APP-004984
EXPLORATION ACTIVITIES ON EXCLUSIVE PROSPECTING LICENSE (EPL) AREA 8049 IN THE KHOMAS REGION

ENVIRONMENTAL ASSESSMENT SCOPING REPORT

Assessed by:

Assessed for:

November 2024

Project:	**EXPLORATION ACTIVITIES ON EXCLUSIVE PROSPECTING LICENSE (EPL) AREA 8049 IN THE KHOMAS REGION: ENVIRONMENTAL ASSESSMENT SCOPING REPORT**	
Report Version/Date:	Final November 2024	
APP No:	241120004984	
Prepared for:	Votorantim Metals Namibia (Pty) Ltd P O Box 97957 Maerua Park Windhoek Namibia	
Lead Consultant:	Geo Pollution Technologies (Pty) Ltd PO Box 11073 Windhoek Namibia	TEL.: (+264-61) 257411 FAX.: (+264) 88626368
Main Project Team:	**André Faul** **(**B.Sc. Zoology/Biochemistry); (B.Sc.(Hons) Zoology); (M.Sc. Conservation Ecology); (Ph.D. Medical Biosciences) **Quzette Bosman** (BA Geography/Sociology); (BA (Hons) Environmental Management) **Hardus Schoeman** (B.Sc. Geology/Chemistry); (B.Sc. (Hons.) Hydrology/Hydrogeology); (M.Sc. Hydrology/Hydrogeology) **Pierre Botha** (B.Sc. Geology/Geography); (B.Sc. (Hons) Hydrology/Hydrogeology) **Surene Botha** (B.Sc. Geology/Geochemistry); (B.Sc. (Hons.) Geology); (M.Sc. Hydrology/Hydrogeology)	
Cite this document as:	Faul A, Bosman Q, Schoeman H, Botha P, Botha S. 2024 November Exploration Activities on Exclusive Prospecting License (EPL) Area 8049 in the Khomas Region: Environmental Assessment Scoping Report	
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Report Approval:	André Faul	

I, _____, hereby approve this report and confirm that the project description contained in herein is a true reflection of the information which the Proponent has provided to Geo Pollution Technologies. All material information in the possession of the Proponent that reasonably has or may have the potential of influencing any decision or the objectivity of this assessment is fairly represented in this report.

Signed at _____ on the _____ day of _____ 2024.

_____ 2013/0251_____

Votorantim Metals Namibia (Pty) Ltd Company Registration Number

EXECUTIVE SUMMARY

Introduction

Votorantim Metals Namibia (Pty) Ltd (VMN or the Proponent) is a prospecting company registered in Namibia. Through the Ministry of Mines and Energy (MME), VMN has exclusive prospecting licenses (EPLs) across Namibia, focusing specifically on prospecting for base, rare and precious metals.

The Proponent, received an "Intention to Grant" from the Ministry of Mines and Energy for their application for exclusive prospecting licence (EPL) 8049 in the Khomas Region. The EPL is located over land zoned for agricultural purposes, which consists of several farms, and will be granted to the Proponent upon successful acquisition of an environmental clearance certificate (ECC) for the EPL area. Geo Pollution Technologies (Pty) Ltd (GPT) was appointed by the Proponent, as independent environmental consultant, to assist with the necessary studies to determine the potential environmental impacts, and ultimately whether an ECC may be granted for this EPL. To achieve this, an environmental scoping assessment was undertaken to determine the potential positive and negative impacts of the Proponent's proposed exploration activities, on the environment.

Scope and Methodology

The environmental assessment is conducted to determine all environmental, safety, health and socio-economic impacts associated with the operations of the facility. Relevant environmental data was compiled using secondary data, and a reconnaissance site visit. Potential environmental impacts and associated social impacts were identified and are addressed in this report.

Project Description

Activities conducted for the exploration of mineral resources consist of both remote and field assessments. Remote work include studying existing literature that provide information on previously gathered geological and mineral data for the area of interest. A large part of remote work also involves studying and analysing satellite and aerial photography images. Technological advancements in these imagery methods have made it possible to gather a vast amount of data on both the surface and subsurface geology. Based on the remote work, an area of interest may be defined for field work. Field work will entail visiting the area and making observations regarding the surface geology. Soil and rock samples can also be collected for analysis. Various scientific techniques for surveying the subsurface may also be employed. This does not entail digging large holes or trenching, but may require some vegetation clearing where dense vegetation restricts access. Only when sufficient information is gathered, with the above methods to identify potential mineable areas, will exploration drilling be undertaken. Such drilling allows for the collection of subsurface material, at varying depths, for analysis. Any areas impacted by drilling will be rehabilitated to allow for rapid vegetation reestablishment and prevent erosion. After all exploration activities are complete, and all data has been analysed and processed, it is determined whether there are any minable resources within the EPL. Should there be minable resources, a mining licence application must be lodged, which will require its own, environmental assessment based on mining related operations, as opposed to this ECC, which is for prospecting activities.

Public Participation

As part of the environmental assessment process, public consultation was performed. This entailed placing two site notices at the eastern and western EPL boundaries on a main road crossing the EPL area, placing advertisements in two national newspapers, and notifying land owners, identified interested and affected parties and relevant authorities. All comments and concerns are addressed in the comments and responses table of this report.

Major Impacts Associated with Exploration Activities

Positive impacts arising from the exploration project include employment, training and development of the Namibian workforce; increased economic resilience of employees and contractors; economic injection into the Namibian economy through the sourcing of goods and services, often with funds obtained from foreign investors; remuneration of landowners as is determined through surface access agreements; generation of new knowledge on, amongst others, the local geology and ecology of the exploration area; and potential discoveries of feasible minable mineral resources.

Negative impacts of exploration entails limited ecological disturbances where vegetation needs clearing for exploration. Pollution of the environment can occur when there are hydrocarbon leaks from drilling equipment and vehicles, or where waste is not contained and removed from site. Such pollution also presents a significant risk to groundwater, which is already a scarce resource in the area. Poaching is a big concern for land owners and criminals may seize the opportunity to pose as a member of the exploration team to gain access to the land. Fire, dust, erosion, noise and deterioration of farm roads are also impacts associated with exploration.

Management of Impacts

Positive impacts can be enhanced by supporting local industries and contractors and appointment of local Namibian employees, as far as is practically possible. It should however be noted that the technologies are sometimes highly specialised and new to Namibia and may then require international expertise.

Negative impacts related to exploration will be limited by adherence to environmental management procedures and accepted industry standards. Explorations teams and their vehicles being clearly distinguishable through uniforms, ID tags and vehicle branding. The footprint of vegetation clearing must be limited to only the necessary areas and the removal of protected species must be avoided as far as possible. Vehicles should at all times adhere to the speed limits imposed by the Proponent in order to prevent dust, noise and road damage. All waste must be contained and removed from site; all machinery must be inspected and maintained to prevent leaks. Spill control measures must be in place in order to contain spills and prevent it from entering soil or groundwater. Firefighting equipment and training is pertinent to prevent and respond to fires.

The Proponent must reach a surface access agreement with all land owners prior to accessing the EPL. Land owners must be notified in advance of when exploration teams will be onsite and all activities should be restricted to day time. Any deviation from this should be communicated to land owners without delay. Exploration teams must remain within agreed areas and should report any suspicious activities or incidents to the land owner.

The environmental management plan included in section 10.1 of this document should be used as an on-site reference document for planning, exploration and decommissioning activities. All monitoring and records kept should be included in a report to ensure compliance with the environmental management plan and environmental clearance certificate conditions. A health, safety, environment and quality policy, or similar, could be used in conjunction with the environmental management plan. Operators and responsible personnel must be taught the contents of these documents. National regulations and guidelines must be adhered to and monitored regularly as outlined in the environmental management plan.

Conclusion

Based on the environmental assessment there is no reason why exploration cannot continue within the EPL. The environmental management plan as presented in this document should be adopted and the contents kept up-to-date as legislation, equipment and operational methods and conditions change.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency Syndrome
BID	Background Information Document
CBD	Convention on Biological Diversity
CHIRPS	Climate Hazards Group Infra-Red Precipitation with Station data version
CITES	Convention on International Trade of Endangered Species
DEA	Department of Environmental Affairs
DWA	Department of Water Affairs
ECC	Environmental Clearance Certificate
EMA	Environmental Management Act, 2007 (Act no. 7 of 2007)
EMP	Environmental Management Plan
EMS	Environmental Management System
EPL	Exclusive Prospecting Licence
GDP	Gross Domestic Product
GPT	Geo Pollution Technologies (Pty) Ltd
HIV	Human Immunodeficiency Virus
HSE	Health, Safety and Environment
IAP	Interested and Affected Party
IUCN	International Union for Conservation of Nature
KWH	Kilowatt Hour
m/s	Meter per second
MARC	Minerals Ancillary Rights Commission
mbs	Meters below surface
MEFT	Ministry of Environment, Forestry and Tourism
MERRA-2	Modern-Era Retrospective analysis for Research and Applications version 2
mm/a	Millimetres per annum
MME	Ministry of Mines and Energy
MSDS	Material Safety Data Sheet
NASA	National Aeronautics and Space Administration
NDP	National Development Plan
PPE	Personal Protective Equipment
QDS	Quarter Degree Square
SANS	South African National Standards
TDS	Total Dissolved Solids
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
uPVC	Unplasticized polyvinyl chloride
VMN	Votorantim Metals Namibia
WHO	World Health Organization

GLOSSARY OF TERMS

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The "no-go" alternative constitutes the 'without project' option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Biodiversity - The variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part.

Competent Authority - Means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

Cumulative Impacts - In relation to an activity, means the impact of an activity that in itself 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.

Mineral Exploration – The process of searching for concentrated deposits of minerals for the ultimate purpose of mining for economic benefit.

Environment - As defined in the Environmental Assessment Policy and Environmental Management Act - "land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, palaeontological or social values".

Environmental Assessment (EA) – Namibian terminology for a process of assessing the effects on the environment through either a scoping assessment or a combination of a scoping- and detailed assessment.

Environmental Management Plan (EMP) - A working document on environmental and socio-economic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

Environmental Management System (EMS) - An Environment Management System, or EMS, is a comprehensive approach to managing environmental issues, integrating environment-oriented thinking into every aspect of business management. An EMS ensures environmental considerations are a priority, along with other concerns such as costs, product quality, investments, PR productivity and strategic planning. An EMS generally makes a positive impact on a company's bottom line. It increases efficiency and focuses on customer needs and marketplace conditions, improving both the company's financial and environmental performance. By using an EMS to convert environmental problems into commercial opportunities, companies usually become more competitive.

Evaluation – Means the process of ascertaining the relative importance or significance of information, the light of people's values, preference and judgements in order to make a decision.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Hyperspectral Imaging - A technique that captures and processes a wide spectrum of light beyond the visible range (which includes the colours humans can see). Unlike traditional imaging, which only captures three bands of colour (red, green, and blue), hyperspectral imaging divides the light spectrum into many more narrow bands, sometimes hundreds or even thousands, across wavelengths that include the ultraviolet, visible, and infrared regions.

Interested and Affected Party (IAP) - Any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the

activity.

Mineral – A natural substance with unique and distinctive physical and chemical properties. In terms of mining, "economic minerals" include metals and hydrocarbons.

Mitigate - The implementation of practical measures to reduce adverse impacts.

Proponent (Applicant) - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act No. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment Forestry and Tourism.

Public - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Scoping Process - Process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

Significant Effect/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.

Stakeholder Engagement - The process of engagement between stakeholders (the proponent, authorities and IAPs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term "public participation".

Stakeholders - A sub-group of the public whose interests may be positively or negatively affected by a proposal or activity and/or who are concerned with a proposal or activity and its consequences. The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (IAPs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

Sustainable Development - "Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations" – the definition of the World Commission on Environment and Development (1987). "Improving the quality of human life while living within the carrying capacity of supporting ecosystems" – the definition given in a publication called "Caring for the Earth: A Strategy for Sustainable Living" by the International Union for Conservation of Nature (IUCN), the United Nations Environment Programme and the World Wide Fund for Nature (1991).

1 INTRODUCTION

Votorantim Metals Namibia (Pty) Ltd (VMN or the Proponent) is a prospecting company registered in Namibia. Through the Ministry of Mines and Energy (MME), VMN has exclusive prospecting licenses (EPLs) across Namibia, focusing specifically on prospecting for base, rare and precious metals.

The Proponent, received an "Intention to Grant" from the Ministry of Mines and Energy in respect of their application for exclusive prospecting licence (EPL) 8049 in the Khomas Region. The EPL will be granted to the Proponent upon successful acquisition of an environmental clearance certificate (ECC) for the EPL area, as indicated in Figure 1-1. The EPL is for base and rare metals, industrial minerals and precious metals. The EPL is located over land zoned for agricultural purposes which consists of several farms and smallholdings.

An ECC for the proposed exploration activities in the EPL area is required as per the Environmental Management Act, Act No. 7, of 2007 (EMA). As such, Geo Pollution Technologies (Pty) Ltd (GPT) was appointed by the Proponent, as independent environmental consultant, to assist with the necessary studies to determine the potential environmental impacts, and ultimately whether an ECC may be granted for this EPL. To achieve this, an environmental scoping assessment was undertaken to determine the potential positive and negative impacts of the Proponent's proposed exploration activities, on the environment. The results of this assessment is documented in this report, and it is accompanied by an environmental management plan (EMP) aimed at preventing or mitigating negative environmental impacts, while simultaneously promoting positive spinoffs from the project.

In terms of this study, the environment is defined as per the EMA's definition, as follows:

"land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values"

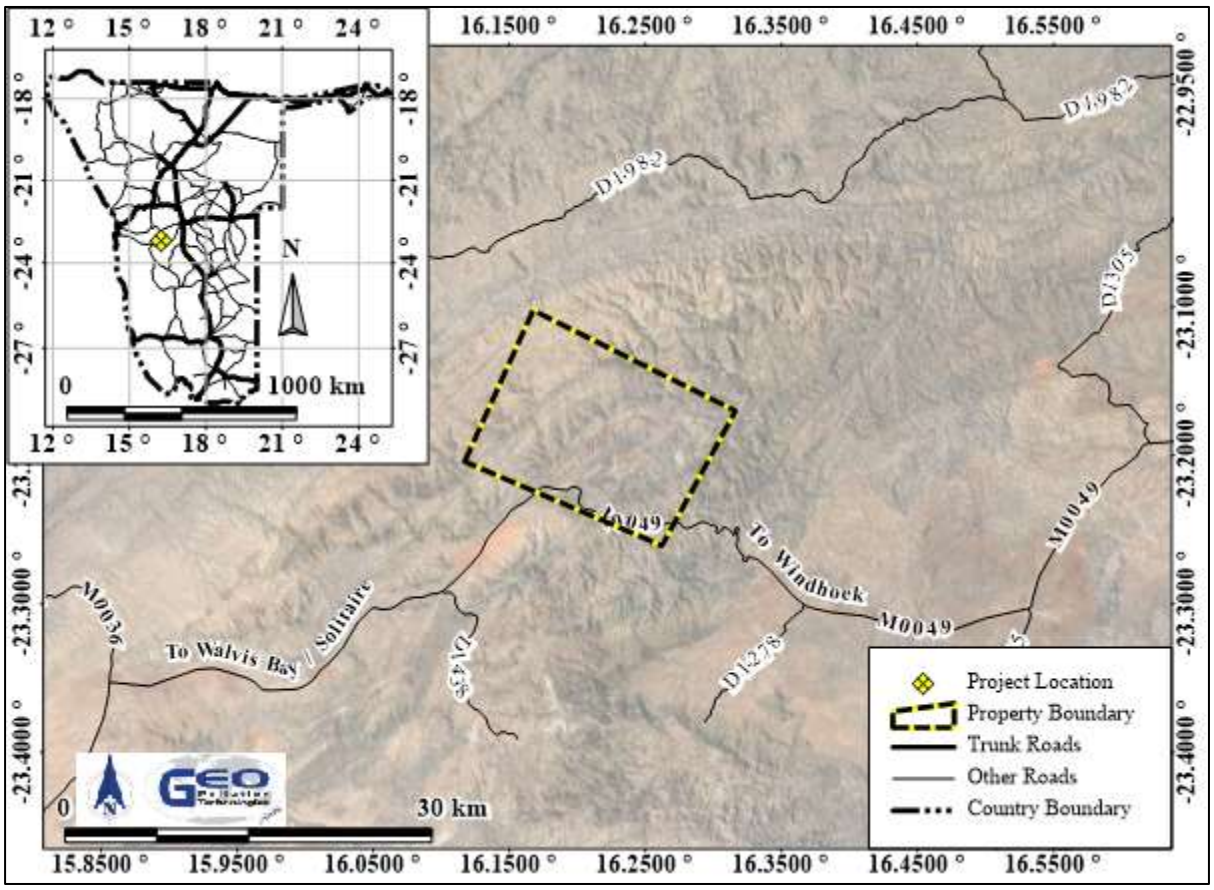


Figure 1-1 Project location

Project Justification – Namibia is rich in mineral resources, with large parts of the country remaining relatively unexplored. The Minerals (Prospecting and Mining) Act of 1992 declares that all natural resources, including minerals, are owned by the government. It further states that no reconnaissance operations, prospecting operations or mining operations may be carried out without a licence as issued under the Act. Therefore, the responsibility to find, and ultimately extract, mineral resources lies with authorised licence holders who adhere to all regulations governing prospecting and mining.

The mining sector is one of the main contributors to employment and Namibia's gross domestic product (GDP). While exploration activities do so to a lesser degree, mining cannot commence until exploration activities indicate feasible resources. Benefits of exploration therefore include:

- Employment, training and development of the Namibian workforce.
- Increased economic resilience of employees and contractors.
- Economic injection into the Namibian economy through the sourcing of goods and services, often with funds obtained from foreign investors.
- Remuneration of landowners as is determined through access agreements.
- Generation of new knowledge on, amongst others, the local geology and ecology of the exploration area.
- Potential discoveries of feasible minable mineral resources.

2 SCOPE

The scope of the environmental assessment is to, in compliance with Namibia's Environmental Management Act (2007):

- Provide a description of the proposed exploration activities.
- Provide an overview of the local environment within the exploration area.
- Determine the potential environmental impacts that may potentially emanate from exploration activities.
- Identify a range of management actions which could prevent or mitigate the potential adverse impacts to acceptable levels.
- Provide sufficient information to the Ministry of Environment, Forestry and Tourism (MEFT) and related authorities to make an informed decision regarding the exploration activities and the granting of an ECC and EPL.

3 METHODOLOGY

The following methods were used to investigate the potential impacts on the social and natural environment due to the proposed exploration activities:

- Baseline information about the site and its surroundings was obtained from existing secondary information as well as from primary information obtained during a reconnaissance site visit.
- As part of the scoping process to determine potential environmental impacts, interested and affected parties (IAPs) were consulted about their views, comments and opinions and these are put forward in this report.
- Based on gathered information and public and stakeholder consultation, an assessment of potential impacts was conducted and a management plan prepared.

4 LIMITATIONS

Not all owners of the farms were willing to engage with, or allow entry onto their farms, during the site visit. No specific information on potential sensitive areas or artefacts for these farms could thus be obtained.

5 PROJECT DESCRIPTION

Mineral exploration typically does not require any construction activities within the EPL. Project activities performed for purposes of exploring for the relevant commodities (base and rare metals, industrial minerals and precious metals) include both off and on site activities. These are literature reviews, remote sensing, field surveys, geophysical surveys, geochemical sampling and exploratory

drilling. Photo 5-1 to Photo 5-14 as presented below, are of actual exploration activities if VMN on EPLs in Namibia.

5.1 LITERATURE REVIEWS

Literature reviews, or desktop studies, are usually already started prior to application for an EPL. Existing literature and scientific data (e.g. geological data and information obtained from the Ministry of Mines and Energy) are researched in order to determine whether a specific area is known to have minerals, or is likely to have minerals. Should the prospects be positive, an application for an EPL over the identified area is lodged. Literature reviews will continue after the EPL is granted, should more literature and documentation be available.

5.2 REMOTE SENSING

Technological advancements in satellite imagery have revolutionised exploration activities and can provide a vast amount of information. It requires specialist manipulation and interpretation to determine the potential presence of minerals in a specific area. The simplest form is using standard satellite imagery and aerial photography to develop detailed geological maps, without having to be in the field. This way, surface structures prone to hosting mineral resources can be identified.

More complex methods of remote sensing also exist and hyperspectral imaging can, for example, provide more information by identifying of specific minerals based on the spectral signatures they produce. A hyperspectral camera captures light from the earth's surface and separates and presents it in its different wavelengths. Each pixel in the image represents a specific spectrum of light which is used to identify the material based on known spectral signatures.

Drone technology has also improved significantly over the last decade, and when equipped with ground penetrating radar, can give detailed information of the subsurface structures such as geological structures, mineral deposits and voids. Drones can access areas where rough terrain makes entry by vehicle very difficult, and can thus reduce intrusiveness, time and costs associated with traditional exploration methods.

5.3 FIELD SURVEYS

Through literature reviews and remote sensing, smaller areas of interest are identified within the EPL. Actual in-field surveys will focus on these areas of interest. It typically involves geologists studying the areas on foot. Any aboveground structures, rocks and features which could not be identified via remote sensing, are recorded and mapped. This complements the existing information gathered for the area and may further reduce the area of interest. Field surveys are not typically very invasive and destructive in nature.

5.4 GEOPHYSICAL SURVEYS

Some geophysical surveys can be achieved via remote sensing (e.g. ground penetrating radar) while others require field work. Examples of typical geophysical surveys that the Proponent may conduct are:

Electrical resistivity tomography: This method produces a subsurface "image" by measuring electrical resistivity of the ground. It requires the placement of electrodes directly into the ground, either along a straight line or in a grid. A known electrical current is passed into the ground via a pair of electrodes and the voltage difference is measured between other pairs of electrodes. The voltage difference is then used to calculate the resistivity of the subsurface and is presented as a resistivity profile or tomogram. Based on known resistivity values of materials, the composition and properties of the subsurface can be inferred.

Induced Polarization: It is used to identify subsurface materials by measuring their electrical chargeability. As with electrical resistivity tomography, an electrical current is again injected into the ground. Materials like sulphide minerals, clays and graphite become polarized (i.e. temporarily store electrical charge). When the current is stopped, the stored charge is released and this is measurable as voltage decay.

Audio-Magnetotelluric Surveys: This method measures variations in natural electromagnetic fields to investigate the subsurface. Sensors placed on the ground measures the electric and magnetic fields and the results are used to calculate subsurface resistivity values. These in turn provide information on the different geological structures and materials.

For all three methods above, the area (line or grid) to be surveyed requires some clearing of vegetation in order to provide access and bare ground for placement of equipment. For electrical resistivity tomography and induce polarisation, shallow, small diameter holes (not more than 50 cm deep and 2 cm in diameter) in the ground are required for the placement of electrodes. Overall, these techniques are less invasive than exploratory drilling. Based on the results, the area of interest may be reduced in size, to focus on areas with greater potential for minerals.

Photo 5-1 Example of a geophysical survey

Photo 5-2 Cleared line for geophysical survey

5.5 GEOCHEMICAL SAMPLING

Geochemical sampling will entail the collection of soil and rock material from the surface or shallow subsurface. This may entail some shallow localised digging making use of manual labour. The Proponent does not make use of trenching. Samples are analysed for mineral content and provides valuable information on the potential presence of mineral resources. Geochemical sampling may be conducted at the same time as field surveys.

Photo 5-3 Soil sampling

Photo 5-4 Meticulous record keeping

5.6 EXPLORATION DRILLING

Once all the information from the above methods have been compiled and analysed, very specific areas may be targeted for exploratory drilling. Drilling will mainly be performed with a diamond core drill that may be self-propelled with tracks or wheels, or mounted on a truck. The diamond core drill extracts cylindrical samples (cores) from the subsurface which can be studied and analysed to understand the geology and presence of minerals at that specific location. Drilling can, however, also be reverse circulation drilling which produces drill chips and not cores.

Drill depth is typically about 300 m, but can, depending on local conditions, be up to 550 m. The first 100 m of the borehole usually has a diameter of 96 mm and from there on 75.7 mm. In some cases, depending on local geology, the first 100 m may have to be drilled to have a 122.6 mm diameter. Larger and smaller diameter borehole drilling are available, but are generally not used by the Proponent.

Level drill pads will be created at each drill target to allow for placement of the drill rig (Photo 5-5 and Photo 5-6). This may require removal of vegetation in the drilling and laydown area. The drill site will be fenced off with a temporary wire mesh fence. For diamond core drilling the hollow drill bit is impregnated with industrial grade diamonds for cutting through rock. As the drill bit is pushed into the ground, the core sample is collected in the hollow drill bit. Periodically the dill string is lifted to the surface, the core collected and stored in core trays, and detailed notes made on the depth at which the core was collected. Water or drilling fluid is circulated in the borehole to cool down and lubricate the drill bit. This ensures the longevity of the drill bit. The liquid expelled from the borehole is directed into a series of drilling fluid sumps, where solids settle out and the relatively clean liquid from the last sump are re-used. The sumps are typically shallow excavations in the soil, line with plastic sheeting.

For reverse circulation drilling the drill rod is inside a tube and high pressure air generated by a compressor is forced down the space between the rod and tube. This forces drill cuttings and dust up the hollow drill string to the surface. At the surface dust is mostly blown away and the drill chips are collected in separate bags / containers corresponding to set depth intervals.

Restricted areas in the drill site will be demarcated with danger tape and signage to indicate dangerous areas. Support infrastructure at the drill camp will include a diesel bowser, possibly a compressor if reverse circulation drilling is conducted, a water tanker, spare parts and equipment, tents, portable toilets and showers, cooking facilities, firefighting equipment, etc. Once drilling is complete, the borehole will be capped and marked (Photo 5-9 indicates the casing of an uncapped borehole). The area will be cleared of all infrastructure, waste products, etc., and the area rehabilitated.

5.7 REHABILITATION

Areas that are impacted by the exploration activities will be rehabilitated. The rehabilitation measures to be undertaken are discussed with the landowner and included in surface access agreements. For example, where the landowner which to keep a new road created by the Proponent, it will not be rehabilitated. However, where the landowner does not need a cleared area, it will be rehabilitated. This may include light ripping to loosen compacted soil and promote vegetation growth, and contouring to prevent erosion. Vegetation re-growth is reliant on rain. Follow-up visits to the sites are also conducted to ensure no erosion takes place and natural vegetation re-establishes. Photo 5-10 shows a drilling site in the early stages of rehabilitation.

Photo 5-5 Core drilling site

Photo 5-6 Core drilling site

Photo 5-7 Safety signage and demarcation of restricted areas at drill site

Photo 5-8 Firefighting equipment at drill site

Photo 5-9 Borehole

Photo 5-10 Rehabilitated drill site

5.8 GENERAL

Prior to any access to the EPL area, surface access agreements will be negotiated and signed with the land owners. Such agreements will clearly stipulate the landowners' requirements, expectations and compensation. The first agreement will cover activities up to geophysical surveys and geochemical sampling. Should a target site for core drilling be identified, a new agreement will be reached with the land owner.

Four wheel drive vehicles, numbered and marked as being the property of the Proponent, will be used to transport staff to the site and back. Access to target areas on the farm will at all times be via existing roads, or where no roads are present, roads will be made as per agreements reached with land owners. Such roads will preferably be made by means of manual labour in order to

reduce the impact on the soil. The Proponent's team will only access the farm during the day between 08:00 and 17:00 and only during pre-arranged schedules. In the eventuality of an emergency or delay, where the team will be on the land outside these hours, the land owner will be contacted. The Proponent's team will wear easily recognisable clothing with reflector vests.

The Proponent's staff will always make use of established off-site accommodation establishments, unless the land owner themselves have such facilities available or if there are no nearby facilities. Only in the latter case, arrangements will be made with the land owner for a temporary accommodation camp on the farm. A temporary campsite may then be required in the drilling area.

Waste will be collected in designated bins (Photo 5-11) and removed on a regular basis. Waste will be transported to an approved municipal or designated dumping site. Where a bin is not available nearby during work (e.g. during field surveys), waste will be contained and taken directly to a bin when departing for the day. Spill kits for any hydrocarbons will at all times be present during drilling (Photo 5-12).

Mobile chemical toilets are used where a team is stationed in the same area for an extended period (e.g. at a camping site) (Photo 5-13). The contents of the toilets are collected in tanks and removed from the site for disposal at a designated sewage disposal area.

Water used for drilling will, if agreed upon, be obtained from the farmer. Where sufficient water is not available, a new borehole may need to be drilled or water will be carted to the site with a water tanker. Drinking water will be supplied by the Proponent.

