Herunga), MC-72530 (Karimunika Wendy Matundu), and partly touched active MC-71343 for Alfa Ngunatjo Koviti)
- The potential impact of illegal hunting/poaching of wildlife in the area,
- Potential impact on water resources and soils (over-abstraction and pollution),
- Air quality (compromise the surrounding air quality),
- Visual impact from unrehabilitated explored/disturbed areas on the EPL (as result of trenching and drilling activities and dimension stone exploration) may be an eyesore to travellers (including tourists) on the local roads,
- Potential occupational health and safety risks and to the communities (open and unattended trenches and drilled holes may pose a risk to people and animals (both livestock and wildlife)),
- Noise associated with exploration drilling and movement of heavy trucks to site,
- Vehicular traffic safety & impact on local roads,
- Environmental pollution (littering), and
- Impact on Archaeological and cultural heritage resources.

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)**
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				

The Criteria used to assess the potential negative impacts				
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 in the 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 use fees for socio-economic development	Payment of land use fees to the Traditional Authority will assist in uplifting the communities within the EPL boundaries and immediate surroundings.	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 for exploration by small and medium businesses 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
Negative (Adverse) Impacts											
Physical disturbance	The excavations and land clearing to enable siting of project structures and equipment will potentially result in soil	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
to the site soils	disturbance through target site establishment, access road creations and unnecessary offload driving. These would leave the site soils exposed to erosion (areas with no to little vegetation cover to the soils in place). 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.										
Impact on the sensitive 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 to 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	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
	wildlife at the explored sites of the EPL. There is also a 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. Flora: The already scarce flora (vegetation) in the area would be impacted through land clearing to create exploration access roads, setting up project equipment and infrastructures, and detailed exploration activities such as trenching and drilling. 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.										
Conflict between the Proponent and Mining Claims	The fact that there are existing application for mining claims rights by some locals/small-scale miners within the Tamarillo Investments (Proponent)'s EPL	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
owners (small-scale miners) over commodities exploration and mining (for MCs) in the area	may lead to conflicts between the small-scale miners and Proponent. Potential conflicts between the Proponent and small-scale miners who applied for or have Mining Claims (MCs) within the EPL boundaries, at times whereby the two applicants applied for the same commodity/ies. Since, the EPL activities are focused on prospecting and exploration only, the Proponent will focus on that and within their boundaries right, but excluding the Mining Claims. The MCs owners, if approved by MME would have the rights to mine within their MC boundaries only and not outside. Therefore, this is a matter of educating the small-scale miners (MC owners) about their rights to mine in an area, even if it is inside an EPL. Some (new) EPL owners may not be aware of this but they equally need to be educated about this and respect the rights of MC owners. If no measure is										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	in place to mitigate this, the significance will be medium to high, but upon implementing the measures, the significance will be reduced to low.										
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, exploration activities such as trenching or drilling would also contribute to the dust levels in the air. The impact is considered short-term and localized as exploration activities are carried over a specified durations at selected sites only. Therefore, manageable with mitigation measures.	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
Visual impact: Scenic view of the area for Tourism	Exploration activities, particularly for Dimension Stone of white marbles or granites usually leave scars on the local landscape. This is bound to happen when exploration sites are located close to or along roads, and	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
	these scars in many cases contrasts the surrounding landscape and thus may potentially become a visual nuisance, especially in tourist-prone areas such as the areas of the EPLs. The sight of the explored and unrehabilitated areas of the EPL may be an eyesore to tourists and other road users. The eyesore associated with Dimension Stone is mainly associated with white marble or granite exploration and or mining, given their distinctive color from the host environment compared to dark or black granites and dolerites. The presence of exploration vehicles and machinery may impact the scenic view of the area for tourism and travelers on the roads. This impact is considered minimal as only small blocks of the stone will be extracted for analysis as part of exploration and duration will be short.										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
Water Resources Demand and Use	The abstraction of more water than it can be replenished from low groundwater potential areas would negatively affect people and animals in the area who rely on the same low potential groundwater resource (aquifer). The impact of the project activities on the resources would be dependent on the water volumes required by each project activity. Commonly exploration activities use a lot of water, mainly diamond drilling (for Base & Rare, Industrial Minerals, Nuclear Fuels and Precious Metals) that is more water-consuming compared to other techniques like reverse circulation. The amount of water required for diamond drilling would be 10,000 to 25,000 litres (10 to 25 m^3) per day per hole. 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	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
	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, if not handled properly. The anticipated potential source of pollution to water resources from the project activities would be hydrocarbons (oil) from project vehicles, machinery, and equipment and potential wastewater/effluent from exploration related activities. The spills (depending on volumes spilled on the soils)	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
	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 (Environmental pollution)	Waste types such as solid, wastewater and possibly hazardous will be produced onsite during exploration. If the 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 wild	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
	animals 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 will 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										
Occupational and Community Health and Safety Risks	Project personnel (workers) involved in the exploration activities may be exposed to health and safety risks. The heavy vehicle, equipment and fuel storage area will be properly secured to prevent any harm or injury to the Proponent's personnel, locals and animals. Another potential risks to both people and wildlife within the	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
	EPL are unfenced exploration trenches or trenches that are not backfilled after completing the sampling. Unsecured exploration trenches and even uncapped holes could pose a risk of people, livestock and or wildlife 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 safety risk to the project personnel and locals too.										
Vehicular Traffic Safety	The local roads such as C43 and local access roads are the main transportation routes for all vehicular movement in the EPL area. 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, goods and services to site. Depending on the project needs, trucks, medium and small vehicles will be frequenting the	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
	area to and from exploration sites on the EPL. This would potentially increase slow moving heavy vehicular traffic along these roads. There is a potential risk of road accidents during rainy seasons when the road connections in the Kunene, particularly the Opuwo-Sesfontein road (C43) is normally in very bad conditions for traffic movement. Therefore, if exploration vehicles travel to site between November / December and March, this might impact vehicular traffic and safety. 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.										
Impact on local road use	The project activities will mean an increased movement of heavy trucks and equipment on the local gravel roads which would exert more pressure on these roads, and worsening their	M: -3	M: -3	M / L: -4	M / H: 4	M: -40	L - 1	L - 1	M / L - 4	M / L -2	L - 12