Once drilling is complete, the boreholes will be cased and capped or it will be backfilled. All waste and infrastructure will be removed from site. The drill pad and surroundings will be ripped and contoured, if needed, to allow for easy re-establishment of vegetation. All roads not needed for future use by the landowner will also be rehabilitated.

Photo 5-11 Waste bin

Photo 5-12 Spill kit

Photo 5-13 Mobile chemical toilet

Photo 5-14 Designated smoking area

6 ALTERNATIVES

6.1 LOCATION ALTERNATIVES

The project location (EPL area) is dictated by the suspected presence of mineral resources and as determined by the Ministry of Mines and Energy. Alternative locations in terms of the project location are thus not considered in this assessment. Within the EPL area, the Proponent can however consider alternatives, as far as is practical, in terms of the areas that may require clearing for geophysical surveys, roads, drilling pads, etc. Such alternatives will in part be limited by the target. If a target is within a very small footprint, geophysical surveys and drilling cannot be moved out of that footprint. However, roads leading to these areas, that may need to be cleared, should consider the avoidance of habitats with dense or unique indigenous or protected vegetation, avoiding areas with nests or burrows, as well as land owner preference.

6.2 EXPLORATION ACTIVITIES

The Proponent already implements various alternatives in their approach to exploration in order to reduce the potential impact on the environment and the land owners. These are summarised in Table 6-1.

Table 6-1 Alternative comparison table

Alternative Description	Advantages	Disadvantages	Preferred Alternative
Clearing Method for Roads, Drill Pads, Etc.			
Bulldozer	Time saving Can easily clear and level difficult terrain Less labourers on site which may be favoured by land owner	Heavy machinery compacts ground (ecologically unfriendly) Less employment Fixed width of cleared area which may be wider than needed	Manual labour as far as is practically possible
Manual Clearing (Labourers with axes, spades etc.)	More employment Ecologically more friendly Can keep footprint of impact to a minimum	Time consuming More labourers on the land which may not be favoured by land owner More vehicle movement to transport labourers Not suited for very difficult or hard to reach areas	

The assessment of impacts is based on the use of the preferred alternatives as presented above. The preferred alternatives have further been incorporated into the EMP.

7 ADMINISTRATIVE LEGAL AND POLICY REQUIREMENTS

To protect the environment and achieve sustainable development, all projects, plans, programmes and policies deemed to have adverse impacts on the environment require an environmental assessment, as per the Namibian legislation. The legislation and standards provided in Table 7-1 and Table 7-3 govern the environmental assessment process in Namibia and/or are relevant to the mineral resources exploration sector.

Table 7-1 Namibian law applicable to the project

Law	Key Aspects
The Namibian Constitution	♦ Promotes the welfare of people ♦ Incorporates a high level of environmental protection ♦ Incorporates international agreements as part of Namibian law
Environmental Management Act Act No. 7 of 2007, Government Notice No. 232 of 2007	♦ Defines the environment ♦ Promotes sustainable management of the environment and the use of natural resources ♦ Provides a process of assessment and control of activities with possible significant effects on the environment
Environmental Management Act Regulations Government Notice No. 28-30 of 2012	♦ Commencement of the Environmental Management Act ♦ Lists activities that requires an environmental clearance certificate ♦ Provides Environmental Impact Assessment Regulations
Minerals (Prospecting and Mining) Act Act 33 of 1992, Government Notice No. 199 of 1992	♦ Provides for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and provides for matters incidental thereto
Soil Conservation Act Act No. 76 of 1969	♦ Law relating to the combating and prevention of soil erosion, the conservation, improvement and manner of use of the soil and vegetation and the protection of the water sources in Namibia
Water Resources Management Act Act No. 11 of 2013	♦ Provides for management, protection, development, use and conservation of water resources ♦ Prevention of water pollution and assignment of liability ♦ Requires permitting for all borehole drilling activities in Namibia
Water Resources Management Act Regulations Government Notice No. 332 of 2023	♦ Regulations pertaining to the management, protection, development, use and conservation of water resources ♦ Provides for the regulation and monitoring of water services and to provide for incidental matters ♦ Requires permitting for all borehole drilling activities in Namibia
Forest Act (Act 12 of 2001, Government Notice No. 248 of 2001)	♦ Makes provision for the protection of the environment and the control and management of forest fires ♦ Provides the licencing and permit conditions for the removal of woody and other vegetation as well as the disturbance and removal of soil from forested areas

Law	Key Aspects
Forest Regulations: Forest Act, 2001 Government Notice No. 170 of 2015	♦ Declares protected trees or plants ♦ Issuing of permits to remove protected tree and plant species
National Heritage Act (Act No. 27 of 2004, Government Notice No. 287 of 2004)	♦ Provides for protection and conservation of places and objects of heritage significance and the registration of such places and objects
Petroleum Products and Energy Act Act No. 13 of 1990, Government Notice No. 45 of 1990	♦ Regulates petroleum industry ♦ Makes provision for licencing and safe storage and handling of fuels ♦ Petroleum Products Regulations (Government Notice No. 155 of 2000)
Public and Environmental Health Act Act No. 1 of 2015, Government Notice No. 86 of 2015	♦ Provides a framework for a structured more uniform public and environmental health system, and for incidental matters ♦ Deals with Integrated Waste Management including waste collection disposal and recycling; waste generation and storage; and sanitation
Labour Act Act No 11 of 2007, Government Notice No. 236 of 2007	♦ Provides for Labour Law and the protection and safety of employees ♦ Labour Act, 1992: Regulations relating to the health and safety of employees at work (Government Notice No. 156 of 1997)
Minerals Policy Of Namibia	♦ Aims to achieve a high level of responsible development of national resources in which Namibia becomes a significant producer of mineral products while ensuring maximum sustainable contribution to the socio-economic development of the country ♦ To attract investment and enable the private sector to take the lead in exploration, mining, mineral beneficiation and marketing ♦ Government will provide the Minerals Ancillary Rights Commission (MARC) with clear guidelines on the process for access to land and the provision of compensation
Nature Conservation Ordinance Ordinance No. 4 of 1975	♦ Consolidates and amends the laws relating to the conservation of nature and the establishment of game parks and nature reserves ♦ Assigns certain conservation categories to specific organisms within Namibia
Atmospheric Pollution Prevention Ordinance Ordinance No. 11 of 1976	♦ Governs the control of noxious or offensive gases ♦ Prohibits scheduled process without a registration certificate in a controlled area ♦ Requires best practical means for preventing or reducing the escape into the atmosphere of noxious or offensive gases produced by the scheduled process
Hazardous Substances Ordinance Ordinance No. 14 of 1974	♦ Applies to the manufacture, sale, use, disposal and dumping of hazardous substances as well as their import and export ♦ Aims to prevent hazardous substances from causing injury, ill-health or the death of human beings
Pollution Control and Waste Management Bill (draft document)	♦ Not in force yet ♦ Provides for prevention and control of pollution and waste ♦ Provides for procedures to be followed for licence applications

Law	Key Aspects
Road Traffic and Transport Act Act No. 52 of 1999 Government Notice No 282 of 1999	♦ Provides for the control of traffic on public roads and the regulations pertaining to road transport
Road Traffic and Transport Regulations Government Notice No 53 of 2001	♦ Prohibits the transport of goods which are not safely contained within the body of the vehicle; or securely fastened to that vehicle, and which are not properly protected from being dislodged or spilled from that vehicle

Table 7-2 Standards or codes of practise

Standard or Code	Key Aspects
South African National Standards (SANS)	♦ The Petroleum Products and Energy Act prescribes SANS standards for the construction, operations and demolition of petroleum facilities. ♦ SANS 10131 is specifically aimed at storage and distribution of petroleum products in aboveground storage tanks. ♦ Provides requirements for spill control infrastructure.

Table 7-3 Relevant multilateral environmental agreements for Namibia related to the project

Agreement	Key Aspects
SADC Protocol on Mining, 1997	♦ Member states agree to share information on exploitable mineral resources in the region, enhance the technological capacity of the sector as well as promote policies that will encourage and assist small scale mining ♦ Environmental and occupational health and safety issues are highlighted
Stockholm Declaration on the Human Environment, Stockholm 1972.	♦ 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
1985 Vienna Convention for the Protection of the Ozone Layer	♦ Aims to protect human health and the environment against adverse effects from modification of the Ozone Layer are considered ♦ Adopted to regulate levels of greenhouse gas concentration in the atmosphere
United Nations Framework Convention on Climate Change (UNFCCC)	♦ The Convention recognises that developing countries should be accorded appropriate assistance to enable them to fulfil the terms of the Convention
Convention on Biological Diversity, Rio de Janeiro, 1992	♦ Under article 14 of The Convention, EIAs must be conducted for projects that may negatively affect biological diversity

Exploration is listed as an activity requiring an ECC as per Government Notice No. 29 of 2012. Ancillary activities related to exploration may also be listed as activities requiring ECCs. The following is a list of possible activities that the Proponent may engage in, in order to perform exploration.

Mining and Quarrying Activities

3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.

3.2 Other forms of mining or extraction of any natural resource whether regulated by a law or not.

3.3 Resource extraction, manipulation, conservation and related activities.

Forestry Activities

4 The clearance of forest areas, deforestation, aforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law.

Additional national planning legislation considered include:

- National Development Plans (NDPs) and Vision 2030
- Namibia's Climate Change Strategy and Action Plan

Mining is a crucial component of Namibia's NDPs, particularly also in the country's long-term vision, Vision 2030. Its integration into the NDPs highlights its importance in achieving Namibia's broader economic and social goals. Some key aspects of mining in Namibia's overall development plan and vision include:

Economic Contribution: Mining contributes significantly to Namibia's GDP, export earnings, and employment. The sector is recognised as being vital for economic growth and diversification.

Strategic Focus: Previous NDPs and the upcoming NDP6, emphasise the development of the mining sector to ensure sustainable economic growth. Investment in mining is promoted and so is enhancement of value addition and environmental sustainability.

Policy Framework: Guiding principles for the development of the mining sector is present in the Minerals Policy of Namibia. It aims to create a conducive environment for investment, ensure the sector's sustainability, and maximise benefits for the Namibian people.

Recent Developments: The mining sector has seen promising developments, including establishment of new mines and the high prices of commodities like gold and uranium. These are expected to fuel further growth.

Since mining forms such a significant part of Namibia's economy, its integration into the Climate Change Strategy and Action Plan is crucial for sustainable development. Key aspects that feeds into this strategy are:

Sustainable Practices: The adoption of sustainable mining practices to minimise environmental impact is emphasised. This includes measures to reduce water usage, manage waste, and rehabilitate mining sites.

Renewable Energy: The use of renewable energy sources in mining operations are promoted. This will help to reduce greenhouse gas emissions while supporting Namibia's broader goal of increasing the share of renewable energy in its energy pool.

Community Resilience: Community-based adaptation programs are promoted with the aim of building resilience in local communities by supporting initiatives like agro-forestry, water conservation, and energy-efficient technologies.

Policy and Regulation: Policies and regulations to ensure that mining activities align with climate adaptation goals. This includes stringent environmental impact assessments and the enforcement of best practices in mining operations.

Research and Innovation: Research and innovation to develop new technologies and methods for more sustainable mining and resilience to climate change.

8 ENVIRONMENTAL CHARACTERISTICS

This section lists the most important environmental characteristics of the study area and provides a statement on the potential environmental impacts on each.

8.1 LOCALITY AND SURROUNDING LAND USE

The EPL area is 19,718.2822 ha in size and lies in the western part of the Khomas Region. It is in the Windhoek District's Windhoek Rural Constituency. Windhoek is situated 100 km northeast of the EPL's eastern corner while Walvis Bay is approximately 165 km west of the western corner.

The EPL overlaps various farms zoned for agricultural use (Figure 8-1). All except one are privately owned. Only Farm Bonna is owned by the Government of the Republic of Namibia. A number of lodges and guest farms are located on neighbouring farms in the area.

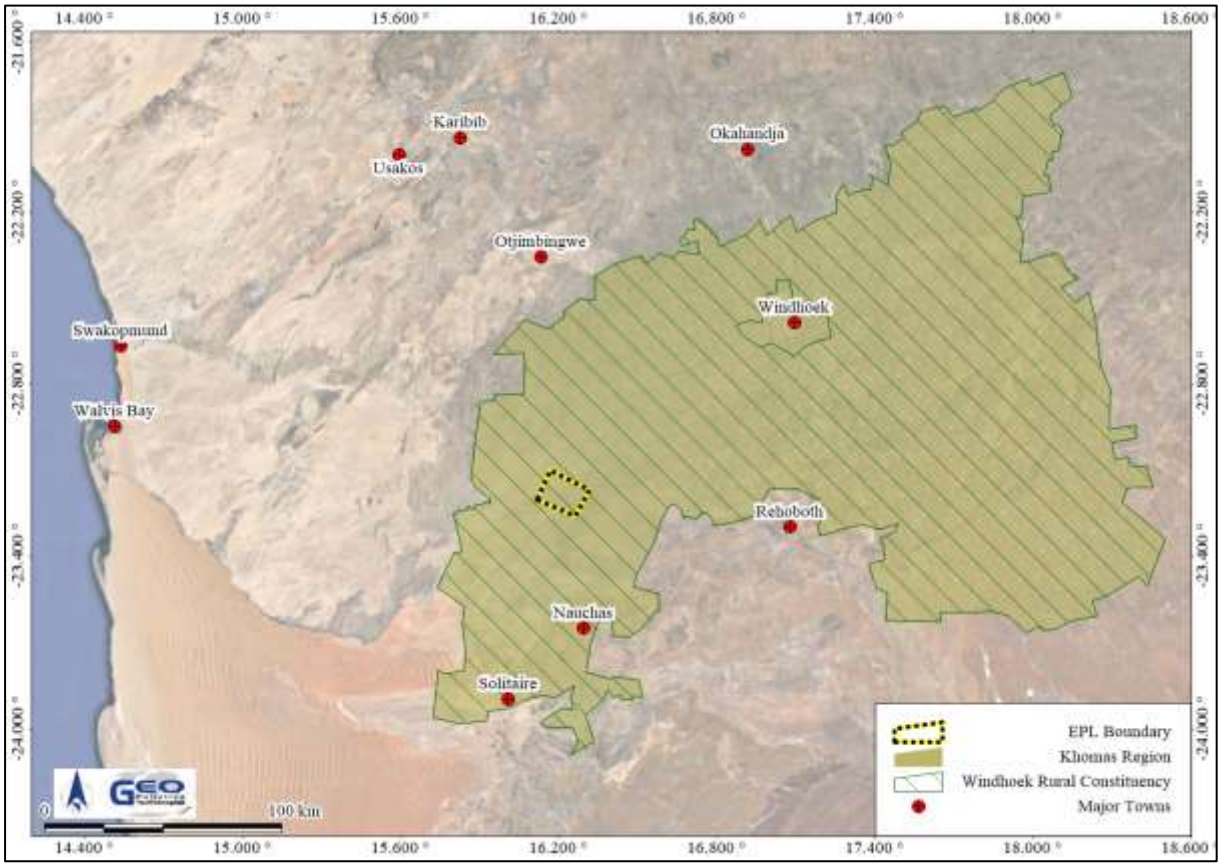
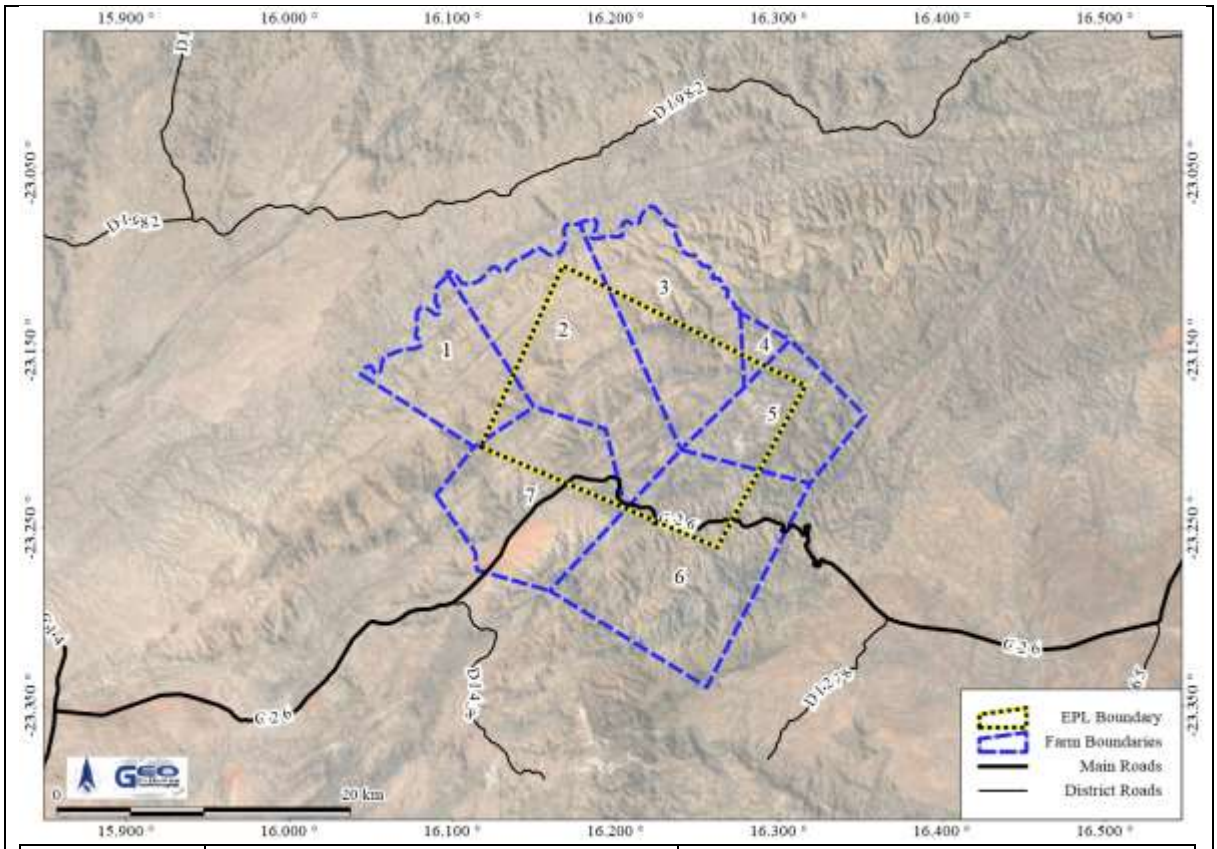


Figure 8-1 Location of EPL in context to the Khomas Region



Number on Map	Farm Name	Farm No
1	BONNA	FMM/00230
2	CHAIBIS	FMM/00926
3	TANTUS	FMM/00030
4	OTSUS	FMM/00051
5	NATAS	FMM/00220
6	DJAB	FMM/00026
7	KOS	FMM/00028/00REM

Figure 8-2 Farms overlapping with the EPL

Photo 8-1 **Turnoff to farms Natas and Tantus from the C26**

Photo 8-2 **View towards farm Otsus from farm Tantus**

Photo 8-3 **Djab River on farm Djab**

Photo 8-4 **Entrance to farms Kos and Chaibis from the C26 Main Road**

Implications and Impacts

The mine overlaps privately and government owned farmland. This necessitates surface access agreements to be reached between the Proponent and the owners of the land.

8.2 CLIMATE

A general lack of weather stations in Namibia, especially in rural areas, is problematic when attempting to get accurate climate data and descriptions for specific locations. Most of the weather stations that were operational in the mid to late 1900's have been closed. Climate descriptions are thus based on old measured data, crudely extrapolated for Namibia, and modelled data from satellite imagery. The following is thus a general description of the expected climatic conditions in the EPL area. Geographical features such as hills, river courses, low and high laying areas can significantly influence localised weather and especially temperatures. Data was extracted from the 2022 Atlas of Namibia unless otherwise specified (Atlas of Namibia Team, 2022).

According to the Köppen-Geiger Climate Classification system the EPL area is located in a hot desert climate (BWh) (http://koeppen-geiger.vu-wien.ac.at/present.htm). These are areas with very low annual precipitation, high temperatures, and significant diurnal temperature variations. These regions experience extreme aridity and are typically found in subtropical deserts.

Atlas of Namibia data indicates the average rainfall range from as low as 150 mm/a in the west to about 250 mm/a in the east of the EPL. Variation in annual rainfall is between 50 and 60% which means rainfall is unpredictable. Monthly rainfall usually peaks in January, February and March, with on average between 130 and 160 mm of the total rainfall occurring in these three months. A comparison of this data can be made with long term precipitation data obtained from the CHIRPS-2 database (Funk et al., 2015). The CHIRPS-2 dataset (Climate Hazards Group Infra-Red Precipitation with Station data version 2) consist of long term rainfall data (1981 to near-

present) obtained from satellite imagery and in-situ station data and therefore represents more recent data. Data is averaged over an area of roughly 5 km by 5 km. This averaging effect should be kept in mind during data analyses as high rainfall from single thunder storm cells would be averaged out, thereby providing a reduced daily maximum rainfall value. Due to the size of the EPL area, precipitation data for seven 25 km^2 areas were used. The data was grouped into two. The one being the averages of five blocks (125 km^2) overlapping the central to western part of the EPL (Table 8-1) and the second, two blocks overlapping the eastern part of the EPL (Table 8-2). Statistics for the two blocks are very similar. The average annual precipitation for the two areas over the last 41 years were calculated as 183.96 mm/a and 181.53 mm/a respectively. While the western area's modelled rainfall corresponds well with the Atlas of Namibia data, the eastern area's modelled rainfall is lower than the 200 to 250 mm/a provided in the Atlas of Namibia. Similarly, the coefficient of variance of 41 to 42% is also lower than the Atlas' 50 to 60%.

Heavier precipitation (single day events) occur between January and February, with a single day average of 55.19 mm/125 km^2 in March (last 42 years data) being the highest total for the central to western area, and 47.25 mm/50 km^2 being the highest for the eastern area. Maximum precipitation received over a 3-day period are 59.43 mm and 60.8 mm for the tow areas respectively. This indicates that heavy rainfall over long periods is not a common occurrence. Figure 8-3 presents seasonal (July to June) total precipitation, centred on the average line for the last 41 years, with the daily total precipitation and the seasonal cumulative precipitation. It is clear that 9 out of the last 10 seasons received below average rainfall.

Potential evapotranspiration for the area is high at between 2,300 and 2,400 mm/a. By dividing the mean annual potential evapotranspiration into the mean annual precipitation, an aridity index of less than 0.1 over the largest portion of the EPL is obtained, which indicates the area to be arid.

Table 8-1 Rainfall statistics based on CHIRPS-2 data for the central to western area of the EPL (Funk et al., 2015)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (mm/m)	7.26	10.72	14.57	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (mm/m)	161.06	205.36	117.31	60.92	4.63	2.55	0.17	0.93	1.81	9.53	33.50	37.61
Average (mm/m)	43.39	53.13	43.74	17.53	0.39	0.20	0.01	0.05	0.31	2.00	8.22	12.52
Variability (%)	79.60	72.92	55.47	67.51	296.68	261.72	370.90	398.30	191.32	110.53	91.25	72.85
Daily Maximum (mm)	35.18	42.46	55.19	49.72	4.33	2.55	0.17	0.91	1.39	4.31	8.87	13.86
Average Rain Days	5.33	6.16	4.58	2.37	0.16	0.47	0.16	0.16	0.51	1.35	2.33	2.88
Season July - June average 183.96					Season coefficient of variation: 41.1				3 Day return period: 59.43			
Date range: 1981-Jan-01 to 2024-Jun-30							Lat: -23.225°S			Long: 16.175°E		

Table 8-2 Rainfall statistics based on CHIRPS-2 data for the eastern area of the EPL (Funk et al., 2015)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (mm/m)	8.02	10.44	14.25	6.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (mm/m)	162.07	208.90	117.61	60.80	3.41	2.67	0.09	1.07	1.53	10.21	33.08	34.27
Average (mm/m)	42.64	51.37	43.28	18.61	0.31	0.19	0.00	0.06	0.27	2.21	8.09	12.17
Variability (%)	79.38	76.55	55.48	63.76	265.35	259.91	386.87	395.21	187.54	111.77	87.65	69.82
Daily Maximum (mm)	37.46	45.61	36.86	47.25	3.41	2.67	0.09	1.06	1.18	4.98	9.51	14.25
Average Rain Days	6.05	6.65	5.37	3.23	0.21	0.49	0.09	0.16	0.56	1.53	2.93	3.21
Season July - June average 181.53					Season coefficient of variation: 42.02				3 Day return period: 60.8			
Date range: 1981-Jan-01 to 2024-Jun-30							Lat: -23.225°S			Long: 16.225°E		

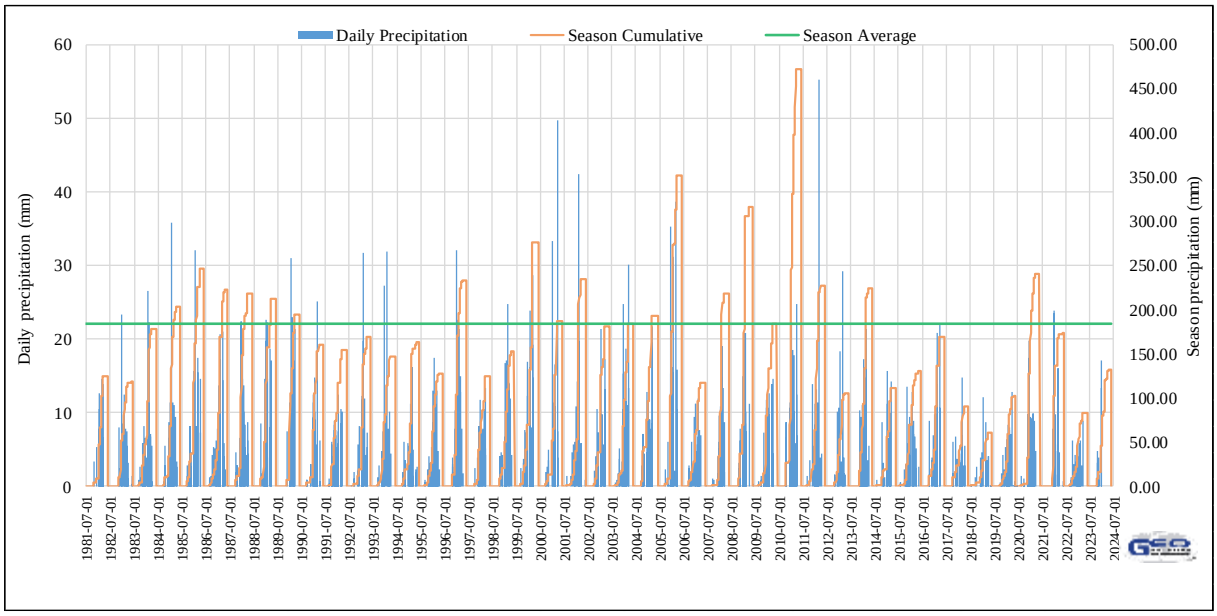


Figure 8-3 Daily and seasonal rainfall from CHIRPS-2 data (Funk et al., 2015)

Similar to precipitation data, temperature data is also lacking for the project area, with the Atlas of Namibia presenting only crude, large scale averages. To have an idea of temperatures in the area, monthly temperature data was retrieved from the Modern-Era Retrospective analysis for Research and Applications version 2 (MERRA-2) data set for a height of 2 m above surface (Ronald Gelaro, et al., 2017). This data set is a NASA atmospheric reanalysis, incorporating satellite data integration and aims at historical climate analyses at 0.5° x 0.625° spatial resolution. This translates to roughly 3,640 km², which still is a large area, but is somewhat less crude than the Atlas data. Table 8-3 presents statistics of daily data abstracted from the MERRA-2 data set for the last 40 years.

The lowest temperature of -1.89 °C was recorded in July, with, on average, very few days in the year being below freezing point. The average annual minimum temperature is 3.1 °C. A maximum temperature of 41.2 °C was measured in February, while the average annual maximum temperature is very high at 36.4 °C. The average annual temperature range is 20.8 °C, while the average diurnal temperature (difference between daily minimum and maximum temperature) for this area is around 26 °C. Direct normal solar irradiance for the area is 7.911 kWh/m²/day. Electricity generation with photovoltaic installations will thus be efficient in the area.

Table 8-3 Temperature statistics based on Merra-2 data (Ronald Gelaro, et al., 2017)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Minimum (°C)	6.64	9.35	7.26	3.11	0.23	-1.39	-1.89	-1.00	-0.97	2.17	5.57	7.59
Maximum (°C)	39.78	41.19	39.14	35.83	32.20	29.32	30.03	33.21	37.35	38.85	39.57	40.03
Average (°C)	25.62	25.09	23.78	20.66	18.03	15.03	14.62	16.46	19.84	22.07	23.70	24.75
Diurnal (°C)	24.74	23.55	23.46	23.82	23.82	24.02	25.02	27.81	29.37	28.82	27.44	26.19
Season July - June				Seasonal average Temperature: 20.8								
Date range:		1980-Jan-01		to	2020-Sep-29			Lat: -23.000°S			Long: 17.500°E	

Figure 8-4 indicates modelled wind data that has been generated using satellite data. Localised conditions may see wind patterns being altered by localised topography, especially given the varying topography and presence of the escarpment to the east. Strong to very strong winds are more frequent from the east-southeast, east and the west. Less frequent, lower velocity winds are from the north and south. Higher up on the escarpment, the frequency of winds from the north to northeast are expected to increase somewhat.

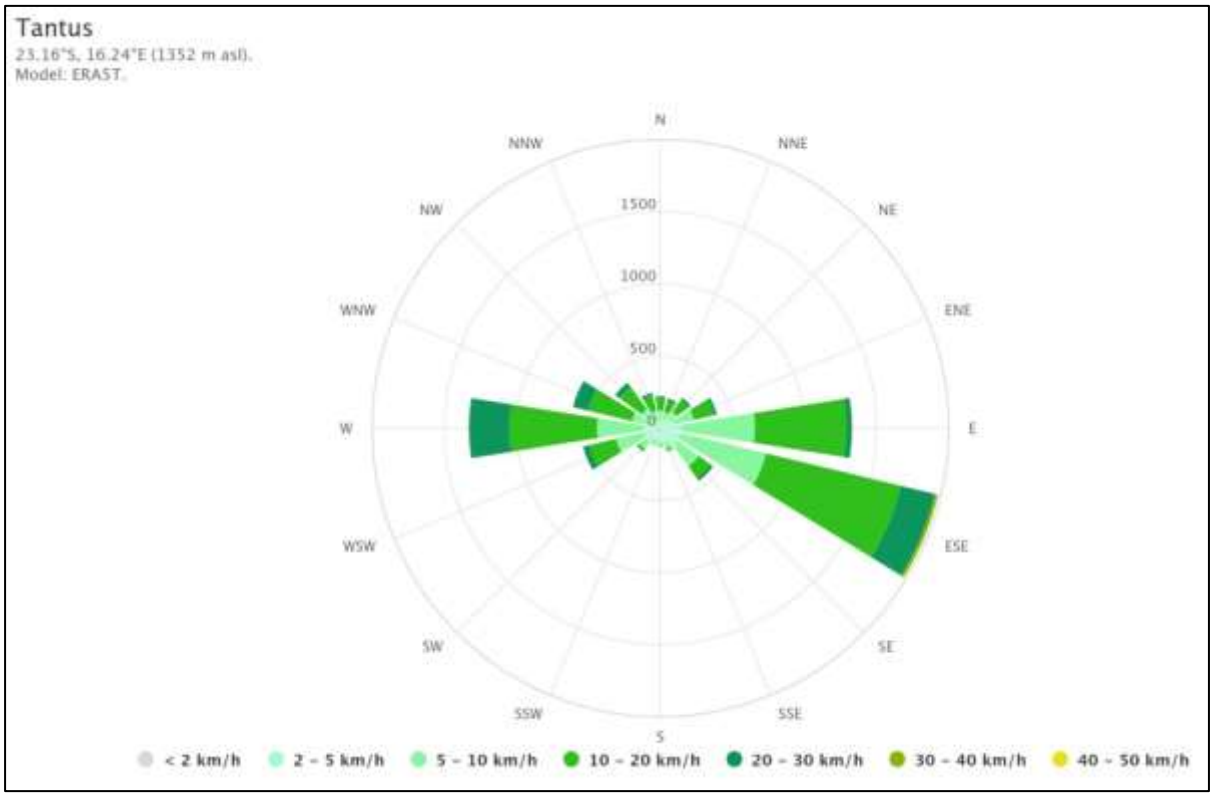


Figure 8-4 Average wind speed and direction (https://www.meteoblue.com)

Implications and Impacts

Rainfall events are often thunderstorms with heavy rainfall that can occur in short periods of time (cloud bursts). High intensity and erratic rainfall events may result in flash floods along the river courses and specifically also the Djab and Obos Rivers. Rainfall may result in the leaching of pollutants or hazardous substances into groundwater. Frequent high temperatures experienced in the area poses a risks to employees who can become dehydrated or get sunstroke. Sunburn is also a high risk as the solar radiation levels are high. Wind may carry dust and noise to nearby receptors. This includes possible dust impacts affecting the night sky's clarity, which in turn may impact the quality of stargazing and astronomy at nearby observatories.

8.3 TOPOGRAPHY AND DRAINAGE

The EPL is situated at the confluence of three demarcated landscapes, the Khomas Hochland Plateau, Central-western Plains and the Rehoboth Highlands (Figure 8-5). The majority of the EPL is located within Southern Escarpment of the Khomas Hochland Plateau Landscape, with the northern corner overlapping the Central-western Plains landscape. The Rehoboth Highlands is about 6 km south of the southern corner of the EPL. The Khomas Hochland Plateau consists rolling hills and deep valleys, the weathering product of a mountain chain that formed as a result of the collision of continents. This landscape can be rugged at places and is the source of the Kuiseb River draining to the Atlantic Ocean. Being located on the western edge of the Khomas Hochland Plateau, almost the entire EPL is within the Southern Escarpment. In the EPL area, the escarpment separates the lower lying Central-Western Plain form the highlands of the Khomas Hochland.

Ground surface elevation range from just over 1,100 mamsl in the west to more than 1,500 mamsl in the east of the EPL (Figure 8-6). This results in spectacularly rugged terrain (Figure 8-7) and the Gamsberg Pass, with a gradient of 1:9, linking the lower lying areas of the EPL with Windhoek, via the C26 Main Road.

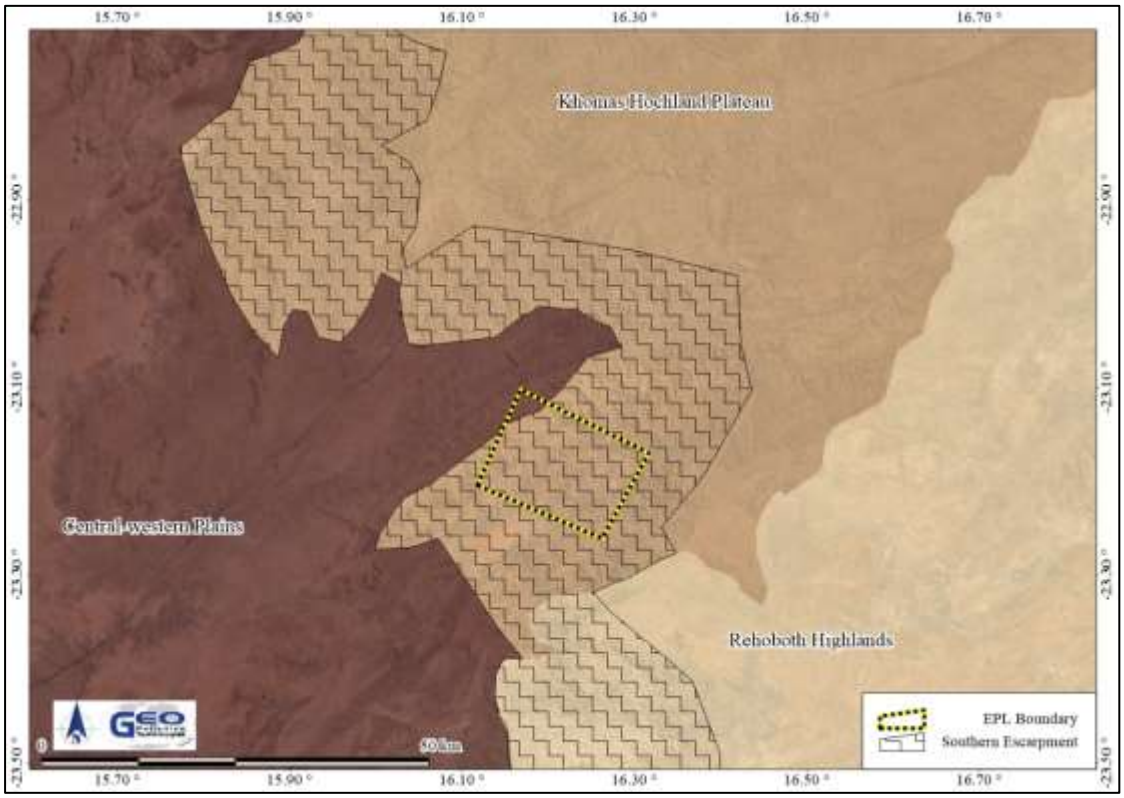


Figure 8-5 Landscapes overlapped by the EPL

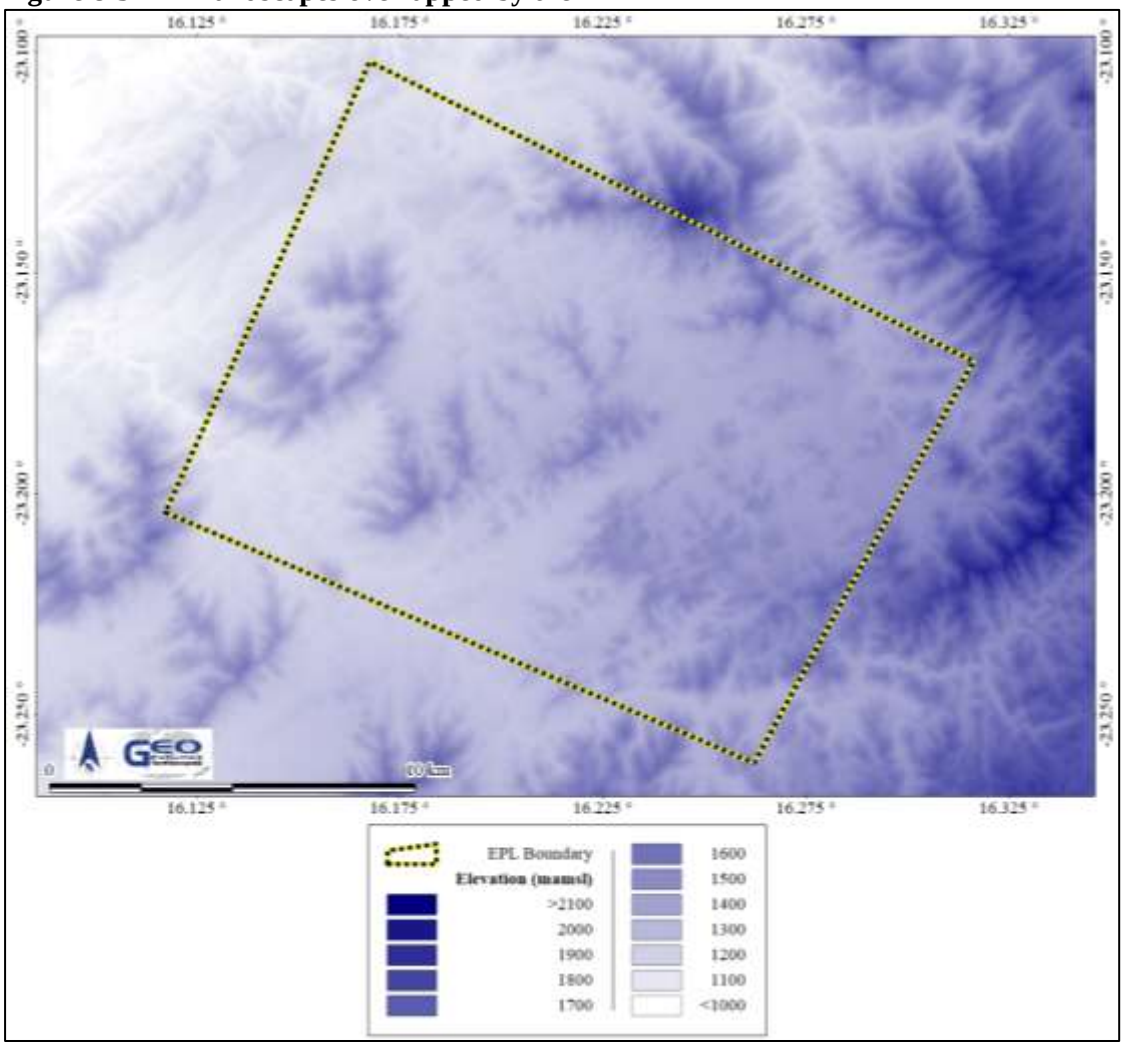


Figure 8-6 Elevation changes within the EPL

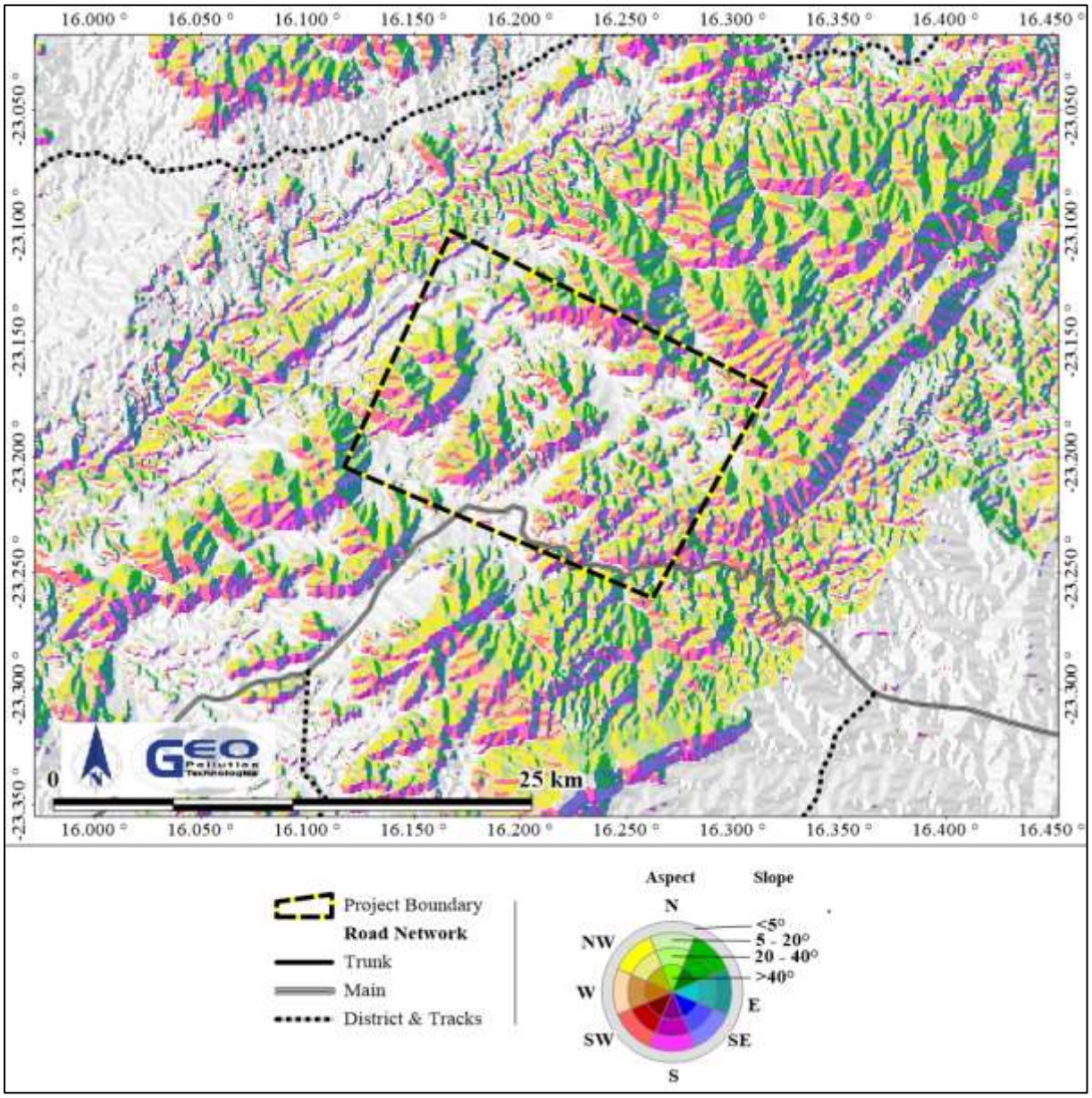


Figure 8-7 Slope-aspect map

The main surface drainage features are the Djab and Obos Rivers which originates in the steep slopes of the escarpment. Due to the mountainous terrain and steep elevation changes, surface drainage is very well developed. The Obos River joins up with the Djab River, just outside of the western boundary of the EPL (Figure 8-8). The Djab River then flows into the Kuiseb River about 9 km west of the EPL.

Implications and Impacts

Access to exploration areas will be difficult due to the rugged and mountainous terrain, where no existing roads are present. Even moving of large vehicles such as drill rigs to the EPL area will require cognisance of the steep Gamsberg Pass.

If new roads are created to gain access to particular areas of the EPL, or if drill pads are cleared, erosion can occur during heavy rainfall events. If such roads and drill pads are not suitably rehabilitated, erosion may be a long term problem.

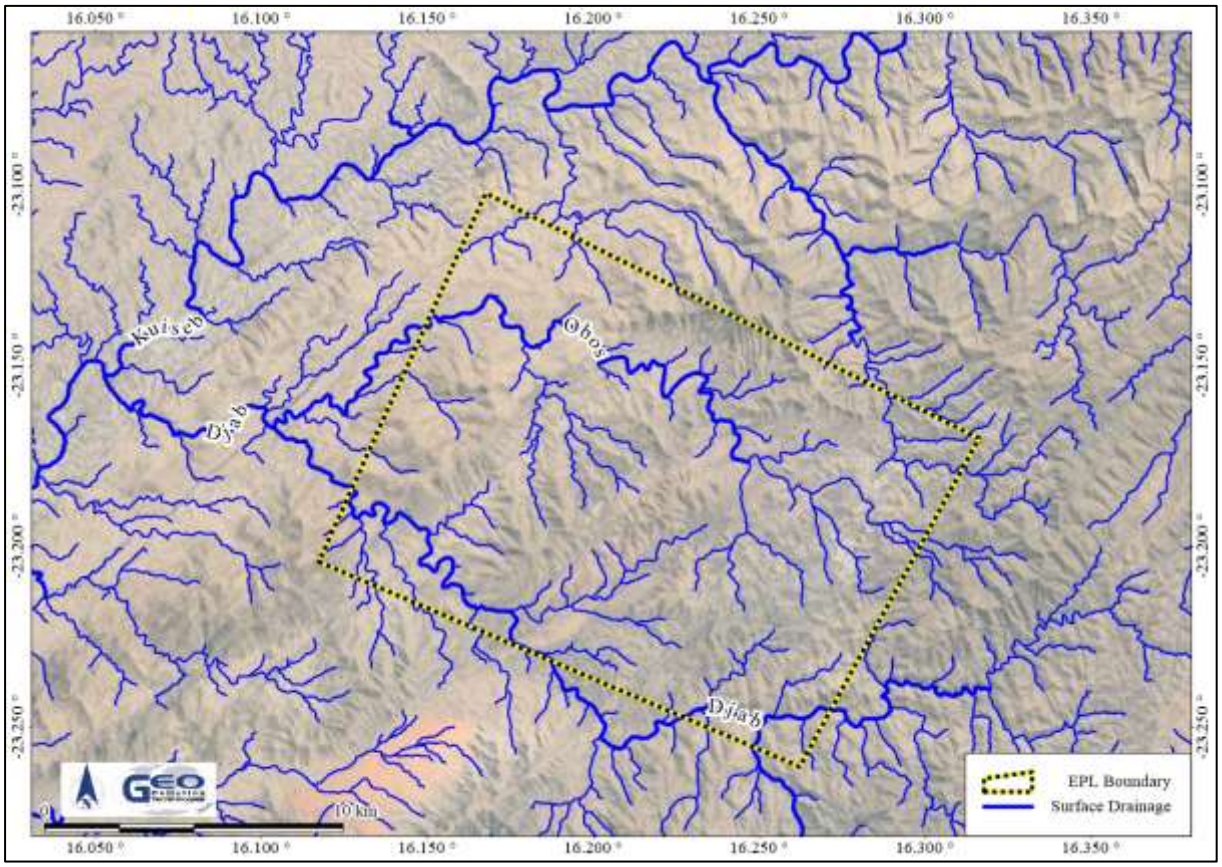


Figure 8-8 Surface drainage in the EPL area

8.4 SOILS AND ROCK TYPES

The dominant soil type for this area is Lithic Leptosol. This is soil typically with a stony characteristic, or very shallow depth, over a continuous rock surface. It is typically found in hills where erosion takes place at a higher rate than soil formation or sediment deposition. The composition of soil in the EPL area is sandy loam to loam soils. While loam soil are typically excellent for crop cultivation, the stony characteristic, and the fact that the leptosol are typically a thin layer with high drainage, soil in the EPL area is a poor candidates for crop production.

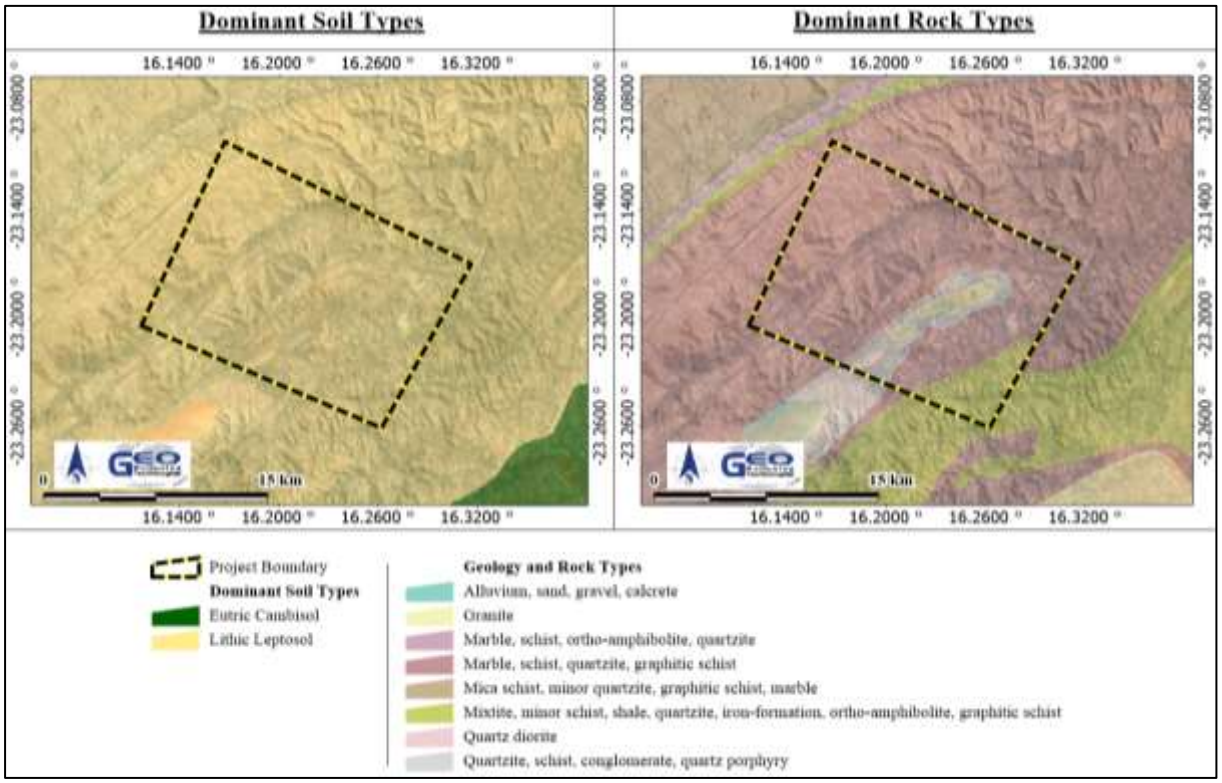


Figure 8-9 Soils and rock types

8.5 GEOLOGY AND HYDROGEOLOGY

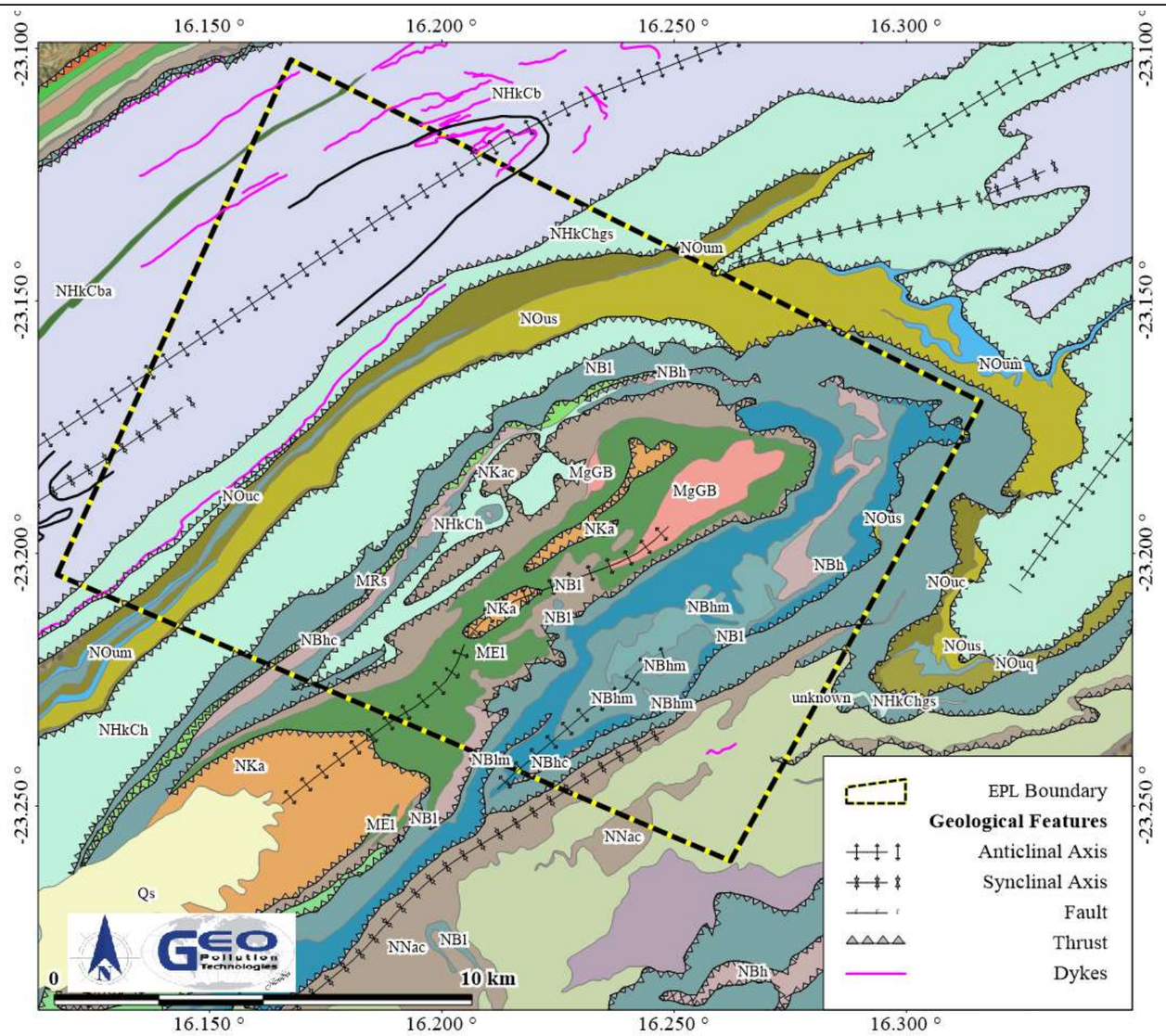
The geology underlying the project area formed during the Namibian (N) and Mokolian (Mho) age groups and is associated with the Southern Margin Zone (SMZ) of the Damara Orogen (Namibian Age). Locally the Damara Orogen represents an alpinotype fold, thrust and compression belt where metamorphic gneisses were tectonically stacked onto Meso- to Palaeozoic basement granites. This tectonic event occurred during the collision of the Kalahari Carton with the Congo Craton.

Three stages of deformation have been identified which are attributed to regional change in transport direction and tectonic style (Becker, 2016). D1 represents a shallow-dipping Barrovian-type metamorphism. D2 is identified as a drastic change in transport direction towards the southeast where large-scale folds evolved together with shallow northwest dipping thrusts. D3 exhibits an east - west compression with localized strike slip cleavage and gentle folding around a north - south trending axis, resulting in dome and basin interference structures.