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	conditions. This will be a concern if maintenance and care is not done during the exploration phase. The heavy truck will only be expected in the area (rarely two trucks) during the trenching and drilling stage. The impact would be short-term and therefore, manageable. The impact would be short-term and therefore, manageable.										
Noise and vibration from drilling	There is a potential of noise from certain activities (drilling and trenching), which may be a nuisance to communities and wildlife in the area. Excessive noise and vibrations without any protective measures in place can be also 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 with a 1.5km buffer from settlements, thus, the impact likelihood is minimal.	M - 3	M - 3	M - 6	M / H - 4	M – 48	L - 1	L / M - 2	L - 2	L / M -2	L - 10
Archaeological and	The proposed project activities are likely to involve the removal of topsoil for prospecting and	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
Heritage resources	excavation phase. The most impact is likely to be caused by earthworks in the form of clearing, drilling, excavating, removing, or micro-sitting of the project equipment. The area is known to have sensitive archaeological and heritage sites. According to TARO Consultants (2023), the proposed prospecting and exploration area contain some cultural and heritage significance within the social context. Therefore, some areas within the boundaries of the proposed project site area are highly sensitive and culturally significant such as old and historical graves (marked and unmarked), new graves, artefacts that characterize the need for mitigation measures to safeguard and protect any other existing archaeological cultural materials in the areas. These should be protected either by fencing them off or demarcation for preservation purposes i.e., no exploration activities should be										

Impact	Impact Description	Impact Assessment									
		Pre-mitigation Rating					Post-mitigation Rating				
		Extent	Duration	Intensity	Probability	Significance	Extent	Duration	Intensity	Probability	Significance
	conducted near these recorded areas through the establishment of 500m to 1km buffer zones. Therefore, this impact can be rated as medium significance, if there are no mitigation measures in place. However, upon implementation of the measures, the impact significance will be reduced to a lower rating.										