The largest part of the project area is underlain by the Kudis Subgroup of the Swakop Group. The Kudis Subgroup includes metamorphic Neoproterozoic rocks like carbonate rocks, graphite schist, basalts and quartzite.

The autochthonous to parautochthonous pre-Damara Basement is exposed as volcaniclastic rocks of the Elim Formation (MEl). Intrusive rocks emplaced into these formations are gneissic gabbro, tonalite and hornblende bearing granodiorite (MgGB).

Numerous fault-propagation folds and thrust zones are present at the project location. Most of these are associated with the tectonic collision of the Kalahari Carton with the Congo Craton. Some mineralization and even fountains in the region are associated with these tectonic zones. The southwest - northeast trending Matchless Amphibolite Member is an example of such a mineralized zone (approximately 12 km to the northwest of the project area). Geochemically the Matchless Amphibolite Member (also known as the Matchless Belt) portrays a typical mid-ocean ridge basalts composition, also known as MORB. The Matchless Belt comprising mainly of amphibolites, chlorite schists and metagabbro with multiple copper-gold deposits sheet-like ore bodies of massive sulphides. The Matchless - and Otjihase Mines are examples of mainly copper mining activities related to the Matchless Belt.



Lithcode	AGE	Sequence	GROUP	SUBGROUP	FORMATION	MEMBER	MAIN_LITHO	OTHER_ROCK
Qs	Quaternary						sand; gravel; scree; calcrete	
NGrHl	Namibian	Damara	Hakos	Vaalgras	Gomab River	Hartelus	felsite	
NGr							mica schist; chlorite-amphibole-carbonate schist	metafelsite; marble
NHa					Haris		mica schist	schist (calcareous); marble (micaceous); quartzite; amphibolite
NMh					Mahonda		quartzite (micaceous); mica schist	quartzite
NMr					Melrose		mica schist; garnet-muscovite schist	quartzite (calcareous); schist (calcareous)
NSms					Samara		chlorite-muscovite schist; mica schist (calcareous)	marble; quartzite
NSmm							dolostone (massive); marble (calcitic)	quartzite (calcareous); schist
NNas					Naos		schist	
NNaq							quartzite	
NNaa							amphibolite	
NNac							conglomerate	
NBl				Kudis	Blaukranz		schist (graphitic)	schist (calcareous)
NBlm							marble	
NOus					Otsus		quartz-biotite schist	
NOuc							conglomerate (calcareous)	calc-arenite
NOum							marble (dolomitic)	
NOuq							quartzite	schist (graphitic)
NHkChgs					Hakosberg	Chausib	schist (graphitic)	meta-arenite; amphibolite
NHkCh							quartzite (micaceous); schist (graphitic)	
NHkChpt							quartz-biotite schist (graphitic)	psammite; greywacke
NHkCb						Chaibis	quartzite	schist (graphitic); mica schist
NHkCba							amphibolite	
NBh					Berghof		diamictite; conglomerate	phyllite
NBhc							conglomerate/diamictite (polymict)	
NBhm							marble (dolomitic)	
NKac			Nosib		Kamtsas		conglomerate	
NKa							quartzite (feldspathic/pebbly)	shale; conglomerate
MgGB	Namaquan						granite gneiss; granite (coarse-grained; locally porphyritic)	granite porphyry
MgHp							granite gneiss (porphyritic); biotite granite (gneissic)	granite (aplitic)
MEl	Kheisian		Rehoboth		Elim		metavolcanic rocks (mafic)	quartzite; mica schist; phyllite; metalava (felsic)
MRs					Rostock		quartz-mica schist	schist (pebbly); amphibolite; schist (quartz-feldspar bearing); quartzite; quartzite (ferruginous)

Figure 8-10 Geology

Groundwater flow is expected to take place through primary porosity in the surface cover, while it is expected to flow along fractures, faults, dykes/mineralised faults or along contact zones (secondary porosity) and other geological structures present within the underlying formations (hard rock formations).

Borehole data from the Ministry of Agriculture, Water and Land Reform (MAWLR) was utilised to present information on the local groundwater characteristics. The groundwater statistics were compiled for a 2 km radius around the project area. Note that some data may not be available for relevant boreholes and that the database is generally outdated. More boreholes might be present.

Statistical grouping of parameters is for ease of interpretation, except for the grouping used for sulphate, nitrate and fluoride, which follow the Namibian guidelines for the evaluation of drinking-water quality for human consumption, with regard to chemical, physical and bacteriological quality. Group A indicate groundwater with excellent quality, Group B groundwater with acceptable quality, Group C groundwater with low health risk and Group D indicating groundwater with a high health risk, or water unsuitable for human consumption.

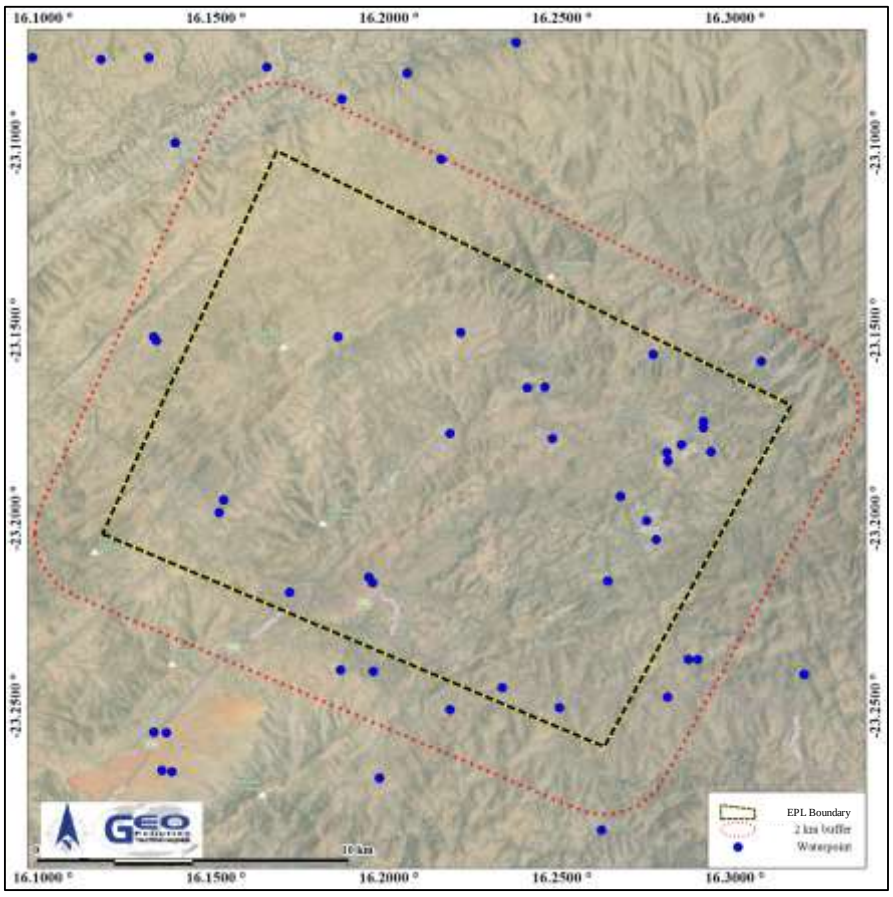
According to the MAWLR borehole database, there are 34 boreholes within an area covered by the project area and a further 2 km buffer around the project area. The average water level of the groundwater is 38.42 mbs. The total dissolved solids (TDS) is evenly spread over all four water quality groups. Sulphate concentrations are mainly Groups A and B, with only 33% of values in the Groups C and D category. For Nitrate 67% is in Groups A and B, while fluoride concentrations are all in Group A. See Table 8-4 and Figure 8-11 for the groundwater statistics and quality.

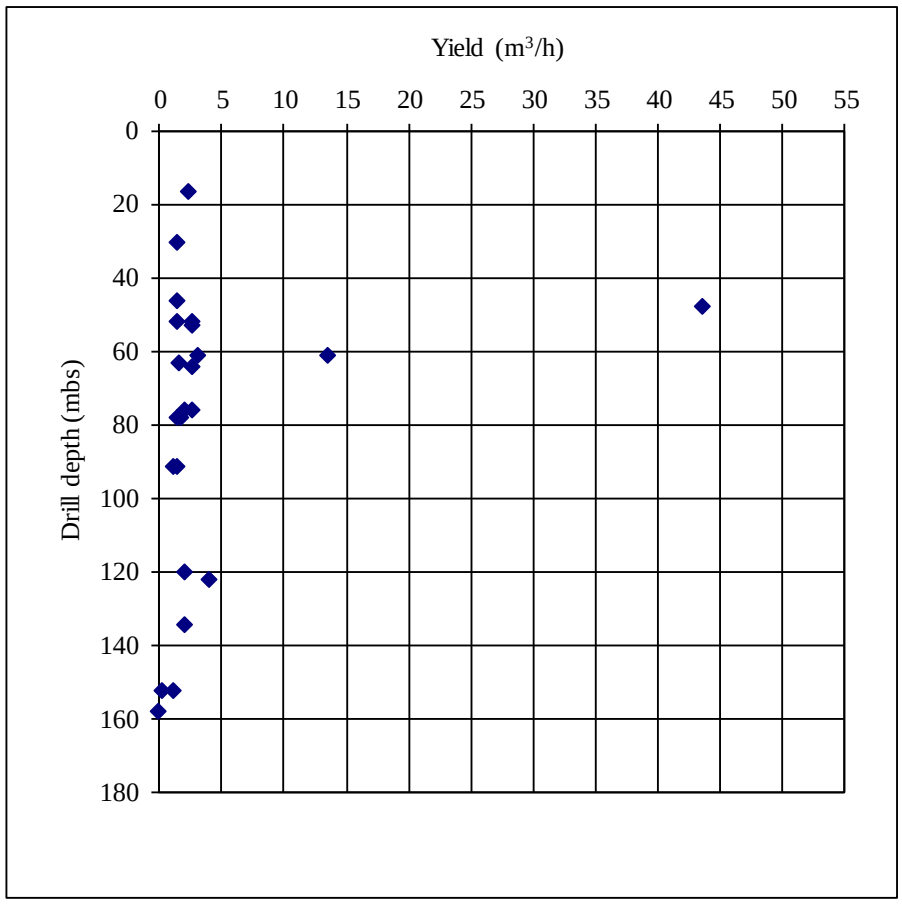
Based on the available data points it is hypothesised that there is not a correlation between water quality and boreholes depth. This would suggested that water quality is more a function of the geology intersected, than the depth of the borehole.

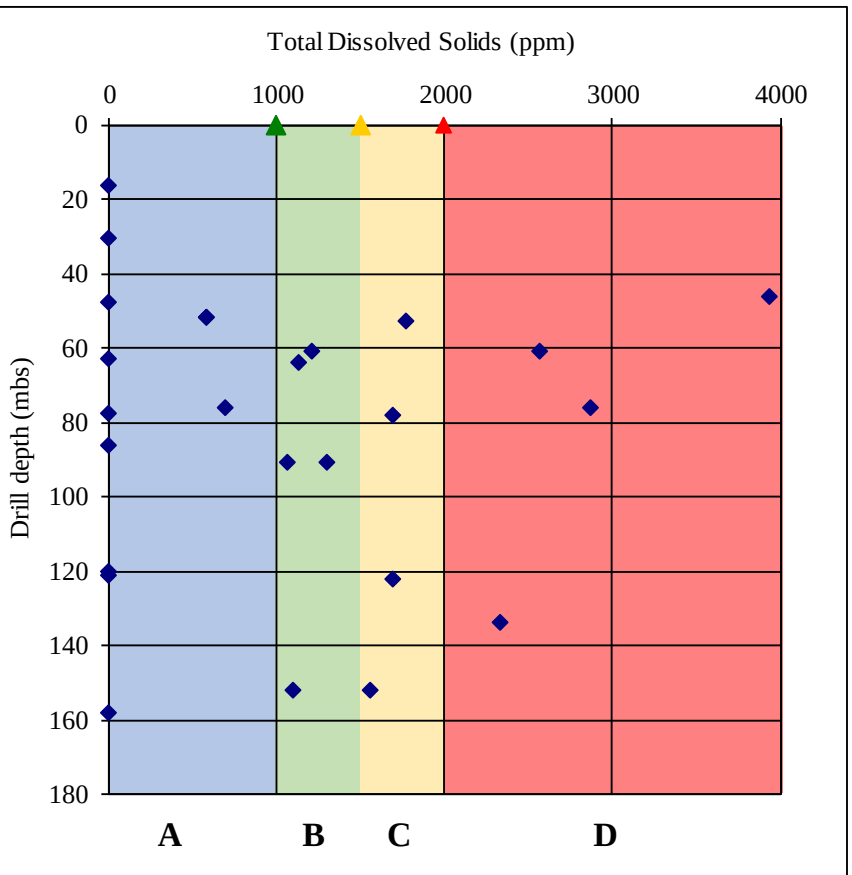
Several springs have been recorded in the region, especially on the contact between the Kudis Subgroup and the Chuos Formations to the north of the project area.

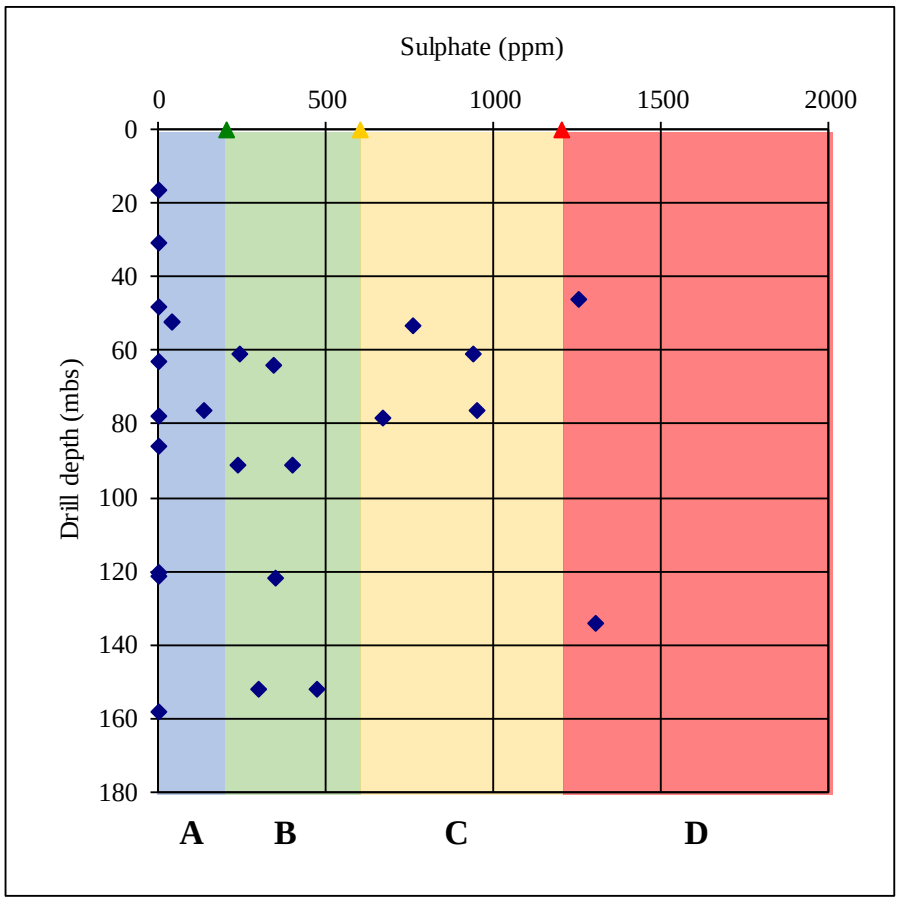
Table 8-4 Groundwater statistics

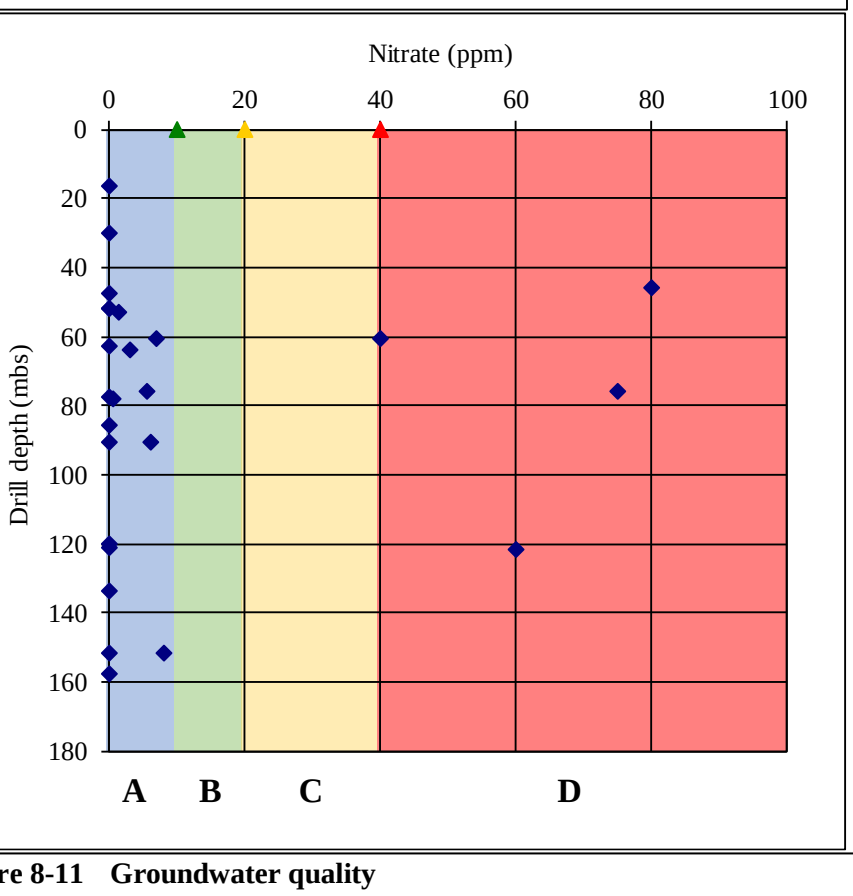
Area of Interest:	Project Area and Buffer					Query Buffer: 2 km		
	Number of Known Boreholes	DEPTH (mbs)	YIELD (m³/h)	WATER LEVEL (mbs)	TDS (ppm)	SULPHATE (ppm)	NITRATE (ppm)	FLUORIDE (ppm)
Data points	**34**	25	31	22	21	21	15	21
Minimum		16.50	0.30	2.40	577.00	40.00	0.50	0.20
Average		83.28	4.69	38.42	1,616.14	495.10	26.90	0.53
Maximum		158.00	43.60	300.00	3,933.00	1,300.00	85.00	0.90
Group A		16.00%	6.45%	18.18%	23.81%	23.81%	53.33%	100.00%
Limit		50	>10	10	1000	200	10	1.5
Group B		56.00%	6.45%	68.18%	28.57%	42.86%	13.33%	0.00%
Limit		100	>5	50	1500	600	20	2.0
Group C		28.00%	61.29%	4.55%	23.81%	19.05%	0.00%	0.00%
Limit		200	>0.5	100	2000	1200	40	3.0
Group D		0.00%	25.81%	9.09%	23.81%	14.29%	33.33%	0.00%
Limit		>200	<0.5	>100	>2000	>1200	>40	>3











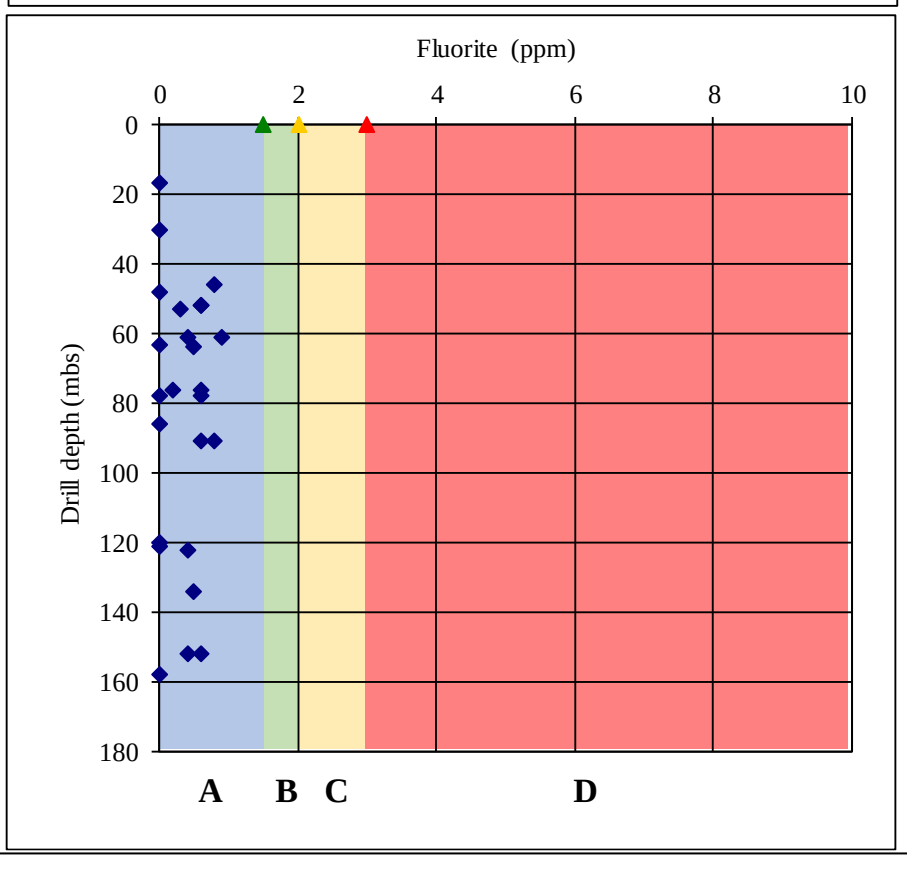


Figure 8-11 Groundwater quality

Implications and Impacts

Should exploration reach the exploratory drilling stage, multiple boreholes may be drilled in selected areas. Multiple boreholes in an area without water abstraction, typically has minimal direct impact on groundwater levels or aquifer depletion. However, the drilling process can locally disturb the subsurface (the aquifer material), and depending on the local geology, potentially alter groundwater flow pathways or hydraulic properties. Poorly constructed or uncapped boreholes may also increase the risk of contamination, allowing surface pollutants or water from different aquifers to mix, which can degrade water quality.

8.6 PUBLIC WATER SUPPLY

Water supply on all farms intersected by the EPL is from boreholes. It was confirmed by the landowners that groundwater is a very scarce resource, worsened by the current drought conditions. Various earth dams have also been constructed to collect and store rainwater in the EPL area. It mainly serves to provide a surface water resource to livestock and wildlife, but also aids in replenishing groundwater.

Implications and Impacts

Public water supply may be impacted if groundwater contamination or over abstraction takes place.

8.7 ECOLOGY

8.7.1 Vegetation

This EPL is located in the Tree and Shrub Savanna biome and has a Western Highlands vegetation type (Figure 8-12). A very small part of the EPL's eastern side is within the Highland 1,500 m floristic group, where taxa occurring above 1,500 mamsl occur.

Due to the heterogeneous terrain, vegetation varies according to topographical features and surface geology and soils. According to the 2022 Atlas of Namibia, 30 species of plants, of which five are endemic and none are locally endemic, have been recorded in the quarter degree square (QDS) 2316AA, overlapping almost the entire EPL. This is however in all likelihood a significant underrepresentation of vegetation diversity, as the surrounding QDS' have significantly more species as well as higher endemicity (Figure 8-13). For example, the QDS to the southeast, which overlaps Gamsberg, is recorded as having 270 species of which 41 are endemics and 3 local endemics. This type of data discrepancies are common in Namibian datasets, as rural or remote areas, with no specific lure, are often not well surveyed. It is thus safe to say that the EPL will contain at least about 130 species, but most likely more given the heterogeneous terrain and the nearby areas with known higher plant diversity.

The Tree Atlas of Namibia lists 61 tree species as occurring in QDS 2316AA and 2316AB (Curtis & Mannheimer, 2005). These are presented in Appendix A. Of the trees, fourteen are listed as being protected in Namibia, while four are listed in CITES Appendix II. Species listed in Appendix II are not necessarily currently threatened with extinction, but may be in future unless trade in these species is closely controlled. Four species are considered as indigenous invasive species in Namibia and one genus, *Prosopis*, is an alien. Although *Prosopis* is not listed as invasive, it can be along river courses such as for example the Auob River between Stampriet and Gochas in the Hardap Region.

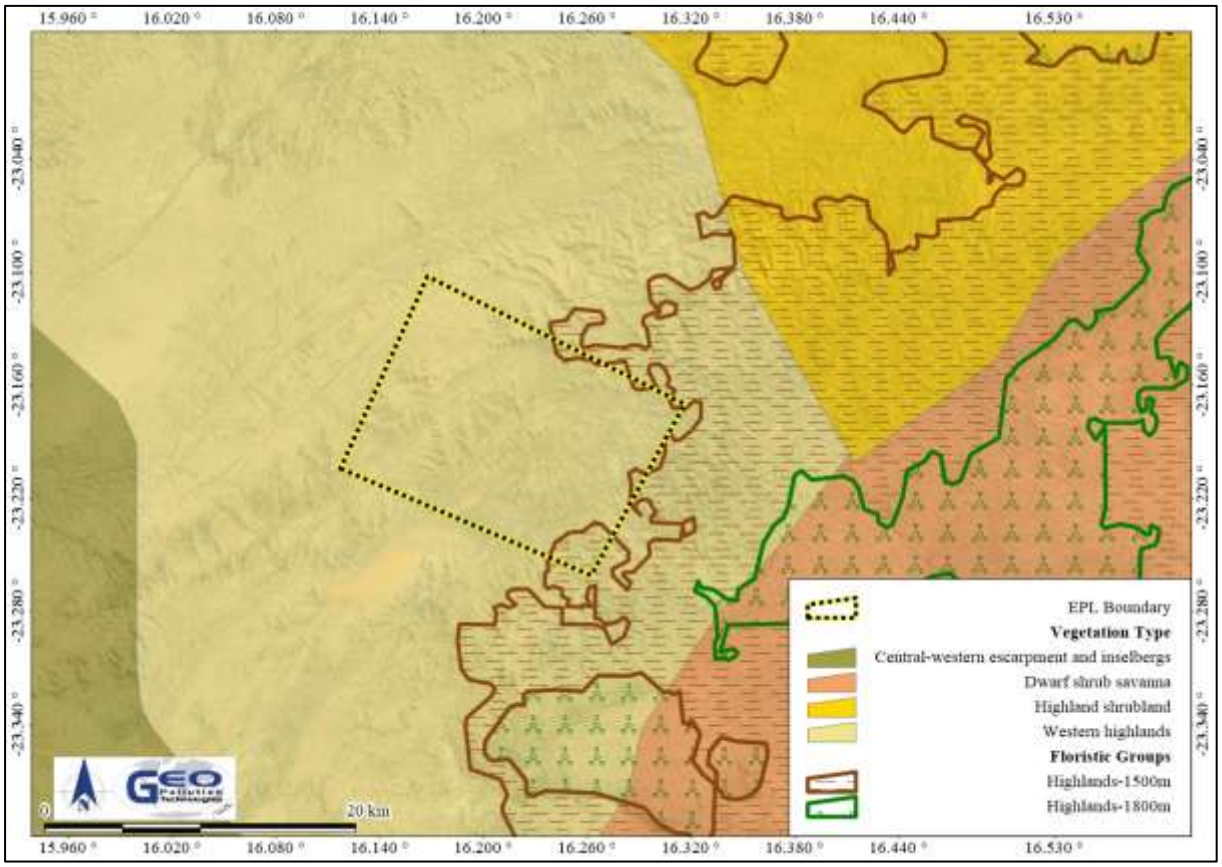


Figure 8-12 Vegetation type and floristic group

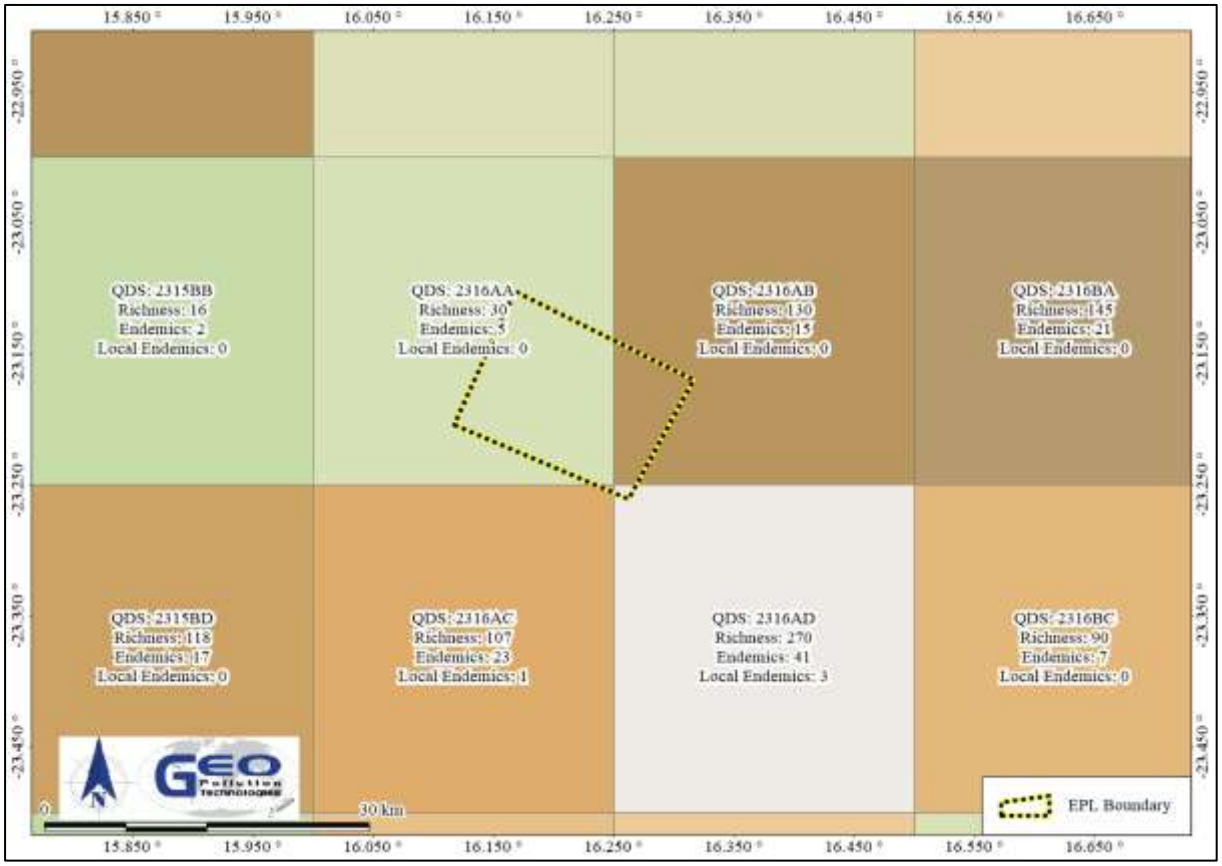


Figure 8-13 Plant species richness and endemics in the area

During the site visit it was at the beginning of the rainy season and no rain was received yet. The area, as with many parts of Namibia, was extremely dry as a result of the ongoing drought conditions and now new growth or blooming of trees were observed outside of river beds. It was noted that corkwoods (*Commiphora* species) are abundant in the more mountainous areas of the EPL (Photo 8-5). Similarly, the resurrection bush (*Myrothamnus flabellifolius*) also occurs in relatively dense stands on the mountain slopes (Photo 8-6). The resurrection bush, or tea bush as it is also known, is known for being almost completely desiccated during the dry winter months, but then rapidly turns green after it receives rain. It is also popular for its medicinal and cosmetic uses. The near endemic and Namibian protected moringa, or phantom tree, *(Moringa ovalifolia*) occur within the EPL, although it is not very abundant (Photo 8-5). Other interesting or important plants and trees noted in the EPL during the site visit include the Namibian protected and / or CITES Appendix II plants: quiver tree (*Aloe dichotoma*), bitter ghaap (*Hoodia gordonii*), Windhoek aloe (*Aloe littoralis*) and the very poisonous Candelabra euphorbia (*Euphorbia virosa*) (Photo 8-7 to Photo 8-10). Camel thorn (*Acacia erioloba*), Shepherd's tree (*Boscia albitrunca*), wild ebony (*Euclea pseudebenus*) and yellow-bark Acacia (*Acacia erubescens*) were also among the trees observed in the EPL (Photo 8-11 to Photo 8-14). A few isolated alien Prosopis trees were observed along river beds or associated with old cattle posts.

Photo 8-5 Various corkwoods with a moringa tree

Photo 8-6 Stand of resurrection bush

Photo 8-7 Quiver tree

Photo 8-8 Bitter ghaap

Photo 8-9 Windhoek aloe

Photo 8-10 Candelabra euphorbia

Photo 8-11 Camel thorn

Photo 8-12 Shepherd's tree

Photo 8-13 Wild ebony

Photo 8-14 Yellow-bark Acacia

8.7.2 Wildlife

The EPL overlaps farmland traditionally used for livestock farming only. The shortage of water and dry climate limits the number of livestock that can be kept, as well as prevent other agricultural activities that relies on water. As such, tourism and professional hunting have over the last few decades been adopted on some farms in the general area to supplement income.

As such, game management and protection are important to land owners. Based on the Atlas of Namibia, between 61 and 75 species of mammal occur in the area. Despite the dry conditions a number of mammals were observed during the site visit. These include kudu (*Tragelaphus strepsiceros*), oryx (*Oryx gazella*), springbok (*Antidorcas marsupialis*), steenbok (*Raphicerus campestris*) and chacma baboon (*Papio ursinus*) (Photo 8-21 to Photo 8-19). Other mammals that will occur in the area include mountain zebra (*Equus zebra*), plains zebra (*Equus quagga*), leopard (*Panthera pardus*), cheetah (*Acinonyx jubatus*), spotted hyena (*Crocuta crocuta*), brown hyena (*Hyaena brunnea*), bat-eared fox (*Otocyon megalotis*), klipspringer (*Oreotragus oreotragus*) and a variety of rodents, lizards, snakes, birds, etc. A black eagle (*Ictinaetus malaiensis*) was seen flying over the EPL area (Photo 8-20).

Photo 8-15 Kudu

Photo 8-16 Oryx

Photo 8-17 Springbok

Photo 8-18 Steenbok

Photo 8-19 Chacma baboon

Photo 8-20 Black eagle

Implications and Impacts

A significant portion of Namibia's protected tree and plant species occur within the EPL boundaries. These, together with bird nests they (and other trees) may contain, may be damaged during exploration activities. Poaching of wildlife is a concern. Encounters with venomous (mambas, puff adders, zebra snakes, scorpions) or dangerous animals (e.g. leopard, rabid animals, etc.) may pose a danger to the Proponent's staff.

8.8 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS

The project is located in the western area of the Windhoek District and Khomas Region, and falls under the Windhoek Rural Constituency. Based on the preliminary results of the 2023 census, the Region has a population of 494,605 and the constituency is 30,079 of which 16,452 are male and 13,627 are female. The constituency has a density of 0.8 people/km² (National Planning Commission, 2023). Based on the older 2011 census data, the Khomas Rural Constituency's unemployment rate is 16% which is well below the regional average of 30%. Of the employed population, the majority are skilled agricultural workers.

Livelihoods on the farms within the EPL area and surrounds have traditionally mainly been reliant on livestock farming. Reliance on livestock farming has however decreased and many of the owners have now included (or replaced livestock farming) with hospitality and tourism services and / or trophy hunting. Farm Bonna is a resettlement farm where small-scale mining takes place.

The EPL is relatively remote from commercial centres with Windhoek reachable by 150 km and Walvis Bay by 200 km of gravel roads. Solitaire, 110 km away by road, has the nearest small shop, fuel retail facility with tyre repair service, and restaurant / take-away. Farms surrounding the EPL that has hospitality and accommodation facilities are, among others, Rooisand Desert Ranch on farm Chausib, Hakos Astro Guest Farm on Farm Groot Hakos, Corona Guest Farm on Farm Corona, Camp Isibas on Farm Isabis and Camp Rooiklip on Farm Rooiklip. Of these, both Rooisand Desert Ranch and Hakos Astro and Guest Farm have observatories. Stargazing is offered to guests and remotely operated observatories of international astronomers are located on Farm Chausib. It is specifically the dark and clear (unpolluted) night sky in this area presenting an ideal location for astronomy.

Implications and Impacts

There are no settlements in or near the EPL area. Thus, although unemployment and poverty in the Khomas Region is relatively high, there will be no job seekers in the area, apart from possibly some of the farmworkers' family members. Prospecting in the area may provide some economic benefits to the landowners in or around the EPL. This relates mainly to lodging that can be provided to the exploration teams. On the flipside, foreign people present on the farms, and the prospects of the eventual possibility of mining on the farms, causes anxiety among farm owners who are afraid of losing their livelihoods (e.g. livestock farming) and/or farms to mining companies. The presence of prospecting teams may result in an increase in social ills, deviant behaviour and criminal activities in the area. An increase in poaching may also occur, not necessarily instigated by the team members, but by criminals posing as members of the exploration team who operates in the area.

Light and air pollution or dust can have significant impacts on the quality of the night skies that presents excellent stargazing and astronomy conditions. Should this occur, it may result in international astronomers losing interest in this area as a suitable location for their observatories.

8.9 CULTURE, HERITAGE AND ARCHAEOLOGY

The general area where the EPL is situated is best known for the flat-topped Gamsberg Mountain. At 2,347 mamsl, it is the third highest mountain in Namibia. Origin of the mountain's name is not certain and the mountain had various version of the name on old maps, including Tansberg, Gansberg (from the Nama word "gan", meaning "flat on top"), Kansberg and Gr. Schanz Berg, and Gamsberg (lion mountain from the Nama word "xam" (De Jong 2021). Gamsberg and surrounds were part of an area where the Namas, Ovaherero and Germans had various battles dating back to the early 1900s (De Jong 2021).

The 2022 Atlas of Namibia (Atlas of Namibia Team, 2022) produced maps indicating the potential densities of archaeological sites in Namibia, by extrapolating the available data for all recorded archaeological sites. These maps were produced for archaeological sites dating back to the last 2,000 years (Figure 8-14), between 2,000 and 10,000 years ago (Figure 8-15), and 10,000 to 1.8 million years ago (Figure 8-16). Based on the extrapolated data, the EPL is located in an area where there could be a medium to high density of archaeological sites dating back to the last 2,000 years, a high density dating back to between 2,000 and 10,000 years ago, and a medium to low density dating back to later than 10,000 years ago. Based on the data provided in the 2022 Atlas of Namibia, no declared national heritage monuments or sites are present within or near the EPL (Figure 8-17). However, during the site visit, it was established that on farm Tantus there are rock paintings and an unmarked grave site present (Figure 8-18 and Photo 8-21 to Photo 8-24). Kinahan (2021) also indicated a recorded site of archaeological significance on farm Tantus (Figure 8-18). The nature of the site is however not known. None of the other landowners asked, indicated the presence of any such sites, nor any other objects or unmarked graves that may have heritage or archaeological significance, within the EPL area.

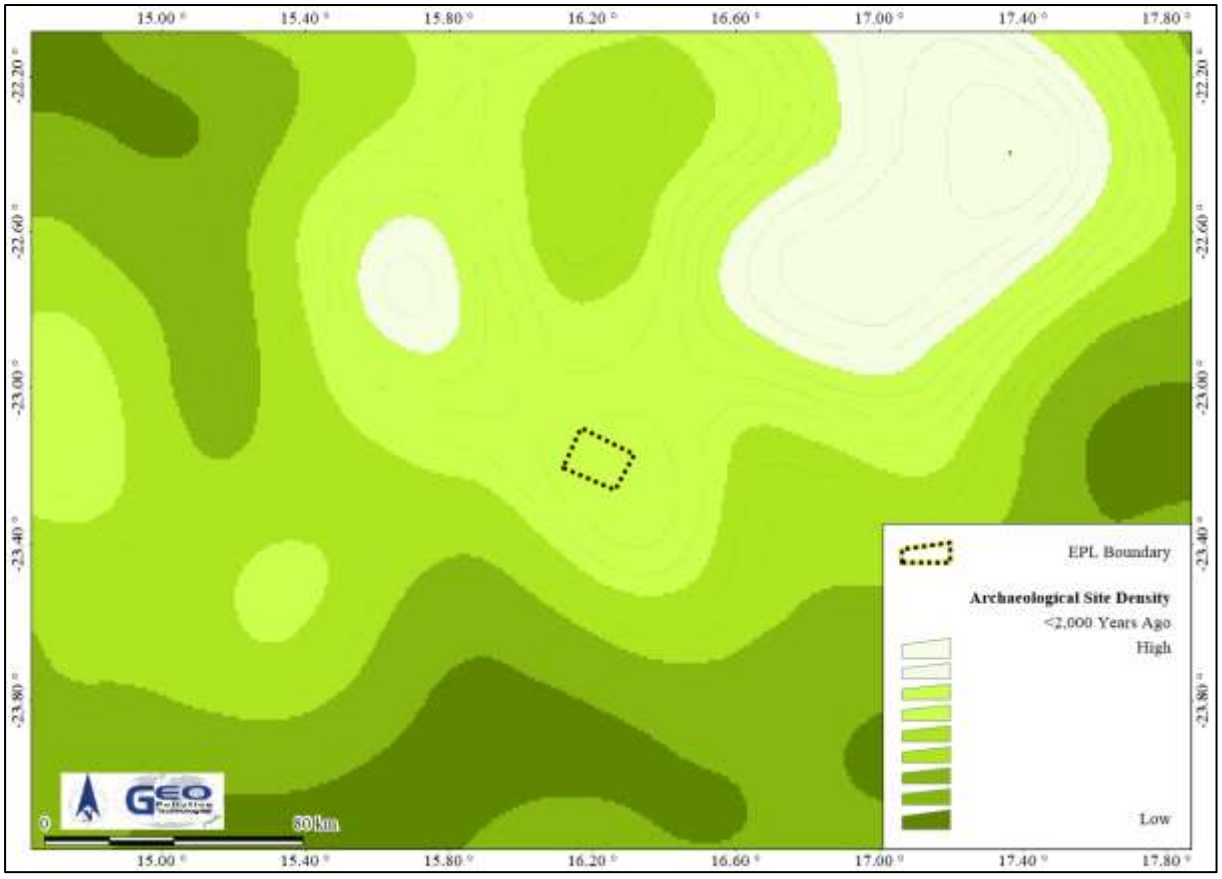


Figure 8-14 Known archaeological site densities dating to the last 2,000 years (Atlas of Namibia Team, 2022)

Figure 8-15 Known archaeological site densities dating to between 2,000 and 10,000 years ago (Atlas of Namibia Team, 2022)

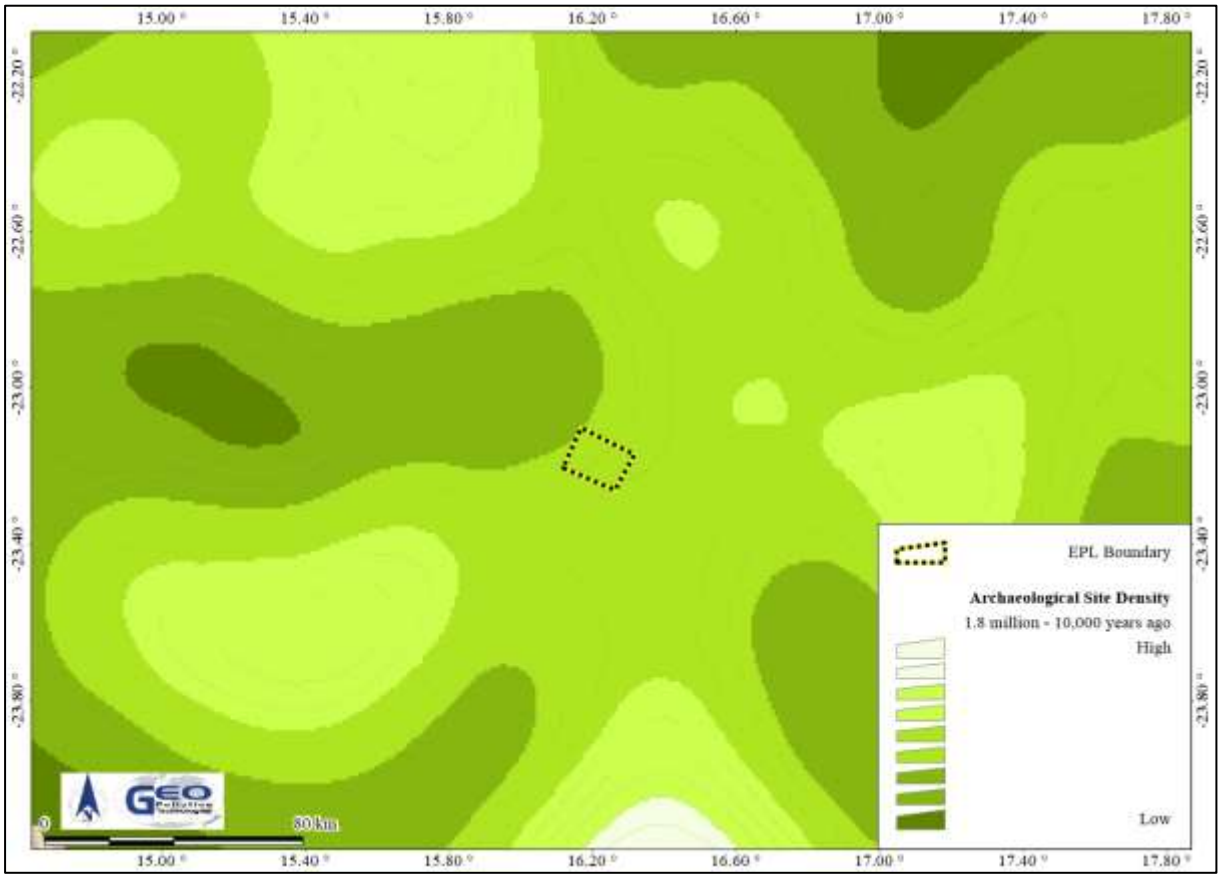


Figure 8-16 Known archaeological site densities dating to between 10,000 and 1.8 million years ago (Atlas of Namibia Team, 2022)

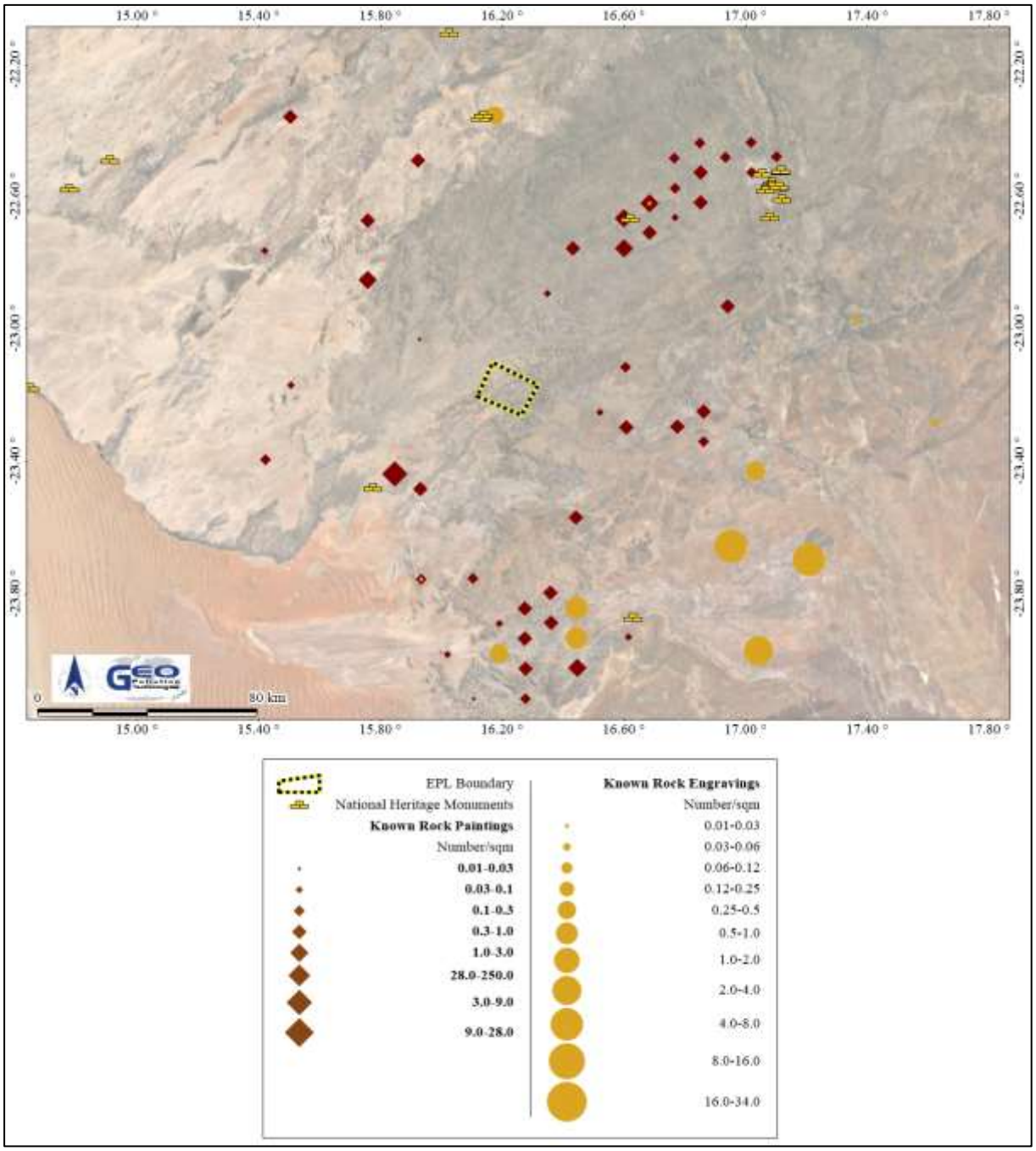


Figure 8-17 Declared national heritage monuments, density of known rock paintings and density of known rock engravings in relation to the EPL (Atlas of Namibia Team, 2022)

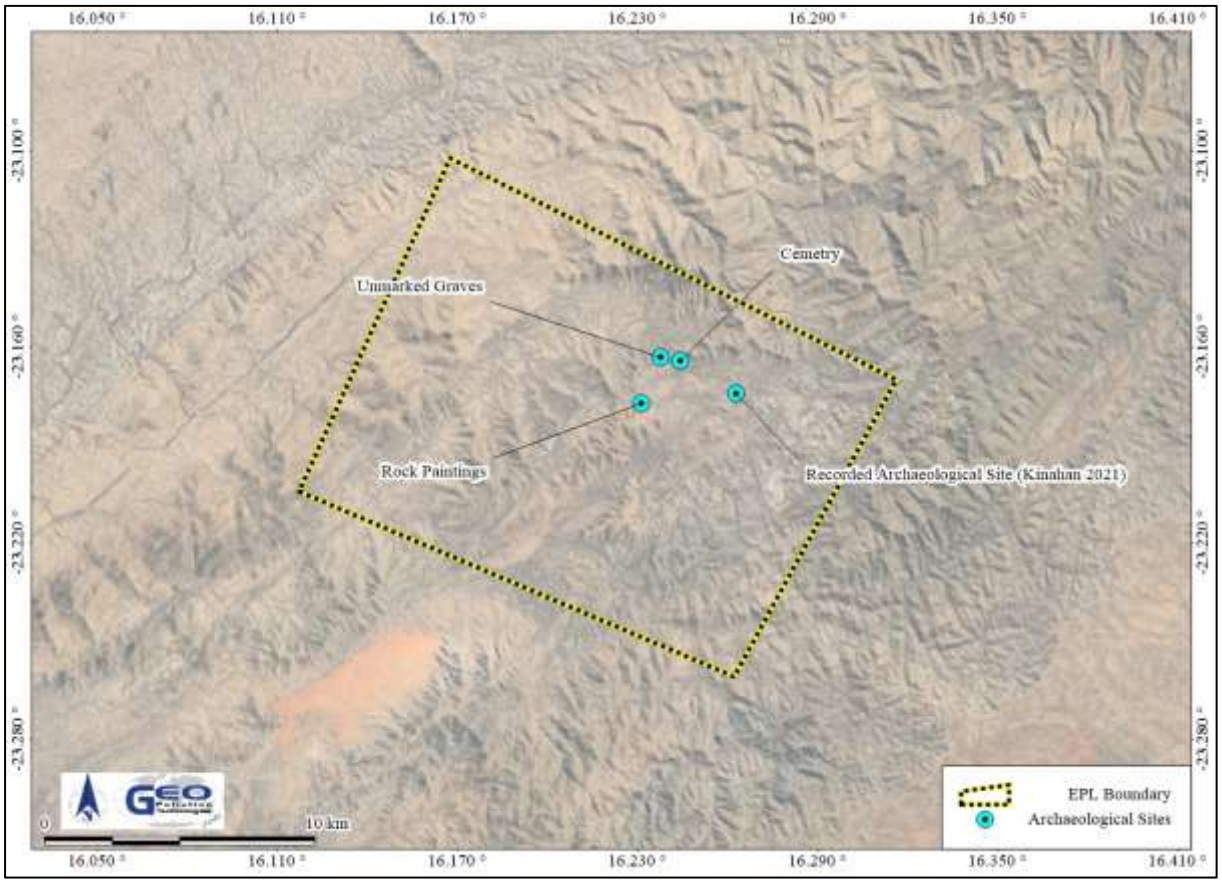


Figure 8-18 Sites of archaeological significance in the EPL area

Photo 8-21 Rock art

Photo 8-22 Rock art

Photo 8-23 Graveyard

Photo 8-24 Unmarked graves

Implications and Impacts

Due to the presence of rock art and unmarked graves on farm Tantus, and the EPL being within a general area with known high densities of archaeological sites dating between 2,000 and 10,000 years ago, it is highly probable that more such sites will be present in the EPL area. Since rock paintings are often quite faded, it is possible that such sites may go undetected when exploration teams visit the area. Specifically as they are not necessarily on the lookout for such sites. Invasive exploration techniques may then accidentally damage such sites.

9 PUBLIC CONSULTATION

Consultation with the public forms an integral component of an environmental assessment investigation and enables interested and affected parties (IAPs) e.g. neighbouring landowners, local authorities, environmental groups, civic associations and communities, to comment on the potential environmental impacts associated with project and to identify additional issues which they feel should be addressed in the environmental assessment.

Public participation for large project areas, overlapping multiple privately owned parcels of land, is quite difficult. Mainly because it is not that easy to identify all land owners and get the contact details of those who are successfully identified. In many instances, land owners of specifically commercial farms, are very reluctant to engage with anyone representing a mine, nor are they willing to share contact details of neighbours. For EPL 8049, all five land owners were contacted by hand delivered letter, phone and/or email. However, only three of the owners responded to requests for consultation. In addition, public participation notices were advertised for two weeks in two national newspapers, namely the Republikein and Namibian Sun, on the 11th and 18th of September 2024. Two site notices were also placed on the side of the C26 Main Road. The first on the eastern boundary of the EPL to target traffic from Windhoek, and the second on the western boundary to target traffic coming from Solitaire and Walvis Bay. See Appendix B for proof of the public participation processes.

Concerns regarding the project were raised during the public consultation phase. The main concerns from land owners were as follows:

Impacts on the already limited groundwater: All landowners who engaged in the consultation process indicated that water is a big concern in the area. Groundwater is the only source of potable water although it is supplemented for livestock and game watering by rain filling the earth dams. At the time of compiling this report, the ongoing drought has severely impacted groundwater availability, with some boreholes “running dry” due to decreasing water levels. The concern regarding groundwater is not so much linked to the exploration phase, but more with the potential future presence of a mine, should a minable resource be discovered.

Poaching and theft: Poaching is already a problem in some areas of the farms overlapped by the EPL. The poaching problem is, according to the land owners, originating from the presence of small scale miners on the government farm, Farm Bonna. The concern is that poachers or criminals will pose as part of the exploration team in order to gain access to the farm.

Light and air pollution: For the neighbouring Rooisand Desert Ranch a concern is that light and air pollution can occur which will diminish the quality of the night skies for stargazing. This will not only impact the ongoing astronomy business on Rooisand, but also at the Hakos Guest Farm. Light pollution refers to the presence of bright lighting in the area illuminating the skies and dust reducing visibility. This too, is more linked to potential future mining than the exploration phase per se.

Loss of farmland: This concern is also linked to potential future mining. The concern is that farming and mining cannot co-exist and should a mine realise, the farm will no longer be a viable farming unit.

10 IMPACT ASSESSMENT AND MANGEMENT OF IMPACTS

The purpose of this section is to identify and assess the most pertinent environmental impacts that are expected from the exploration activities of the Proponent. An EMP outlining preventative and mitigating measures, based on these identified impacts, is also incorporated into this section. Where impacts are positive in nature, enhancement measures are proposed to maximise the potential benefits.