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): During the ESA consultation process, it was indicated that poaching has been ongoing in the area, and some of which could be linked to people from outside the area. Therefore, this impact is likely to continue with the introduced additional people (related to projects) in the area. Regardless, mitigations measures EMP (accompanied by monitoring) will need to be implemented to mitigate this impact.
- Impact on road infrastructure: The proposed exploration activities will contribute cumulatively to various existing activities such as travelling associated with tourism, and 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.
- Impact on Archaeological and Heritage resources: according to Mushi (2023), some archaeological materials such as stone artefacts and sites are likely to be lost during the clearance of land or construction of other facilities necessary for exploration works. Similarly, the focus of mitigation measures for archaeological and cultural heritage is to recommend the layout of the project to avoid all known significant heritage or cultural sites and burial places and will thus make a negligible contribution to cumulative impacts. The cumulative impacts are deemed to be of low significance in this case. However, with the implementation of project-specific mitigation measures as listed in the Draft EMP, this would reduce the impact significance from lot to very low after mitigation, and eventually negligible.

The recommendations and conclusion made for the environmental assessment on the EPL are presented under the next chapter.

8 RECOMMENDATIONS AND CONCLUSIONS

The ESA Study for the proposed exploration activities on EPL-8770 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 notified as required by Section 21 to 24 of the EIA Regulations by placing adverts in three newspapers (*New Era* and *Windhoek Observer*) on 14 and 19 July 2023. The consultation period ran from 14 July 2023 to 11 August 2023. Consultation meetings were held and comments to the proposed project activities.

Some key potential positive and negative impacts were identified by the Environmental Consultant and based on issues raised by I&APs during the consultation period. The issues raised by the I&APs were addressed and incorporated into this Report whereby mitigation measures have been provided thereof in a form of action measures provide in the Draft EMP) to avoid and/or minimize their significance on the environmental and social components.

Impact Assessment: The key negative impacts were described, assessed. The potential negative impacts indicated a medium rating significance. To minimize the significance, appropriate management and mitigation measures made thereof for implementation by the Proponent, their contractors, and workers to avoid and/or minimize their significance on the environmental and social components. The effective implementation of the recommended management and mitigation measures accompanied by monitoring will particularly see the reduction in the significance of adverse impacts that cannot be avoided completely (from medium rating to low).

The Scoping assessment (ESA) Study was deemed sufficient and concluded that no further detailed assessments are required to the ECC application for the prospecting and exploration activities.

Serja Consultants are confident that the potential negative impacts associated with the proposed project activities can be managed and mitigated by the effective implementation of the recommended management and mitigation measures and with more effort and commitment put on monitoring the implementation of these measures.

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.
- All required permits, licenses and approvals for the proposed activities should be obtained as required. These include permits and licenses for land use agreements, services provision

agreements (water provision) to explore and ensuring compliance with these specific legal requirements.

- Transparency in communication and continued engagement with the communities and or through their leaders (traditional authorities) should be maintained before and throughout the project.
- The Proponent, their project workers or contractors comply with the legal requirements governing their project and its associated activities and ensure that project permits and or approvals required to undertake specific site activities are obtained and renewed as stipulated by the issuing authorities.
- Site areas where exploration activities have ceased are rehabilitated, as far as practicable, to their pre-exploration state. This includes the levelling of stockpiled topsoil, backfilling of exploration trenches and closing/capping of exploration holes.
- The EMP implementation onsite should be checked and done by the responsible team member onsite (Environmental Control Officer), and audited by an Independent Environmental Consultant on a bi-Annual basis to compile Environmental Monitoring (Audit) Reports. These reports are to be submitted to the Environmental Commissioner at the DEAF – This will be required by the Environmental Commissioner (as part of the ECC conditions).

In conclusion, 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.

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