For each impact an environmental classification was determined based on an adapted version of the Rapid Impact Assessment Method (Pastakia, 1998). Impacts are assessed according to the following categories: Importance of condition (A1); Magnitude of Change (A2); Permanence (B1); Reversibility (B2); and Cumulative Nature (B3) (see Table 10-1). Define reversibility and permanence Ranking formulas are then calculated as follow:

Environmental Classification = A1 x A2 x (B1 + B2 + B3).

The environmental classification of impacts is provided in Table 10-2.

The probability ranking refers to the probability that a specific impact will happen following a risk event. These can be improbable (low likelihood); probable (distinct possibility); highly probable (most likely); and definite (impact will occur regardless of prevention measures).

Table 10-1 Assessment criteria

Criteria	Score
Importance of condition (A1) – assessed against the spatial boundaries of human interest it will affect	
Importance to national/international interest	4
Important to regional/national interest	3
Important to areas immediately outside the local condition	2
Important only to the local condition	1
No importance	0
Magnitude of change/effect (A2) – measure of scale in terms of benefit / disbenefit of an impact or condition	
Major positive benefit	3
Significant improvement in status quo	2
Improvement in status quo	1
No change in status quo	0
Negative change in status quo	-1
Significant negative disbenefit or change	-2
Major disbenefit or change	-3
Permanence (B1) – defines whether the condition is permanent or temporary	
No change/Not applicable	1
Temporary	2
Permanent	3
Reversibility (B2) – defines whether the condition can be changed and is a measure of the control over the condition	
No change/Not applicable	1
Reversible	2
Irreversible	3
Cumulative (B3) – reflects whether the effect will be a single direct impact or will include cumulative impacts over time, or synergistic effect with other conditions. It is a means of judging the sustainability of the condition – not to be confused with the permanence criterion.	
Light or No Cumulative Character/Not applicable	1
Moderate Cumulative Character	2
Strong Cumulative Character	3

Table 10-2 Environmental classification (Pastakia 1998)

Environmental Classification	Class Value	Description of Class
72 to 108	5	Extremely positive impact
36 to 71	4	Significantly positive impact
19 to 35	3	Moderately positive impact
10 to 18	2	Less positive impact
1 to 9	1	Reduced positive impact
0	-0	No alteration
-1 to -9	-1	Reduced negative impact
-10 to -18	-2	Less negative impact
-19 to -35	-3	Moderately negative impact
-36 to -71	-4	Significantly negative impact
-72 to -108	-5	Extremely Negative Impact

10.1 RISK ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN

An EMP provides management options to ensure impacts of an activity are minimised. It is thus a tool used to take pro-active action by addressing potential problems before they occur. This should limit the corrective measures needed, although additional mitigation measures may be included where necessary. The environmental management measures are provided in the tables and descriptions below. These management measures should be adhered to during the various phases of exploration. This section of the report can act as a stand-alone document. All personnel taking part in exploration should be made aware of the contents of this section, so as to plan and execute exploration in an environmentally sound manner.

The objectives of the EMP are:

- to include all possible activities of exploration;
- to prescribe the best practicable control methods to lessen the environmental impacts associated with exploration;
- to monitor and audit the performance of personnel in applying such controls; and
- to ensure that appropriate environmental training is provided to responsible personnel.

Various potential and definite impacts related to the proposed exploration activities have been identified. The majority of these impacts can be prevented or mitigated. The impacts, risk rating of impacts, as well as prevention and mitigation measures are listed below.

As depicted in the tables below, impacts related to the exploration phase are expected to mostly be of low to medium significance and can mostly be mitigated to have a low significance or a low probability to occur. The extent of impacts are mostly site specific to local and are not of a permanent nature.

10.1.1 Planning Phase

Planning is not only limited to before the exploration phase is entered, but is ongoing throughout the validity of the awarded EPL. When planning to conduct exploration, it is the responsibility of Proponent to ensure all personnel and contractors are and remain compliant with all legal requirements and the provisions of the EMP. This includes ensuring that all required management measures are in place prior to and during exploration, to ensure potential impacts and risks are prevented or minimised. The management structure of the Proponent is presented in Figure 10-1.

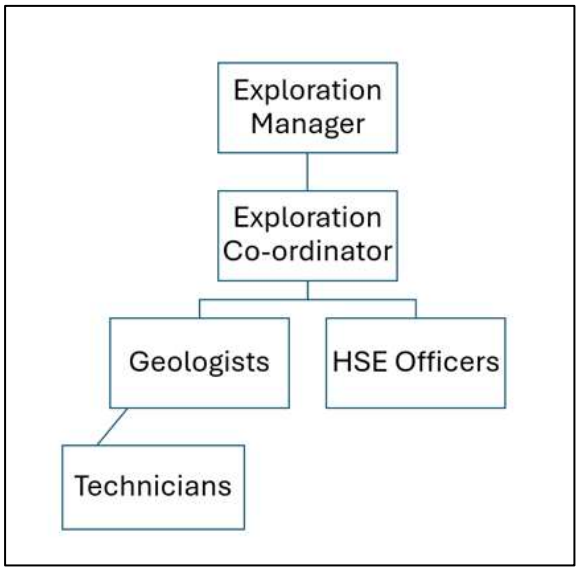


Figure 10-1 VMN organogram

The following actions are recommended for the planning phase and should continue during various other phases of the project:

10.1.1.1 Delegation of Responsibilities

- Make provisions to have a health, safety and environmental coordinator or similar to implement the EMP and oversee occupational health and safety as well as general environmental related compliance.
- Delegate EMP responsibilities to relevant personnel and contractors.

10.1.1.2 Risk Management and Emergency Response Preparedness

- Have relevant standard operating procedures and emergency response plans, equipment and personnel on site to prevent and deal with potential emergencies and incidents. Examples include health, safety and environment (HSE) manuals, site induction protocols, material safety data sheets, firefighting and evacuation plans and equipment, spill response plans, first aid training and first aid kits, etc.
- Have adequate public liability insurance to cover VMN for any incidents or liability claims.

10.1.1.3 Legal Compliance

- Compile an internal legal register outlining all required authorisations, permits and licences required to execute exploration activities.
- Comply with the various applicable acts and their respective regulations, for example pertaining to labour, income and other taxes and levies, work permits, etc.
- Ensure all necessary permits and authorisations from the various ministries, local authorities and any other bodies that govern exploration activities are in place and remains valid. These include the ECC, the EPL, drilling permits, permits for removal of protected trees (if required), exemption permits for storage of fuel, authorisations for aerial surveys, if any (drone or aeroplane), etc.
- Apply for renewal of the ECC prior to expiry.

10.1.1.4 Surface Access Agreements

- Enter into agreements with the various land owners affected by the EPL and exploration activities. Such agreements should clearly stipulate the responsibilities of all parties involved, including restrictions pertaining to entry, movement and activities on the land, expectations of the land owner regarding rehabilitation once exploration activities cease, etc.

10.1.1.5 Employment and Contractor Appointments

- Ensure all appointed employees and contractors enter into an agreement with the Proponent, which among others include contractual adherence to the EMP. Ensure the contents of the EMP are understood by the employees contractors, sub-contractors and all personnel present or who will be present on explorations sites. This may require environmental training pertaining to the "value of nature" (why we need to protect the environment), explanation of various terminology, monitoring requirements, consequences of non-compliance, etc.

10.1.1.6 Rehabilitation and Pollution Clean-up

- If not already established, establish and maintain a fund/insurance for rehabilitation of the exploration sites, or for unforeseen events where environmental pollution occur which requires clean-up and/or remediation.

10.1.1.7 Community Liaison

- Appoint a community liaison officer and devise a community liaison strategy. Communicate his/her contact details, and the procedures for filing of complaints or providing feedback/input, to the affected land owners and other relevant stakeholders.
- Maintain a complaints register which details, among others, the date the complaint is received, the name and contact details of the person filing the complaint, the nature of the complaint, action taken to address and prevent future incidents of a similar nature, a copy of the feedback provided to the person filing the complaint.

10.1.1.8 Monitoring and Reporting

- Maintain an incidents register which detail, among others, the date the incident occurred, the names and contact details of persons involved in the incident, the nature of the incident, and action taken to address and prevent future incidents of a similar nature.
- Establish and / or maintain an environmental reporting system to report on environmental management procedures and incidents as outlined in the EMP.
- Submit environmental monitoring reports to the MEFT in compliance with the conditions linked to the ECC.

10.1.2 Employment

Appointment of consultants already realises during the planning phase. This include those responsible for permitting. During exploration, some contractors may be appointed to conduct specialised tasks. Local consultants, contractors and their employees, are thus supported, and their livelihoods sustained. Some aspects may require expertise not locally available, in which case foreign consultants or contractors may be used.

The Proponent appoints unskilled, semi-skilled and specialist employees to perform tasks related to exploration. This range from office administration to the highly specialised activities involved with in-field geological surveys and drilling. Employment are sourced locally, however specialised skills may not be locally available and may be sourced from outside of Namibia.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Enhancement Measures									
Planning, Exploration and Site Decommissioning	Permanent employment opportunities and periodic appointment of consultants and third party contractors without prioritising Namibian citizens	3	1	2	2	1	15	2	Definite
With Enhancement Measures									
Planning, Exploration and Site Decommissioning	Prioritising Namibian citizens for permanent employment opportunities and periodic appointment of consultants and third party contractors	3	2	2	2	1	30	3	Definite

Desired outcome: To maximise the appointment of Namibian consultants, contractors and employees to contribute to a reduction in overall unemployment.

Actions

Enhancement:

- Employ local Namibians as far as practically possible.
- Appointment of foreign employees or contractors must be in line with the requirements of the Ministry of Home Affairs, Immigration, Safety and Security.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Labour Act
- Immigration Control Act
- Bi-annual summary report based on employee records with employee contracts, work permits, etc. on file.

10.1.3 Skills, Technology and Development

Development of people and technology are key to economic development. Exploration for mineral resources requires a workforce that ranges from highly specialised to general workers. Advanced exploration technologies are often used and training is provided to a portion of the workforce to be able to use these technologies and to perform certain tasks according to the required standards. Skills are periodically transferred to an unskilled workforce for general tasks. During normal exploration and related activities, employees will increase their work experience while some individuals may be identified for promotion and additional skills development and training.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Enhancement Measures									
Planning, Exploration and Site Decommissioning	Training and education, transfer of skills and technological development	3	1	2	2	1	15	2	Probable
With Enhancement Measures									
Planning, Exploration and Site Decommissioning	Training and education, transfer of skills and technological development	3	2	2	2	1	30	3	Definite

Desired Outcome: To see an increase in skills of local Namibians, as well as development and technological advancements in the mining industry and local community.

Actions

Enhancement:

- If the skills and technology exist locally, contractors and employees must be sourced from Namibia. Deviations from this practice is justified where local or Namibian options are not available.
- Skills development and improvement programs to be made available to Namibians as identified during employee performance assessments. This increases their chances of being successful in job applications if no longer employed by the Proponent.
- Employees to be informed about parameters and requirements for references upon employment. The Proponent to issue reference letters or testimonials to employees, during their period of employment, to ensure they have proof of work experience and competence should they leave the company.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Record should be kept of any formal or informal training provided.
- Ensure that all training is certified or managerial reference provided (proof provided to the employees) inclusive of training attendance, completion and implementation.
- Bi-annual summary report based on records kept.

10.1.4 Contribution to the Economy

Mining and mining related activities attract foreign investment. The Proponent's exploration activities in Namibia have and will continue to generate revenue which is paid to the national treasury. Various consultants, contractors and employees are remunerated and various taxes, levies and fees are paid. This stimulates Namibia's economic development and promotes additional investments and business development.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Enhancement Measures									
Planning, Exploration and Site Decommissioning	Contribution to the Economy	3	1	2	2	1	15	2	Probable
With Enhancement Measures									
Planning, Exploration and Site Decommissioning	Contribution to the Economy	3	2	2	2	1	30	3	Definite

Desired Outcome: Contribution to the national treasury and economy

Actions

Enhancement:

- Procurement and maintenance of vehicles and machinery from the Namibian business sector.
- The Proponent must employ local Namibians and contractors where possible.
- Adherence to all Namibian laws relating to the payment of taxes, levies, etc.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Bi-annual summary report based on employee and contractor records, procurement of goods and services, etc. on file.

10.1.5 Ideals and Aspirations for the Future

During the environmental assessment, pubic consultation was conducted with land owners and interested and or affected parties. Information shared with some of the parties resulted in a concerns for their future aspirations. This is mainly linked to the potential future presence of large-scale mines on the farms which may negatively impact the farming potential of their land. It however also relates to the presence of deviant people on the farms and an increase in poaching, theft, safety risks, etc. Although the presence of exploration companies on the land can create additional revenue streams for the land owner, (e.g. provision of services such as accommodation, or being employed by the Proponent), this is not regarded as a benefit by the land owners consulted.

Ideals and aspirations of employees are also considered. Poor communication between management and employees may lead to uncertainty in with regard to job security and options for promotion.

Project Activity/Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Mitigation Measures									
Planning, Exploration and Site Decommissioning	Negative impact on society's ideals and aspirations for the future	2	-2	2	2	1	-20	-3	Definite
After Mitigation Measures									
Planning, Exploration and Site Decommissioning	Positive impact on society's ideals and aspirations for the future	2	2	2	2	1	20	3	Highly Probable

Desired Outcome: Continued sharing of accurate and easily understandable information, planned activities, project progress and opportunities with land owners, IAPs and governing agencies. Maintaining an open door policy with land owners and IAPs.

Actions

Enhancement:

- Information sharing about the proposed project to explain in laymen's terms all proposed activities, timelines, potential impacts, potential benefits (opportunities), etc. The public consultation phase of the environmental assessment process was the first step in information sharing.
- Major changes in proposed exploration activities should be made available to land owners, governmental agencies and interested and affected parties.
- Open communication regarding future exploration activities, opportunities and employment with both land owners and employees.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Up to date stakeholder database
- Records kept of all information shared with authorities, neighbours and employees.

10.1.6 Demographic Profile and Community Health

The scale of the exploration project is limited and it is not expected to create a change in the demographic profile of the nearby local communities. Where possible, existing labour, already employed by the Proponent will be used or new labourers may be sourced from the land owner or nearby farms. Community health may be exposed to factors such as communicable disease like HIV/AIDS and tuberculosis (TB) and social ills or deviant behaviour like alcoholism/drug abuse, associated with increased spending power of the labour force. Similarly, workers from the exploration team may visit farm labourer compounds, and vice versa, and this may further expose both groups to the same social ills and diseases. Incidences of theft may occur and this may also be when criminals pose as employees of the exploration team present in the EPL area.

Positive impacts will relate to employees and contractors' increased economic resilience and improved livelihoods.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Communicable disease, alcoholism/drug abuse, deviant behaviour, criminal activities	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Communicable disease, alcoholism/drug abuse, deviant behaviour, criminal activities	2	-1	2	2	1	-10	-2	Improbable

Desired Outcome: To prevent the in-migration and growth of informal settlements and to prevent the spread of communicable diseases and prevent / discourage socially deviant behaviour and criminal activities.

Actions:

Prevention:

- Thorough background checks and testimonials when appointing new employees.
- Provide educational programmes / information sessions for employees on various topics of health, social behaviour, etc., including communicable diseases, financial management and general upliftment of employees' social status.
- Clearly stipulate restricted activities when working within the EPL. Include any such stipulated activities in surface access agreements.
- Provide time schedules, names and vehicle registration numbers to land owners well in advance (and any other information as per the surface access agreement). Communicate any changes to land owners.
- All employees to wear easily distinguishable uniforms/clothing, with name tags that can be checked against the provided list of employees who will be present on the land.
- Inform land owners of each arrival onto and each departure from the land.
- No movement out of areas pre-arranged with the landowner.
- In the event that the exploration team must make use of a temporary camp for accommodation on any privately owned land, adhere to the following:
    - Provide adequate sanitary and ablution facilities.
    - No unauthorised visitors to be allowed at exploration sites and camps.
    - Employees to stay at the camp and authorised areas and no wandering outside of these or visits to nearby workers' compounds.
    - All waste to be contained and removed from site to ensure hygienic conditions.

- Where contractors are required, ensure they are reputable and will strictly implement and follow the same measures as stipulated for the Proponent's team.

Mitigation:

- Disciplinary action for non-compliance must be communicated to all employees and contractors and implemented when incidents occur.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Surface access agreements
- Company policies, procedures and rules
- For temporary camps, regularly completed inspection sheets, for all areas which may present environmental health risks, must be kept on file.
- Bi-annual summary report based on educational programmes and training conducted.

10.1.7 Health and Safety

Various activities associated with exploration are reliant on physical human labour, in the outdoors, and the operation of machinery. Therefore health and safety risks exist. Such risks include exposure to environmental elements extreme heat or cold, sunstroke, dehydration, trips and falls, vehicle accidents, getting caught in moving parts of machinery, cuts, exposure to hazardous chemicals (e.g. hydrocarbons) and encounters with wild, potentially dangerous, animals.

The EPL is located about 160 km away from the nearest medical facilities located in Windhoek or 200 km from Walvis Bay.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Physical injury or exposure to elements	1	-3	2	2	1	-15	-2	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Physical injury or exposure to elements	1	-2	2	2	1	-10	-2	Improbable

Desired Outcome: To prevent injury and health impacts

Actions

Prevention:

- Implement and maintain an integrated health and safety management system.
- All health and safety standards specified in the Labour Act should be complied with.
- Ensure that all personnel receive adequate training on operation of equipment / handling of hazardous substances (mainly hydrocarbons – fuel, hydraulic fluid, etc.) and all drivers are appropriately licenced.
- All employees and visitors to the exploration areas must receive appropriate induction prior entry.
- Provide all employees with required and adequate personal protective equipment (PPE) and training in the proficient use thereof. This should include clothing and sunscreen to prevent sunburn or heatstroke.
- Ensure sufficient potable water is available to all workers at all times and remind employees to stay hydrated, especially in warm summer months.
- To prevent unauthorised entry, temporary camp and drill sites must be fenced off.
- Place and securely stow all heavy equipment (e.g. drill rods and casing) to prevent objects toppling over or falling on employees. Demarcate potentially dangerous areas like the drilling fluid sumps.
- No alcohol or recreational drugs should be allowed on site and no personnel should operate equipment under the influence of any drugs, including medicine that cause drowsiness and impaired judgement.
- Maintain all equipment and vehicles in good working order to minimise the risk of accidents (e.g. replacing of worn vehicle tyres, replacing damaged drill rods, etc.).
- Staff should be educated / trained on human wildlife conflict management and be informed not to approach wild animals and to be vigilant for, and not to confront (attempt to kill or catch), snakes or other potentially venomous / dangerous animals.
- Procedures for environmental incidents such as flash floods should be provided to employees.

Mitigation:

- Selected personnel should be trained in first aid and a first aid kit must be available on site.
- The contact details of all emergency services must be readily available and a satellite phone must be available if areas with no cellular reception is entered.
- In case of any injury or illness, first aid should be applied and the employee transported to a medical facility if required.
- For serious injuries, emergency services should be contacted for evacuation to the nearest emergency facility.
- All personnel with known medical conditions must keep their own medicine nearby at all times. This includes treatment for severe allergies to for example bee stings.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Any health and safety incidents must be recorded with action taken to prevent future occurrences.
- A bi-annual report should be compiled of all incidents reported. The report should contain dates when training were conducted and when safety equipment and structures were inspected and maintained

10.1.8 Security

Security risks will be related to unauthorised entry into temporary exploration camps, theft and sabotage. Similarly, the presence of foreign workers on the farms may expose the land owner to security issues such as theft (e.g. poaching, stock theft). Criminals may take the opportunity to pose as exploration team workers in order to access the farm.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Deviant behaviour and criminal activities	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Deviant behaviour and criminal activities	2	-1	2	2	1	-10	-2	Improbable

Desired Outcome: To prevent deviant and criminal behaviour such as theft.

Actions

Prevention:

- Thorough background checks and testimonials when appointing new employees.
- Clearly stipulate restricted activities when working within the EPL. Include any such activities stipulated in surface access agreements.
- Provide time schedules, names and vehicle registration numbers to land owners well in advance (and any other information as per the surface access agreement). Communicate any changes to land owners.
- All employees to wear easily distinguishable uniforms/clothing, with name tags that can be checked against the provided list of employees who will be present on the land.
- Inform land owners of each arrival onto and each departure from the land.
- No movement out of areas pre-arranged with the landowner.
- Prior to entering an EPL, confirm with the land owner which gates should be left open and which should be closed.
- Where contractors are required, ensure they are reputable and will strictly implement and follow the same measures as stipulated for the Proponent's team.

Mitigation:

- Disciplinary action for non-compliance must be communicated to all employees and contractors and implemented when incidents occur.
- Vehicles accessing farms could be fitted with trackers and dash cams to allow the Proponent to investigate any complaints made by landowners about unauthorised movement and incidents on their land.
- Report any suspected "out of the ordinary" sightings such as dead animals (suspected poaching), open gates, suspicious persons, etc. to the land owner.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Surface access agreement
- Any incidents must be recorded with action taken to prevent future occurrences.
- A bi-annual report should be compiled of all incidents reported and action taken.

10.1.9 Vehicle Movement

Exploration activities occur on farmland, thus traffic impacts on public roads will be limited to the occasional movement of vehicles to and from the EPL when exploration is performed. This can include slow moving drill rigs. The impact on public roads are expected to be minor.

Although only a few vehicles will access private roads in the EPL area, such as on privately owned farms, it may constitute a significant increase in traffic compared to the status quo. Potential impacts include dust, noise, running over or collisions with wildlife, stressed wildlife, and damage to roads, especially when it rains and road surfaces are wet and muddy.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Traffic impacts during delivery of large equipment and building materials	2	-2	2	2	2	-24	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Traffic impacts during delivery of large equipment and building materials	2	-1	3	2	2	-14	-2	Improbable

Desired Outcome: Minimum impact on traffic on public roads, no transport or traffic related incidents, impacts and disturbances on privately owned land/roads.

Actions

Prevention:

- All drivers of vehicles must have valid drivers' licences appropriate for the vehicle driven and be trained in off-road driving.
- All vehicles to be roadworthy and appropriately licensed.
- If significant traffic impacts are expected on public roads, possibly as a result of slow moving drill rigs, traffic management should be performed.
- Implement speed limits on farm roads to minimise dust and noise and to prevent running over or collisions with wildlife. For roads near residences or livestock enclosures, and for very dusty roads, speed can further be reduced.
- All drivers should be vigilant for any wildlife near or in roads to prevent running over or collisions with wildlife.
- Maintain all vehicles' in good mechanical condition to ensure they do not produce excessive noise.
- For rough terrain and steep ascents, engage four-wheel drive and reduce tyre pressure to prevent unnecessary wheel spin and damage and corrugation of roads.

Mitigation:

- Repair any damaged roads.
- Report any collisions with livestock or wildlife to the land owner.
- Vehicles accessing farms could be fitted with trackers and dash cams to allow the Proponent to investigate any complaints made by landowners about unauthorised movement and incidents on their land.
- Disciplinary action for non-compliance must be communicated to all employees and contractors and implemented when incidents occur.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Any complaints received regarding vehicle movement should be recorded together with action taken to prevent impacts from repeating itself.
- A bi-annual report should be compiled of all incidents reported, complaints received, and action taken

10.1.10 Noise

Noise related to exploration activities is mainly limited to vehicle movement and exploration drilling. Although it is not specifically planned, it may be possible that aeroplane or drone technology be used for aerial photography or geophysical surveys, this may result in noise, especially at low altitude flying.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Noise generated from the exploration activities – nuisance and stressed animals	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Noise generated from the exploration activities – nuisance and stressed animals	2	-1	2	2	1	-10	-2	Improbable

Desired Outcome: To prevent any hearing loss among employees and not to be a nuisance or cause stress in wildlife and livestock.

Actions

Prevention:

- Follow Health and Safety Regulations of the Labour Act on maximum noise levels to prevent hearing impairment of employees, specifically if drilling is conducted.
- All vehicles and machinery must be regularly serviced to ensure minimal noise production. This include fitting noise dampers on for example compressors used for reverse circulation drilling.
- Exploration activities should only be conducted in daytime, during weekdays, unless otherwise arranged with the land owner.
- If drones or aeroplanes are used for aerial surveys, it should be performed at times agreed upon with the land owner.
- Drone or aeroplane surveys must be performed for the minimum time possible, and as high above the ground as possible, while still ensuring good quality data.
- Noise dampers to be fitted on machines where suitable and alternative signalling adopted where possible.
- For vehicle noise also refer to section 10.1.9.

Mitigation

- Personnel working in noisy environments must be issued with hearing protectors, specifically if drilling is conducted.
- Where aeroplanes or drones cause distress in animals, operations should cease until they have moved away, before it can continue.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act, Civil Aviation Act
- Surface access agreement.
- Maintain a complaints register.
- Bi-annual report on complaints and actions taken to address complaints and prevent future occurrences.

10.1.11 Fire

Fires outside of designated areas and discarded cigarettes can cause veld fires which can quickly spread and get out of control. Similarly, machinery can ignite dry vegetation if sufficient heat (e.g. exhaust pipes) or sparks are produced. Fuels stored and used for exploration activities may be flammable. Veld fires originating elsewhere (e.g. lightning) can pose a threat to the exploration teams.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Fire risks	2	-3	2	2	1	-30	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Fire risks	2	-2	2	2	1	-20	-3	Improbable

Desired Outcome: To prevent fires causing property damage, loss in vegetation, possible injury caused by uncontrolled fires.

Actions:

Prevention:

- Prepare a holistic fire protection and prevention plan. This plan must include an emergency response plan and a firefighting plan.
- Personnel training (safe operational procedures, firefighting, fire prevention and responsible housekeeping practices).
- All vehicles to be fitted with fire extinguishers and have equipment to specifically fight veld fires available.
- For drilling sites and if temporary camps are used:
  - Maintain regular vehicle and machinery mechanical and electrical inspections and maintenance.
  - Ensure all flammable chemicals are stored according to material safety data sheet (MSDS) and SANS instructions and all spills or leaks are cleaned up immediately.
  - Have serviced firefighting equipment within easy reach, including those used to fight veld fires.
  - Fire used for purposes such as cooking must only be allowed within designated areas far removed from any flammable material such as dry vegetation.

Mitigation:

- Implement the fire protection and firefighting plan in the event of a fire.
- Quick response time by trained staff will limit the spread and impact of a fire.
- Communication methods (e.g. satellite phones where cellular phone reception is limited) must be available at all times for rapid communication with the land owner and surrounding farmers to immediately be able to notify them of a fire. A rapid response to a veld fire is crucial in bringing it under control and extinguishing it as soon as possible.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A register of all incidents must be maintained on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.

- A bi-annual report should be compiled of all incidents reported. The report should contain dates when fire drills were conducted and when fire equipment was tested and training given.

10.1.12 Visual Impact

Activities that may have a visual impact are exploratory drilling, the associated roads leading to drill sites, and possible erosion where vegetation is cleared. Rehabilitated drill sites and cleared areas takes time to recover to such an extent that it is no longer visible, and are prone to erosion. Newly drilled boreholes are distinctly visible due to the vegetation clearing and waste rock usually associated with such sites. Borehole casing protruding from the ground also has a visual impact. Numerous drill sites will thus alter the landscape character. In addition newly drilled sites are often uniquely visible from the air and on open source satellite imagery due to the presence of drill cuttings and dust. Such changes may affect receptors which are reliant on the existing landscape character (such as tourism).

Excessive lighting used at night may reduce visibility of stars and may impact on nearby observatories. This impact is however not probable during exploration, especially since no night time exploration is planned, but could be significant should mining realise.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Visual impact and a change in landscape character	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Visual impact and a change in landscape character	2	-1	2	2	1	-10	-2	Probable

Desired Outcome: To minimise potential visual impacts and changes to the landscape character.

Actions

Mitigation:

- At the drill site, regular waste disposal and good housekeeping will ensure a low visual impact.
- Drill sites should be sufficiently rehabilitated. All drill cores as well as cuttings with a significantly different colour than the surface soil should be removed from site. Other cuttings can be dispersed around the site and loosely raked to limit the visual impact.
- Stored topsoil should be returned and spread over the site to speedup re-establishment of vegetation.
- Compacted soil must be ripped along contour and not down slope. This will loosen soil, promote water infiltration, aid re-vegetation and limit soil erosion.
- In the event of work having to be conducted at night (e.g. in emergency situations), the minimum lighting required for safe operations should be used and all lighting should be directed downwards. Lights should be fixed to prevent it from swaying in the wind.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- A report should be compiled of all complaints received and actions taken.
- Maintain a photo log for comparison of all exploration (drill) sites prior to entry by the drill team and after rehabilitation is completed.

10.1.13 Soil, Surface Water and Groundwater Impacts

Groundwater is the only source of potable water within the EPL area. Infiltration of as much uncontaminated precipitated water is greatly desired so as to recharge groundwater resources. Care must thus be taken to avoid contamination of soil and surface water. No known permanent surface water sources are present within the EPL area. Pollution in dry riverbeds may however result in downstream and groundwater pollution when they flow during rainy seasons.

Contamination of the groundwater can occur via polluted water infiltrating through sediments or through fractures, joints and faults that are present in the subsurface. Soil contamination can occur from chemical and hydrocarbon spills during refuelling, during maintenance of equipment and machinery, or if mobile fuel tanks (bowsers) are involved in accidents on route to drill sites. Hydraulic oil leaks are common on drilling rigs and pipe bursts may release oil into the environment. Contamination of groundwater could also occur through infiltration of waste from field toilets. This is specifically applicable to exploration camp sites.

Soil may further become compacted or disturbed (powdered) as a result of heavy motor vehicles and equipment and this affects soil quality and may lead to excessive erosion. Similarly clearing of slopes greater than 12.5° may present a greater erosion risk.

Drilling of exploration holes may penetrate a confining aquifer layer (aquitard). This may cause mixing of aquifer water where the one aquifer may contain water of a poor quality, causing contamination of the aquifer having better quality. An alternative impact may be the leaking of water from one aquifer into another, causing existing boreholes to dry up or springs to dry up. Based on the limited amount of information available, it is not expected that such impacts would occur within the project area. It would however be advisable to take care during drilling that proper monitoring is taking place to evaluate for such conditions and that appropriate remedial actions be implemented where needed – the precautionary principal should be applied.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Contamination from hazardous material spillages	2	-3	2	2	1	-30	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Contamination from hazardous material spillages.	2	-2	2	2	1	-20	-3	Improbable

Desired Outcome: To prevent the contamination of soil and water.

Actions

Prevention:

- Training of operators of machinery and vehicles and employees must be conducted on a regular basis (responsible driving, fuel and chemical handling, spill detection, spill control).
- All machinery and vehicles should be properly maintained to be in a good working condition with no leaks and reduced possibilities of pipe bursts/breakages.
- Employ drip trays and spill kits when leaks are detected or servicing / repairs of equipment is needed.
- The contents of mobile chemical toilets must be removed from site and disposed of at a registered waste water treatment plant.

- Limit movement to existing roads as far as is practically possible.
- Limit interference with drainage lines.
- Where drill sites are levelled to create drill pads and campsites, topsoil must be stored for rehabilitation purposes after drilling is complete and the site is decommissioned.
- If land clearing is required in areas with a slope greater than 12.5°, mitigation measures should be employed to prevent erosion and formation of gullies. All mitigation measures to be agreed with the land owner.

Mitigation:

- Any fuel spillage of more than 200 litre must be reported to the Ministry of Mines and Energy.
- Spill clean-up means must be readily available on site as per the relevant MSDS and any spill must be cleaned up immediately to prevent it from reaching sensitive receptors.
- Hazardous waste must be contained and disposed of at a suitably classified hazardous waste disposal facility.
- Rehabilitate areas where soil or drainage lines are disturbed.
- Compacted areas can be lightly ripped and contoured to encourage vegetation establishment and to get rid of tracks.
- After exploratory drilling is complete, the boreholes must be handled according to the drill permit conditions. Where such conditions are lacking, boreholes should either be backfilled or secured with a steel or unplasticized polyvinyl chloride (uPVC) casing equipped with a secure cap. Drill cuttings should not be used for backfilling boreholes as minerals in the cuttings may have oxidised and will then potentially be released into the groundwater, together with salts present in the cuttings. Clean sand or clay should be used where possible.
- Backfilling or closing of the boreholes should be performed to avoid organisms from falling into the boreholes and to prevent surface runoff from contaminating the groundwater, where the borehole will form a preferential flow path if not properly sealed.
- Boreholes should be cemented where boreholes intersect confining layers separating aquifers with different water quality or causing artesian conditions.

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Maintain MSDS file for hazardous chemicals.
- Maintain a photo log for comparison of all exploration (drill) sites prior to entry by the drill team and after rehabilitation is completed
- Report all spills or leaks to management and immediately initiate clean-up.
- Maintain a register of all incidents on a daily basis. This should include measures taken to ensure that such incidents do not repeat themselves.

10.1.14 Ecosystem and Biodiversity Impacts

Some exploration activities are intrusive in nature, although mostly with relatively low impact. New roads may be required to allow machinery to be moved to exploration targets and drill sites will need clearing. Employees involved with exploration may be involved with poaching and illegal collection of plant and animal materials. Poachers may also use the presence of exploration teams on farms, to pose as members of the team, in order to poach. Impacts may also be related to pollution of the environment. Human / wildlife interactions further present a risk to both the wildlife and the people involved.

Disturbed sites are prone to the rapid establishment of invasive plants.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Poaching and ecological damage	2	-3	2	2	1	-30	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Poaching and ecological damage	2	-2	2	2	1	-20	-3	Improbable

Desired Outcome: To prevent poaching, ecological damage and pollution.

Actions

Prevention:

- Educate all contracted and permanent employees on the value of biodiversity and the importance of protecting the environment from disturbance.
- Where possible, removal of trees, especially protected species and large trees, must be avoided. The necessary permits from the Directorate of Forestry of the MEFT must be obtained for removal of all protected species.
- Liaise with the land owner on routes to be followed where new roads should be made and whether such roads should be rehabilitated after exploration ends or be left as is for the owner's use.
- Areas to be cleared must first be inspected for nests and burrows and these should be avoided.
- Strict conditions prohibiting harvesting and poaching of fauna and flora should be part of employment contracts. This includes prohibitions or regulations on the collection of firewood.
- Procedures to deal with human-wildlife conflict should form part of employee training/induction. The unwarranted killing of potentially dangerous animals, or those perceived as dangerous, or animals typically feared due to superstitious reasons, should be strongly discouraged.
- The footprint of drill sites, their associated laydown areas and access routes, should be kept to the smallest area possible and movement of vehicles outside of these area must be prohibited.
- Where drill sites are levelled to create drill pads, topsoil (overburden) must be stored for rehabilitation purposes after drilling is complete and the site is decommissioned.
- Exploration equipment transferred from completely different habitats to the EPL area must be thoroughly cleaned to limit the potential transfer of alien species to the area.
- Restrict driving to designated areas and avoid off-road driving.

Mitigation:

- Report any extraordinary animal sightings, conflict or incidents to the farm owner and MEFT.
- Report any suspicious people or dead animals, snares or traps encountered during exploration to the land owner.
- Mitigation measures related to waste handling and the prevention of groundwater, surface water and soil contamination should limit ecosystem and biodiversity impacts from pollution.
- At campsites, prevent scavenging of any waste by fauna.
- Disciplinary actions to be taken against all employees failing to comply with contractual conditions related to poaching and the environment.
- Compacted areas can be lightly ripped to encourage vegetation establishment and to get rid of tracks.
- Topsoil should be returned to such sites in order to re-establish the seed bank.
- Alien invasive species should be eradicated from drill sites during follow-up visits to rehabilitated areas.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Permits to remove protected trees as per the Forestry Act, if any, on file.
- Invader species eradication to be reported on.
- All information and reporting to be included in a bi-annual report.

10.1.15 Dust

Dust may be generated as a result of vehicles travelling on gravel roads, strong winds picking up dust in cleared areas, and drilling. Due to the specific drilling methods, only limited dust will be caused as a result of drilling.

Excessive dust, especially on days with little or no wind may reduce visibility of stars and may impact on nearby observatories. This impact is however not probable during exploration, but could be more significant and likely should mining realise.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Dust	2	-2	2	2	1	-20	-3	Definite
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Dust	2	-1	2	2	1	-10	-2	Probable

Desired Outcome: To prevent any nuisance or health impacts as a result of dust.

Actions

Mitigation:

- Responsible driving speeds on gravel roads will limit dust generation.
- Road surfaces that become powdered due to heavy equipment must be rehabilitated to reduce dust.
- Dust masks as standard PPE for workers in situations with excessive dust.
- Implement dust suppression measures where possible and especially at drill sites close to public roads or near observatories and other hospitality facilities, if needed

Responsible Body:

- Proponent
- Contractors

Data Sources and Monitoring:

- Health and Safety Regulations of the Labour Act.
- Maintain a complaints register.
- Bi-annual reporting on complaints and actions taken to address complaints and prevent future occurrences.

10.1.16 Waste

Various forms of waste will be produced during exploration activities. Waste may include hazardous waste associated with hydrocarbon products and chemicals, including soil and water contaminated with such products. Domestic waste will be generated by the workers. Sewage in chemical toilets will be produced. Waste presents a contamination risk and when not removed regularly may become a health and / or fire hazard and attract wild animals and scavengers. Due to the potential visual difference between drill cuttings and drill cores and the natural soil cover, it may be regarded as a type of waste.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Waste, littering and pollution	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Waste, littering and pollution	2	-1	2	2	1	-10	-2	Improbable

Desired Outcome: To reduce the amount of waste produced, and prevent contamination, pollution and littering.

Actions

Prevention:

- Develop a waste management plan and educate workers on the importance of proper waste management.
- Waste reduction measures should be implemented and all waste that can be re-used / recycled must be kept separate.
- Ensure adequate waste storage facilities are available that will prevent waste from being blown away by wind or being scavenged (human and non-human) or attract vermin.
- Hazardous wastes such as used oil and oil/diesel contaminated soil or water must be contained.
- In the unlikely event of a french drain being erected for employees, it should adhere to the Ministry of Agriculture, Water and Forestry guideline documents for the siting and construction of such facilities.

Mitigation

- All waste must be removed from the drill sites and camps once drilling is complete. Waste should be disposed of at appropriately classified disposal facilities, this includes hazardous material (empty chemical containers (e.g. oil containers) and contaminated materials (rugs, paper water and soil). Empty chemical containers must be destroyed in a way that would prevent reuse as a container after disposal.
- All drill cores as well as cuttings with a significantly different colour than the surface soil should be removed from site. Other cuttings can be dispersed around the site and loosely raked to limit the visual impact.
- Contents of chemical toilets must be removed from site and disposed of at a registered waste water treatment facility.

Responsible Body:

- Proponent
- Contractors

Data Ssources and Monitoring:

- A register of hazardous waste disposal should be kept. This should include type of waste, volume as well as disposal method/facility.
- Any complaints received regarding waste should be recorded with notes on action taken.
- All information and reporting to be included in a bi-annual report.

10.1.17 Heritage Resources

There are known archaeological sites within the EPL. During exploration, there may be additional chance discoveries of archaeologically or culturally important artefacts. This includes for example signs of early human habitation, rock art, unmarked graves, fossils, etc. This will have a positive academic value if preserved, but a negative impact if damaged.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Damaged archaeologically or culturally important artefacts	4	-3	3	3	1	-84	-4	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Preserved archaeologically or culturally important artefacts	4	3	3	3	1	84	4	Probable

Desired Outcome: To prevent the damage to, or destruction of, any archaeological, paleontological or culturally important (heritage) resources.

Actions

Prevention:

- Educate employees and contractors on what constitutes a possible heritage or archaeologically significant find and inform them to be vigilant for any extraordinary finds and to prevent any damage.
- The known archaeologically significant sites (rock art, unmarked graves, etc.) should be completely avoided.
- Prior to entry into the EPL area, the land owners should again be queried on their knowledge of the presence of archaeologically sensitive areas.
- Should exploration proceed into more invasive techniques such as drilling, that may require land clearing, an archaeologist should be consulted, and if deemed necessary, a site visit arranged.

Mitigation:

- If and site or any other archaeologically important artefact is found during exploration, the "chance find procedure" must be implemented. In short, any work in that area must be halted, the area demarcated and the National Heritage Council informed.
- For any human remains, the Namibian Police must be informed as a first action.
- Work may only resume once the necessary permission is provided by the National Heritage Council.

Responsible Body:

- Proponent

Data Sources and Monitoring:

- Documenting and reporting of any incidents related to heritage, archaeological or paleontological resources.

10.1.18 Impacts on Utilities and Infrastructure

Any damage caused to existing infrastructure and services supply like fences, reservoirs, troughs, roads, pipelines and electricity supply where present. This includes damage/erosion of farm roads due to the movement of heavy machinery such as drill rigs to exploration sites. Borehole casings that becomes overgrown also present a danger to land owners who sometimes drive off road and collide with them, causing damage to their cars.

Project Activity / Resource	Nature (Status)	(A1) Importance	(A2) Magnitude	(B1) Permanence	(B2) Reversibility	(B3) Cumulative	Environmental Classification	Class Value	Probability
Without Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Disruption in services supply and infrastructure damage	2	-2	2	2	1	-20	-3	Probable
After Preventative / Mitigation Measures									
Exploration and Site Decommissioning	Disruption in services supply and infrastructure damage	2	1	2	2	1	-10	2	Improbable

Desired Outcome: No impact on utilities and infrastructure.

Actions

Prevention:

- The Proponent must determine exactly where infrastructure like pipelines are situated. Liaison with owners of the land or suppliers of services (if applicable) is essential.
- Damaged farm roads and associated erosion ditches must be repaired in accordance with pre-arranged agreements with the land owner. The use of drill cuttings for this purpose should be considered as this will also serve as drill site rehabilitation.
- The land owner must be informed of the exact positions of any borehole casings protruding above the ground.

Mitigation:

- Emergency procedures for corrective action available on file.

Responsible Body:

- Proponent
- Contractors
- Land owner or suppliers of services

Data Sources and Monitoring:

- A report should be compiled of all incidents that occurred and corrective action taken.

10.2 ENVIRONMENTAL MANAGEMENT SYSTEM

The Proponent could implement an environmental management system (EMS) for their operations. An EMS is an internationally recognized and certified management system that will ensure ongoing incorporation of environmental constraints. At the heart of an EMS is the concept of continual improvement of environmental performance with resulting increases in operational efficiency, financial savings and reduction in environmental, health and safety risks. An effective EMS would need to include the following elements:

- A stated environmental policy which sets the desired level of environmental performance;
- An environmental legal register;
- An institutional structure which sets out the responsibility, authority, lines of communication and resources needed to implement the EMS;
- Identification of environmental, safety and health training needs;
- An environmental program(s) stipulating environmental objectives and targets to be met, and work instructions and controls to be applied in order to achieve compliance with the environmental policy;
- Periodic (internal and external) audits and reviews of environmental performance and the effectiveness of the EMS; and
- The EMP.

11 CONCLUSION

Votorantim Metals Namibia requires an ECC to allow for exploration activities on EPL 8049 in the Khomas Region. Geo Pollution Technologies conducted an environmental assessment to determine the impacts of exploration on the environment of the specific EPL. The exploration activities of VMN can play a positive role in the Khomas Region and Namibia as a whole. Through VMN, foreign funds are invested in Namibia and employment within VMN and their contractors are sustained. This improve employees' livelihoods and spending power which has a knock-on effect when they in turn support various business. Exploration activities also have the potential to benefit land owners, through compensation or when VMN acquires resources from them.

Negative impacts of exploration entails limited ecological disturbances where vegetation needs clearing for exploration. Pollution of the environment can occur when there are hydrocarbon leaks from drilling equipment and vehicles, or where waste is not contained and removed from site. Poaching is a big concern for land owners and criminals may seize the opportunity to pose as a member of the exploration team to gain access to the land. The area has known archaeological sites and it is likely that there are more. Utmost care must be taken not to disturb or damage such sites. An archaeologist should be consulted when more invasive techniques are planned, such as drilling, and an archaeologist consulted. Fire, dust, erosion, noise and deterioration of farm roads are also impacts associated with exploration. Exploration related impacts must be prevented or mitigated by implementing the EMP and through strict monitoring and control. All permits and approvals must be obtained from relevant ministries or authorities. Pollution prevention measures should be adequate to prevent incidents that may potentially pollute soil, ground water and surface water. Health, safety and security regulations should be adhered to in accordance with the regulations pertaining to relevant laws and standards. Of main importance is that surface access agreements be reached with land owners and that the conditions stipulated in these agreements are adhered to at all times.

The EMP (section 10.1) should be used as an on-site reference document during exploration. Parties responsible for transgressing of the EMP should be held accountable according to the Proponent's standard procedures for handling of misdemeanours. The Proponent should use an in-house health, safety, security and environment management system, or similar, in conjunction with the EMP. All exploration personnel and contractors must be taught the contents of these documents.

Should the MME and Directorate of Environmental Affairs in the MEFT find that the impacts and related mitigation measures, which have been proposed in this report, are acceptable, the necessary authorisations and ECC may be granted to the Proponent. The ECC issued, based on this document, will render it a legally binding document which should be adhered to.

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Appendix A: Tree Atlas of Namibia List of Trees Known to Occur in the EPL Area

Trees recorded in the Tree Atlas of Namibia as occurring in QDS 2316AA and 2316AB (Curtis & Mannheimer, 2005)

Species	Common Name	Conservation Concerns
Acacia erioloba	Camel-thorn	Protected by forestry legislation
Acacia erubescens	Yellow-bark Acacia	None
Acacia hebeclada subsp *hebeclada*	Candle-pod Acacia	None
Acacia hereroensis	Mountain-thorn	None
Acacia karroo	Sweet-thorn	None
Acacia luederitzii var *luederitzii*	Kalahari Acacia	None
Acacia mellifera subsp *detinens*	Blue-thorn Acacia	Aggressive invader
Acacia reficiens subsp *reficiens*	Red-thorn	Very aggressive invader
Acacia senegal var *rostrata*	Three-hook Acacia	None
Acacia tortilis subsp *heteracantha*	Umbrella-thorn	None
Adenolobus garipensis	Butterfly-leaf	None
Albizia anthelmintica	Worm-cure Albizia; Aru	Protected by forestry legislation.
Aloe dichotoma	Quiver Tree	Protected by the Nature Conservation Ordinance as a CITES Appendix II species. Protected by forestry legislation.
Aloe littoralis	Windhoek Aloe	Potentially threatened by pachycaul trade. Protected by the Nature Conservation Ordinance and listed in CITES Appendix II.
Boscia albitrunca	Shepherd's Tree	Protected by forestry legislation.
Boscia foetida subsp *foetida*	Smelly Shepherd's-bush	None
Catophractes alexandri	Trumpet-thorn; Rattlepod	Invasive in some areas
Combretum apiculatum subsp *apiculatum*	Kudu-bush	None
Commiphora glandulosa	Tall Common Corkwood	None
Commiphora glaucescens	Blue-leaved Corkwood	None
Commiphora pyracanthoides	Fire Thorn Corkwood;Small Common Corkwood	None
Commiphora tenuipetiolata	Satin-bark Corkwood	None
Commiphora virgata	Slender Corkwood	Endemic to Namibia. Potentially threatened by illegal pachycaul trade. Protected by forestry legislation.
Cordia sinensis	Grey-leaved Saucer-berry	None
Cyphostemma bainesii	Gouty-Vine	Rare and Endemic to Namibia. Protected by Nature Conservation Ordinance. Classified as least concern (IUCN). Potentially threatened by Pachycaul trade. Protected by forestry legislation.
Dichrostachys cinerea subsp *africana*	Kalahari Christmas Tree; Sickle-bush	Of concern because of its effects on other species (invasive)
Dombeya rotundifolia	Wild Pear	Two varieties r*otundifolia* and *velutina*. *Velutina* is endemic and classified as least concern.
Ehretia alba	White-puzzle Bush	None

Elephantorrhiza suffruticosa	Skew-leaved Elephant Root	None
Euclea pseudebenus	Wild Ebony	Protected by forestry legislation
Euclea undulata var myrtina	Common Guarri; Mountain Ebony	None
Euphorbia guerichiana	Paper-bark Euphorbia	Listed in CITES Appendix II
Euphorbia virosa	Candelabra Euphorbia	Listed in CITES Appendix II
Faidherbia albida	Winter-thorn; Ana Tree	Protected by forestry legislation.
Ficus cordata subsp *cordata*	Namaqua Rock-fig	Protected by forestry legislation
Grewia bicolor var *bicolor*	Two-coloured Raisin-bush	None
Grewia flava	Velvet Raisin	None
Grewia tenax var *tenax*	Small-leaved Cross-berry	None
Gymnosporia senegalensis	Confetti Spikethorn	None
Lycium bosciifolium	Limpopo Honey-thorn	None
Lycium eenii	Broad-leaved Honey-thorn	None
Maerua parvifolia	Small-leaved Maerua	None
Maerua schinzii	Ringwood Tree	Protected by forestry legislation.
Manuleopsis dinteri	Dinter's Bush	Endemic to Namibia.
Montinia caryophyllacea	Wild Clove-bush	None
Moringa ovalifolia	Moringa; Phantom Tree	Potentially threatened by pachycaul trade. Protected by Nature Conservation Ordinance. Near endemic to Namibia extending into southern Angola. Protected by forestry legislation.
Nymania capensis	Chinese-lanterns	Either overlooked or declined
Obetia carruthersiana	Angola Nettle	None
Ozoroa crassinervia	Namibian Resin-tree	Near-endemic stretching into the Richtersveld.
Parkinsonia africana	Green-hair Tree	None
Phaeoptilum spinosum	Brittle-thorn	None
Prosopis spp	Prosopis	Alien. Invasive in some areas.
Rhigozum trichotomum	Three-thorn Rhigozum	None
Salvadora persica var *persica*	Mustard Bush	None
Searsia lancea	Willow Rhus	Protected by forestry legislation. Previously *Rhus lancea.*
Searsia marlothii	Bitter Karee	None
Searsia pyroides	Fire-thorn Rhus; Common Currant	None
Steganotaenia araliacea var *araliacea*	Carrot-tree	None
Sterculia africana var *africana*	Tick Tree	Protected by forestry legislation
Ziziphus mucronata	Buffalo-thorn	Protected by forestry legislation

Appendix B: Proof of Public Consultation

Notified and Registered IAPs

Name	Affiliation
Georg Schurz	Farm Djab and Natas
Riaan Bredenkamp	Farms Kos and Chaibis
Seef Stapelberg	Farms Tantus and Otsus
Ministry of Agriculture, Water and Land Reform	Farm Bonna
Axel Dainat	Rooisand Desert Ranch / Chairperson Namib Farmers Club
Frank Wittneben	Namib Farmers Club
Windhoek Regional Council	

Notification Letter to Khomas Regional Council

061 299358 Marie Kandjengo
07/11/24

GEO Pollution Technologies
TEL.: (+264-61) 257411 ♦ FAX.: (+264) 88626368
CELL.: (+264-81) 1220082
PO BOX 11073 ♦ WINDHOEK ♦ NAMIBIA
E-MAIL: gpt@thenamib.com

To: **Interested and / or Affected Party / Neighbour** **01 November 2024**

Re: **ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN FOR EXCLUSIVE PROSPECTING LICENCE 8049, KHOMAS REGION**

Dear Sir/Madam

Geo Pollution Technologies (Pty) Ltd has been appointed by Votorantim Metals Namibia (Pty) Ltd to apply for an ECC for the proposed exploration activities related to EPL 8049. The ECC is required as per the Environmental Management Act No. 7 of 2007 (EMA). In support of the ECC application, an environmental scoping impact assessment (EIA) and environmental management plan (EMP) will be submitted to the Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs (DEA).

Project: Environmental Assessment and Management Plan for Exclusive Prospecting Licence 8049, Khomas Region

Proponent: Votorantim Metals Namibia (Pty) Ltd

Environmental Assessment Practitioner: Geo Pollution Technologies (Pty) Ltd

The Proponent received an "Intention to Grant" from the Ministry of Mines and Energy in respect of their application for exclusive prospecting licence (EPL) 8049 in the Khomas Region. The EPL will be granted to the Proponent upon successful acquisition of an environmental clearance certificate (ECC) for the EPL area, as indicated on Page 2. The EPL is for base and rare metals, industrial minerals and precious metals. Exploration may entail desktop studies, remote sensing, field surveys, soil and geochemical studies, geophysical surveys and exploration drilling.

Interested and affected parties or neighbours are invited to register with the environmental consultant to receive further documentation and communication regarding the project. Please register at:

Fax: 088-62-6368 or **E-Mail:** epl8049@thenamib.com.

Registration and preliminary comments should reach our offices by latest 11 November 2024.

Should you require any additional information please contact Geo Pollution Technologies at telephone 061-257411.

Sincerely,
Geo Pollution Technologies

André Faul
Environmental Practitioner

Background Information Document

ENVIRONMENTAL ASSESSMENT AND MANAGEMENT PLAN FOR EXCLUSIVE PROSPECTING LICENCE 8049, KHOMAS REGION

BACKGROUND INFORMATION DOCUMENT

Prepared by:

Prepared for:

September 2024

1 INTRODUCTION

Votorantim Metals Namibia (Pty) Ltd (the Proponent) received an "Intention to Grant" from the Ministry of Mines and Energy in respect of their application for exclusive prospecting licence (EPL) 8049 in the Khomas Region. The EPL will be granted to the Proponent upon successful acquisition of an environmental clearance certificate (ECC) for the EPL area, as indicated in Figure 1. The EPL is for base and rare metals, industrial minerals and precious metals.

The Proponent has requested Geo Pollution Technologies (Pty) Ltd (GPT) to apply for an ECC for the proposed exploration activities related to EPL 8049. The ECC is required as per the Environmental Management Act No. 7 of 2007 (EMA). In support of the ECC application, an environmental scoping impact assessment (EIA) and environmental management plan (EMP) will be submitted to the Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs (DEA).

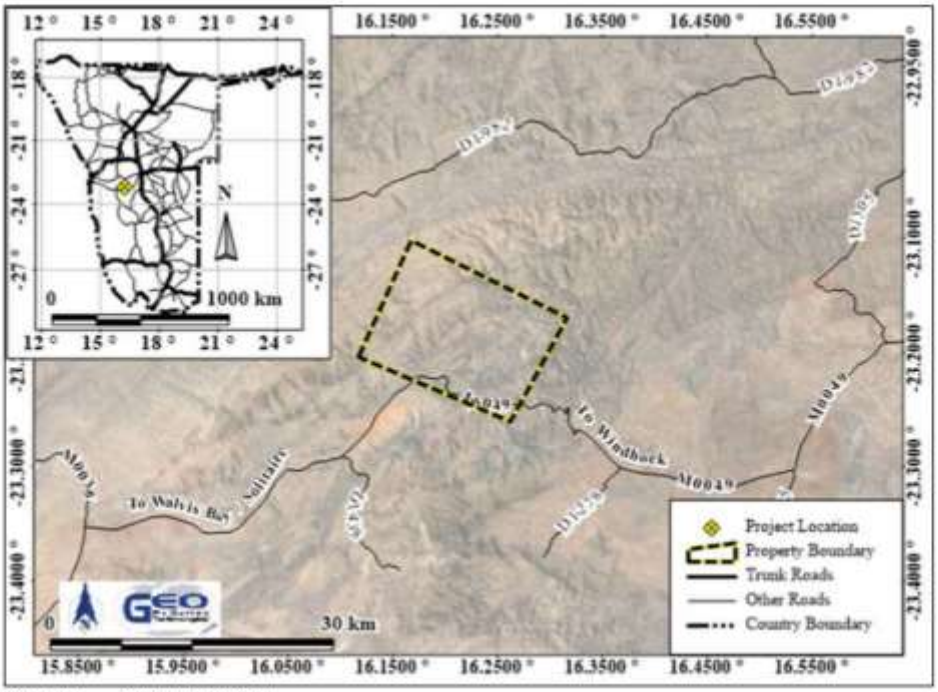

Figure 1 Project location

2 PURPOSE OF THE BID

With this background information document (BID), GPT aims to provide information to, and interact with, interested and affected parties (IAPs) regarding the project and the environmental assessment process. IAPs are therefore invited to register with GPT to:

- Provide information which should be taken into account in the assessment of impacts.
- Share any comments, issues or concerns related to the project.
- Review and comment on the EIA and EMP.

3 PROJECT DESCRIPTION

Activities considered for the environmental assessment have been divided into the following phases: planning, construction, operational and decommissioning phases. A brief outline of expected activities for each phase is detailed below.

3.1 PLANNING PHASE

Planning is ongoing and include planning for the various phases involved with the exploration activities. As part of the planning phase, it is the responsibility of Proponent to ensure they are and remain compliant with all legal requirements. The Proponent must also ensure that all required management measures are in place, prior to and during all phases, to ensure potential impacts and risk are minimised. Typical planning activities include:

- Obtain or renew permits, licences and approvals from all relevant local and national authorities. This includes the ECC and drilling authorisation from the Ministry of Agriculture, Water and Land Reform.
- Planning to meet the various conditions that may be prescribed by the MEFT as issued as part of the ECC.
- Liaison and reaching agreements with all land owners regarding access to their land.
- Make provisions to have a health, safety and environmental coordinator to implement the EMP.
- Ensure provisions for a fund to cater for restoration or rehabilitation activities in areas where exploration activities occurred, and for the eventuality of environmental incidents or pollution resulting from exploration activities.
- Ensure all appointed contractors and employees enter into an agreement with the Proponent which includes the EMP.
- In accordance with the ECC conditions, maintain a reporting system to report on the various management parameters as outlined in the EMP. This is a standard requirement of ECC conditions.

3.2 CONSTRUCTION PHASE

No major construction activities are required for exploration purposes. Construction activities pertain mainly to the establishment of access roads to specific areas targeted mainly for exploratory drilling, setting up temporary worker camps (if required), clearing and possibly levelling of drilling pads and associated laydown areas, and construction of temporary ablution facilities. Roads, camps and laydown areas will be created by bulldozer and/or manual labour, depending on the terrain and vegetation type and density.

3.3 OPERATIONAL PHASE

The operational phase encompass all operational activities performed within the EPL for purposes of exploring for the relevant commodities (base and rare metals, industrial minerals and precious metals). This include:

- Desktop studies: Review of existing geological literature and data for the area of interest.
- Remote sensing: Imagery and spectral data obtained from aerial surveys or satellites. Such data will be used to map geological characteristics and structures, with the aim of determining focus areas for more detailed exploration activities.
- Field surveys: Geological mapping of focus areas by visual confirmation of surface geology.
- Soil and geochemical sampling: Rock and soil collection and analysis to determine mineral content and thereby further refining the focus areas for exploration.
- Geophysical surveys: Surveys used to determine and map subsurface features without drilling. Various geophysical survey methods exist and include seismic, magnetic, electrical, electromagnetic and gravity methods. The Proponent will mainly use electrical (induced polarization and electrical resistivity tomography) and electromagnetic (audio-magneto telluric or electromagnetic sounding surveys) methods. These measure the electrical and electromagnetic properties of the subsurface to identify different materials and subsurface geology to refine focus areas. For both, survey lines need to be cleared to ensure unrestricted access for the equipment and cables.

- Exploratory drilling: Once sufficient information is gathered from the above methods, and focus areas for exploration have been determined, a drilling plan can be determined and executed. This constitutes the most invasive part of exploration. Drilling logs will be kept and drill chips or cores will be collected for analysis in order to determine ore reserves and resource feasibility.

When accessing the EPL for exploratory drilling, existing roads will be used as far as is practically possible to access drill targets. Where no roads exist, roads will be created in such a way as to minimise the impact and potential future erosion. The drill rig and its associated equipment such as compressors, drill rods, etc., will be mobilised to site. Water and fuel for drilling operations will be carted to the drill sites. Adequate temporary ablution and mess facilities will be provided to workers who will be present on site for extended periods (e.g. during drilling). All waste, including any polluted soil or water, will be collected for disposal at recognised waste disposal facilities. Where possible, sewage will also be collected and disposed of at a registered wastewater treatment facility. Sewage may also be disposed of in existing or newly constructed pit latrines, septic tanks or french drain systems on the farm, in agreement with the land owner. Daily operations further include administrative tasks, security services and procedures, site maintenance and related activities. Maintenance of access roads will continually be conducted and includes dust management if and when required.

3.4 Decommissioning Phase

Decommissioning during the exploration phase entails vacating exploration areas and removal of all equipment and infrastructure used by the Proponent or its contractors. All areas and roads will at such time be rehabilitated, or handed over to the land owner, in accordance with the agreements reached with the respective land owners prior to initiation of exploration activities. Rehabilitation may include shaping and/or ripping of roads, campsites, laydown and drilling areas to prevent erosion, allow rapid establishment of vegetation, and reduce the visual impact by contouring such areas to fit in with the natural topography of the land. Any pollution (e.g. fuel. oil, hydraulic fluid) as well as all drilling cores and cuttings present on and around explorations sites must be removed at such time. Drill cuttings can also be used for beneficial purposes (e.g. road surfacing, backfilling erosion ditches, etc.) in agreement with the land owner. Any potential hazardous cuttings should however be identified and removed accordingly.

3.5 Preliminary Identified Impacts

During the preparation of the environmental assessment, all components of the environment will be considered. However, only those components which are, or may be, significantly impacted, or are deemed to be sensitive, will be assessed. These may include, but is not limited to, the following:

- Social (demographic profile, employment, social ills, etc.)
- Security (theft, unauthorised access, etc.)
- Economic (wages, procurement, taxes, etc.)
- Waste (general, sewage, hazardous, etc.)
- Soil and water (groundwater, surface water and soil pollution, erosion, compaction)
- Ecology (habitat loss, poaching, protected species)
- Health and safety (injuries, exposure, noise, etc.)
- Visual (erosion, scarring, pollution)
- Heritage and archaeology (historic artefacts, paleontological finds, etc.)

4 PUBLIC CONSULTATION

GPT invites all IAPs to provide in writing, any issues and suggestions regarding the project. This correspondence must include:

- Name and surname
- Organisation represented or private interest
- Position in the organization
- Contact details

- Any direct business, financial, personal or other interest which you may have in the approval or refusal of the application.

All contributions become public knowledge and will be circulated along with the reports as per the EMA requirements. The comments, inputs and suggestions will also be submitted to the DEA along with how any issues have been addressed in the EIA. The public participation process will remain ongoing during the environmental assessment. However, all comments and concerns should timeously be provided to GPT to ensure incorporation into the final report. For any additional information the project team may be contacted at:

Geo Pollution Technologies (Pty) Ltd
Telephone: (+264-61) 257411
Fax: (+264) 88626368
e-mail: epl8049@gpt.com

Your Rights as an IAP according to the Environmental Management Act, No7 of 2007, Government Notice No 30 (Environmental Impact Assessment Regulations)

Section 23.

(1) A registered interested or affected party is entitled to comment in writing, on all written submissions made to the Environmental Commissioner by the applicant responsible for the application, and to bring to the attention of the Environmental Commissioner any issues which that party, believes may be of significance to the consideration of the application, as long as -

(a) comments are submitted within 7 days of notification of an application or receiving access to a scoping report or an assessment report;

(b) the interested and affected party discloses any direct business, financial, personal or other interest which that party may have in the approval or refusal of the application.

(2) Before the applicant submits a report compiled in terms of these regulations to the Environmental Commissioner, the applicant must give registered interested and affected parties access to, and an opportunity to comment in writing on the report.

(3) Reports referred to in sub regulation (2) include

(a) scoping reports;
(b) scoping reports amended and resubmitted;
(c) assessment reports; and
(d) assessment reports amended and resubmitted.

(4) Any written comments received by the applicant from a registered interested or affected party must accompany the report when the report is submitted to the Environmental Commissioner.

(5) A registered interested or affected party may comment on any final report that is submitted by a specialist reviewer for the purposes of these regulations where the report contains substantive information which has not previously been made available to a registered interested or affected party.

Section 24:

The applicant responsible for an application must ensure that the comments of interested and affected parties are recorded in reports submitted to the Environmental Commissioner in terms of these regulations, and comments by interested and affected parties on a report which is to be submitted to the Environmental Commissioner may be attached to the report without recording those comments in the report itself.

Press Notice: Namibian Sun 11 and 18 September 2024

Sun
WEDNESDAY 11 SEPTEMBER 2024
NEWS
5

• ANDRADA ENTERS INTO PARTNERSHIP WITH SQM

Lithium: Big players get involved in Uis

Andrada Mining believes its new **partnership with lithium giant SQM will accelerate exploration.**

AUGETTO GRAIG
WINDHOEK

Uis's Andrada Mining Limited announced this week that the company has formed a partnership with one of the world leaders in the lithium industry.

The partnership is with Sociedad Química y Minera de Chile SA (SQM), and the agreement includes three phases through which SQM can earn an increasingly larger stake in the development of the Lithium Ridge's lithium deposit on mining license ML133.

"Becoming a major player in the global lithium market will also place Namibia at the forefront of lithium development trajectories in Africa and unlock value for the Namibian mining industry,' said Anthony Viljoen, CEO of Andrada.

According to Mark Fones, SQM's CEO for its international lithium division, the Chilean lithium giant is pleased to begin exploration work with a proven partner like Andrada Mining.

"We are excited to announce the completion of this agreement, which demonstrates our commitment to finding the best lithium assets worldwide and effectively diversifying our portfolio."

"Namibia is among the top mining jurisdictions in the region," he said.

HOPEFUL: Andrada Mining believes its new partnership with lithium giant SQM will accelerate exploration. PHOTOS ANDRADA MINING

INSPECTION: Vice-President Netumbo Nandi-Ndaitwah and Chamber of Mines CEO Veston Malango examine Andrada's Uis mineral products at this year's mining expo. PHOTO: AUGETTO GRAIG

Exploration and development

In August, Andrada acquired the remaining 15% stake in Uis Tin Mining Company Limited (UTMC) from Small Miners of Uis (SMU), and with this latest agreement, UTMC will establish a new subsidiary, Grace Simba Investments (GSI), to retain the rights to the Lithium Ridge.

According to Andrada, the SQM agreement brings the necessary financial and technical capability to properly explore and develop the deposit. SQM will be required to fund the necessary exploration and, at a later stage, a feasibility study according to the agreement.

With the signing of the agreement, SQM paid Andrada US$500 000 (almost N$9 million), with an additional US$1.5 million payable upon meeting certain requirements. Furthermore, SQM can invest up to US$20 million over three and a half years to acquire 40% of GSI, and with financing of the feasibility study, SQM will also earn 50% of the development.

If Andrada can prove that the deposit contains more than 40 million tonnes of lithium ore, SQM will pay an additional lump sum based on the percentage of lithium in the ore.

'Ideal partners'

'We are incredibly pleased to announce our partnership with SQM and to be part of SQM's first African partnership. This partnership strengthens our belief in the Lithium Ridge asset as a potential world-class resource,' Viljoen said.

He added that the partnership also enhances the value of Andrada's overall asset portfolio.

"SQM is the ideal partner to unlock the full potential of Lithium Ridge while enabling the continued development of Uis through our existing financing relationships.

"The SQM partnership aligns perfectly with our strategic goals, allowing us to develop our lithium assets and accelerate exploration initiatives," said Viljoen.

Lithium Ridge spans approximately 3 300 hectares and is located about 35 km from Andrada's existing mine at Uis. A six-kilometre area of high-grade lithium has already been discovered.

The agreement is still subject to approval by the Namibian Competition Commission.

Unauthorised Windhoek taxis urged to register

STAFF REPORTER
WINDHOEK

The Windhoek City Police says it has noted with concern the increasing number of unauthorised public transport operators in the city.

In a media statement, the police said that investigations revealed that numerous operators transport passengers without the proper authorisation, including shuttles to and from the airport and those operating via digital applications.

In light of this, the City of Windhoek, which regulates public transportation, urged public motor vehicle owners who transport passengers for payment to register with the City Police to obtain the necessary authorisation.

"At the moment, the City has over five thousand registered public motor vehicles [taxis] thanks to the ease and affordability of registration," the statement said.

"To register a public motor vehicle, one must have a transportation permit indicating its operational areas as per Section 31 (1)(a) of the Road Transportation Act of 1977. According to Regulation 284 of the Road Traffic and Transport Regulations published under Government Notice 53 of 2001, an operator must be identified and registered if they convey passengers for reward."

Legal

The police explained that once all requirements are met, vehicles undergo thorough inspections by authorised officers to determine their roadworthiness. "Upon passing inspection, a registration certificate, or blue paper, is issued to the operator. This certificate authorises a taxi to operate within the city, as regulated by Regulation 94."

This document costs N$60 and has to be renewed every six months.

To avoid a fine of N$1 000 or their operations being halted, public vehicle owners or drivers are urged to follow the registration process.

For more information, potential operators can visit the Windhoek City Police headquarters or call 061 302 302.

DO THE RIGHT THING: Unauthorised taxis in Windhoek have been urged to register their operations. PHOTO: FILE

• ANDRADA ENTERS INTO PARTNERSHIP WITH SQM

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DO THE RIGHT THING: Unauthorised taxis in Windhoek have been urged to register their operations. PHOTO: FILE

PUBLIC PARTICIPATION NOTICE
ENVIRONMENTAL ASSESSMENT: EXCLUSIVE PROSPECTING LICENCE 8048 AND 8049

Geo Pollution Technologies (Pty) Ltd (GPT) has been appointed by Vanguarium Metals Namibia (Pty) Ltd (the Proponent), to undertake environmental assessments for proposed exploration activities related to exclusive prospecting licence (EPL) areas 8048 and 8049, Khomas Region. The EPLs will be granted to the Proponent upon successful acquisition of environmental clearance certificates (ECC) for the EPL areas. The EPLs are for base, rare and precious metals and industrial minerals. Additional information can be obtained at:
http://www.thenamib.com/projects/projects.html

The assessments will be conducted according to the Environmental Management Act of 2007 and its regulations of 2012. Interested and affected parties are invited to register with GPT for the opportunity to share comments, issues or concerns related to the projects, for consideration in the assessments. Registrations, information requests, comments and concerns should be submitted to GPT by 1 Oct 2024.

André Faul
Geo Pollution Technologies
Tel: +264-61-257411
Fax: +264-88620368
E-Mail: ems@thenamib.com

Press Notice: Republikein 11 and 18 September 2024

2 NUUS Republikein Woensdag 11 September 2024

KONTAKPERSONE

NUUSREDAKTEUR
Henriette Lamprecht
081 350 3801 /
061 297 2000
henriette@republikein.com.na

GENL. MURTALA MUHAMMEDRYLAAN. POSBUS 3436, WINDHOEK
TEL: 061 297 2000 | VOLG ONS OP:
ISSN 1560-9448

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Gebruik die kode om aan die daaglikse kompetisie in Sport Wrap deel te neem.
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WEER

BINNELAND: Gedeeltelik bewolk en warm tot baie warm in die noorde. Elders sonnig en warm tot baie warm.

KUS: Gedeeltelik bewolk en koel met mis-kolle.

GETYE BY WALVISBAAI: H: 08:07 L: 13:53 H: 20:36

VOORUITSIGTE

WINDHOEK	12°	29°
RUNDU	14°	35°
OSHAKATI	15°	35°
GOBABIS	14°	35°
MARIENTAL	10°	29°
KEETMANSHOOP	10°	29°
WALVISBAAI	9°	19°
LUANDA	20°	27°
JOHANNESBURG	11°	25°
KAAPSTAD	8°	22°

'Geen gunste vir gawes'

VAN BL. 1

"Jy hoor geen haan hieroor kraai nie, maar in ons geval word ons daarvan beskuldig dat ons demokrasie verkoop. Dit moet stop. Is dit omdat ons Afrikane is? Dit is nie regverdig nie," het 'n sigbaar geïrriteerde Nandi-Ndaitwah gesê.

Ná die Fishrot-skandaal waarin verskeie Swapo-weldoeners in 2019 weens beweerde korrupsie-aanklagte gearresteer is, het die party 'n rits veranderings aangebring aan die manier waarop Swapo skenkings aanvra en ontvang.

REGULASIES

Die Verkiesingskommissie van Namibië (ECN) het destyds regulasies gepubliseer oor die maksimum drempel van geld wat partye van Namibiërs, plaaslike firmas, buitelanders en buitelandse maatskappye kan ontvang voordat hulle gedwing word om hierdie bedrae via die media bekend te maak.

Die destydse party-president, wyle dr. Hage Geingob, het toe aangekondig dat Swapo 'n interne proses van hersiening, hervorming en ondersoek na vorige skenkings onderneem.

Hy het met onmiddellike effek beveel dat geen Swapo-lid of simpatiseerder moet poog om skenkings van enige voornemende skenker – plaaslik of internasionaal – te werf sonder die magtiging van die kantoor van die sekretaris-generaal nie.

Geingob het ook opdrag gegee dat geen Swapo-lid of ampsdraer namens die party skenkings van enige bron – plaaslik of internasionaal – mag aanvaar sonder om magtiging van die party se sekretaris vir finansies en ekonomiese aangeleenthede, in oorleg met die sekretaris-generaal (SG), te verkry nie.

'n Ander regulasie het verplig dat enige persoon of instansie wat op versoek of op 'n vrywillige basis van voorneme is om 'n skenking aan en tot voordeel van Swapo of sy ampsdraers te maak, dit in oorleg moet doen deur die kantoor van die party se sekretaris vir finansies en ekonomiese aangeleenthede en die SG.

Geingob het gesê Swapo gaan 'n sentrale owerheid, verkieslik sy sekretaris vir finansies en ekonomiese sake, aanstel om skenkings wat aan die party gemaak is, te aanvaar en te registreer. Dit sal hulle in staat stel om interne omsigtigheidsprosedures uit te voer voor die formele aanvaarding van 'n bepaalde politieke skenking en om skenkings wat die voorgeskrewe drempels oorskry, in die openbaar bekend te maak.

Public Participation Notice
Environmental Assessment: Exclusive Prospecting Licence 8048 and 8049

Geo Pollution Technologies (Pty) Ltd (GPT) has been appointed by Votorantim Metals Namibia (Pty) Ltd (the Proponent), to undertake environmental assessments for proposed exploration activities related to exclusive prospecting licence (EPL) areas 8048 and 8049, Khomas Region. The EPLs will be granted to the Proponent upon successful acquisition of environmental clearance certificates (ECC) for the EPL areas. The EPLs are for base, rare and precious metals and industrial minerals. Additional information can be obtained at:
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André Faul
Geo Pollution Technologies
Tel: +264-61-257411
Fax: +264-88626368
E-Mail: venn@thenamib.com

GEO Pollution Technologies

» **Goewerneur spreek** sy kommer uit

Verkragting van minderjariges 'n kopseer in Oshikotostreek

Verkragtingsake het gedurende die laaste kwartaal van die boekjaar onder hersiening met 58% afgeneem, asook selfdoodgevalle met 21% en veediefstal met 53%.

Kenya Kambowe

Die Oshikoto-goewerneur het sy kommer uitgespreek oor ouers, voogde en bure wat minderjariges in die streek verkrag en sê dat daar van hulle verwag word om die kinders te beskerm en hulle nie leed aan te doen nie.

Penda ya Ndakolo het tydens sy onlangse streekrede gesê ondanks die misdaadstatistieke wat 'n afname toon in vergelyking met dié van verlede jaar, is dit ontstellend dat geslagsgebaseerde geweld (GBV) teenoor kinders gepleeg word deur diegene wat met hul veiligheid toevertrou is.

"Dit is goed om te sien dat verkragtingsake gedurende die laaste kwartaal van die boekjaar onder hersiening met 58% afgeneem het, selfdoodgevalle met 21%, terwyl veediefstal ook met 53% gedaal het, vergeleke met dieselfde kwartaal van die vorige boekjaar," het Ya Ndakolo gesê.

"Hoewel dit 'n positiewe ontwikkeling is, bly die kommer dat die meeste van die GBV-sake soos verkragting teen minderjariges gepleeg word deur die mense wat veronderstel is om vir daardie kinders te sorg.

"Die oortreders van GBV is meestal familielede, voogde en bure. Dit is inderdaad ontstellend.

"Daarom herhaal ek dat ons almal ons pogings moet verdubbel om misdaad te bekamp. Kom ons gebruik verskeie middele soos opvoeding en bewusmakingsveldtogte in skole en ander openbare plekke.

"Die belangrikste is egter dat ons daarna streef om ons kinders tuis op die regte manier groot te maak. Wanneer die kinders op 'n korrekte manier grootgemaak word, sal hulle vir seker tot verantwoordelike lede van die samelewing groei."

Die Oshikoto-goewerneur, Penda ya Ndakolo. FOTO ARGIEF

Oshikoto het in 2018 die hoogste aantal verkragtingsmisdade wat teen minderjariges gepleeg is, aangeteken. Dié syfer het op 39 gestaan.

Republikein se susterkoerant *Namibian Sun* het in Januarie berig oor hoe die polisie in die Oshikotostreek 'n saak ondersoek waarin 'n 39-jarige man daarvan beskuldig word dat hy sy tienerdogter by sy huis in die Onyaanya-kiesafdeling verkrag het.

Die 15-jarige meisie het haar pa gaan besoek, wat haar na bewering daardie aand verkrag het. Die voorval het glo in Oktober verlede jaar plaasgevind.

In Maart het die Oshikoto-polisie weer 'n saak ondersoek van 'n tienjarige meisie wat na bewering deur haar 43-jarige biologiese pa verkrag is. Die voorval het glo by die Uuholamo-nedersetting in die Okankolo-kiesafdeling plaasgevind.

Destyds het die polisieondersoeke daarop gedui dat die verdagte die meisie die middag ná skool in die slaapkamer gevind en haar glo verkrag het.

Dit is maar een van die talle sake wat oor die jare by die Oshikoto-polisie aangemeld is.

– republikein@republikein.com.na

Skrywers delf diep in Namibië se geskiedenis

VAN BL. 1

Die boek, wat gebaseer is op mondelingse navorsing, ontleed die ontasbare stelsels wat kontrakwerkers bygehou het, insluitend waarnemings van sterftes in die werksplek. Die boek handel breedweg oor die praktyke wat gemeenskappe in tye van stres bymekaar gehou het (toe trekarbeiders ver van die huis af gewerk het) en hoe hierdie werkers aangepas het by stelsels wat met kolonialisme gekom het, soos die posstelsel.

Nampala is tans die skoolhoof van die Gekombineerde Skool Uukelo in die Ohangwenastreek. Sy het 'n doktorsgraad in geskiedenis aan die Universiteit van Wes-Kaapland verwerf met haar tesis waaruit die boek bestaan. Die boek word vanaand by die nasionale biblioteek bekend gestel.

'BEDELAARS IN ONS EIE LAND'

Dr. Willem Odendaal se *Beggars on our own land*. . . word eerskomende Dinsdag by die Wetenskaplike Vereniging van Namibië bekend gestel.

Die boek handel oor die uitsetting van die Hai||om uit die Etosha Nasionale Park in 1954 onder Suid-Afrikaanse administrasie.

Die Hai||om het in 2015 'n aansoek in die hoërhof gebring. Die vraag oor die regsprosedure wat die Hai||om kan volg om Namibië se howe te nader om vergoeding te eis, is die spilpunt van hierdie boek.

Odendaal kyk onder meer na die tekortkominge met betrekking tot geskiedkundige grondonteiening in Namibië se plan vir grondhervorming en bevind dat Namibië se wetlike raamwerk beperkend en verouderd is en dat dit 'n rol in die Hai||om se aansoek in die hoërhof gespeel het.

Odendaal het 'n doktorsgraad in regte van die Universiteit van Strathclyde in Glasgow, Skotland, en werk tans saam met plaaslike gemeenskappe in Namibië oor kwessies verwant aan mense-, grond- en omgewingsregte.

– republikein@republikein.com.na

Tronkstraf bring nie ons pa terug, sê dogter

VAN BL. 1

Die landdros het Clemens ook gekritiseer omdat hy as ouer misluk het en daarop gewys dat hy sy seun moes aangeraai het om hom nie tot geweld te wend nie.

Die tragiese verlies van Mutonga, het hy gesê, het 'n blywende leemte gelaat – nie net in sy familie nie, maar ook in die gemeenskap.

"Die leemte wat die oorledene gelaat het, veral in die lewens van sy jong kinders, kan nooit gevul word nie," het Mufana bygevoeg.

Felicia het gesê dat haar familie verlig is ná die lang regsproses.

"Dit was 'n lang vyf jaar van hofgevegte om uiteindelik geregtigheid te kry. Die manier waarop die landdros en staatsaanklaer die saak hanteer het, was baie sensitief, waarvoor ons as 'n familie opreg dankbaar is. Hulle het alle aspekte van hoe die gebeure ontvou het, noukeurig oorweeg.

"Ons is baie tevrede met hoe die landdros die saak hanteer en die uitspraak met soveel sensitiwiteit gelewer het. Die twee hoofbeskuldigdes is tot 18 jaar tronkstraf gevonnis, plus 'n bykomende twee jaar vir die onwettige besit van vuurwapens, wat dit altesaam 20 jaar maak. Aangesien hulle reeds vyf jaar sedert 2019 agter tralies was, het die landdros besluit om nie daardie tyd op te skort nie," het sy dogter verduidelik.

"As 'n familie is ons ook dankbaar vir die staatsaanklaer, wat ons bygestaan en onvermoeid geveg het om te verseker dat ons die geregtigheid kry wat ons verdien.

"Dit was 'n moeilike vyf jaar van in en uit die hof en die teistering wat ons van die oortreders se familie moes verduur het, maar op die ou einde het ons die geregtigheid gekry wat ons gesoek het," het Felicia bygevoeg.

ONDERSOEK

In Augustus 2019 het 'n plaaslike Engelse dagblad berig dat Mutonga se familie hul ontevredenheid uitgespreek het oor die polisie se ondersoek na sy dood.

In 'n brief aan die Namibiese polisie se inspekteur-generaal Sebastian Ndeitunga destyds, het die familie gesê hulle het vertroue verloor in die ondersoekbeamptes van Katima Mulilo wat deur adjunk-kommissaris Evans Simasiku gelei is.

"Ons het vertroue in die hele misdaadondersoekafdeling van die Namibiese polisie by Katima Mulilo verloor, en ons eis dat die moordsaak van Lemmy Mutonga deur beamptes van 'n ander streek ondersoek word. Die hele ondersoekspan moet verwyder en ondersoek word," het die brief gelui.

Die familie het verskeie ongerymdhede, onbevoegdheid en nalatigheid in die bewaring van bewysstukke tydens die polisie-ondersoek uitgelig.

"Die klere wat Mutonga gedra het die dag toe hy geskiet is, is nie deur die polisie vir forensiese ontleding afgehaal nie. In plaas daarvan, is die bloedbevlekte klere aan sy ma terugbesorg," het die familie destyds beweer.

– republikein@republikein.com.na

» Onderhandelinge glo nog aan die gang

Reparasiedokumente 'verdwyn in die niet'

Die ministerie van internasionale betrekkinge en samewerking verduidelik sommige dokumente kan nie opgespoor word nie en ander moet nog opgestel word.

Jemina Beukes

Dokumente, insluitend notules van vergaderings tussen Namibiese en Duitse tegniese komitees, het glo verdwyn.

Dit het onlangs aan die lig gekom in 'n saak in die hoërhof wat Bernadus Swartbooi, die Landless People's Movement (LPM) en 11 tradisionele owerhede teen die regering aanhangig gemaak het.

Die hofaansoek poog om die omstrede gesamentlike verklaring tussen Namibië en Duitsland – waarin die Duitse regering ingestem het om Namibië 1,1 miljard euro (N$18,6 miljard) aan projekte oor 30 jaar te betaal vir die versoening en heropbou van geraakte gemeenskappe van die Nama-Herero-volksmoord van 1904 tot 1908 – nietig te verklaar.

Volgens regeringsverteenwoordigers sluit die vermiste dokumente ook 'n opdrag aan die spesiale politieke kabinetskomitee deur die tegniese komitee op 24 Maart 2022 in asook notules van verskeie spesiale kabinetskomiteevergaderings.

Hulle het ook aan die hof gesê die addendum, finansieringsooreenkoms, die konsepraamwerk vir 'n spesialedoelvoertuig en die gesamentlike konsepverklaring met wysigings word nog deur die twee regerings onderhandel.

Penda Naanda, die uitvoerende direkteur van internasionale betrekkinge en samewerking, het in sy beëdigde verklaring gesê dié dokumente wat nie weg is nie, word steeds deur verteenwoordigers van die Namibiese en Duitse regerings opgestel.

Sommige van die dokumente wat met die onderhandelinge verband hou, is ook onderhewig aan prokureur-kliënt-privilegie.

Penda Naanda
UITVOERENDE DIREKTEUR

"Sommige dokumente kan nie opgespoor word nie ten spyte van 'n ywerige soektog daarna."

"Sommige dokumente kan nie opgespoor word nie ten spyte van 'n ywerige soektog daarna. Sommige dokumente word nog voorberei," het Naanda gesê.

Naanda het Swartbooi en die tradisionele leiers daarvan beskuldig dat hulle nie in goeder trou opgetree het deur dokumente te eis wat nog nie deur die twee regerings onderhandel is nie en daardeur glo ook die onderhandeling belemmer.

Swartbooi en die tradisionele leiers het in reaksie by monde van hul regsverteenwoordiger, Patrick Kauta, gesê dit is onmoontlik om te glo dat van die dokumente nog in konsepvorm is of nog onderhandel word.

Hy het ook daarop gewys dat hulle geregtig is op alle dokumente wat aan die besluitnemers voorgelê is en waarop staatgemaak sou word om die besluite te neem.

"Dit is moeilik om te dink dat enigiets op die oomblik nog onderhandel kan word, aangesien die Namibiese en Duitse regerings kennis gegee het van die gesamentlike verklaring.

"Die gesamentlike verklaring kon nie aanvaar word sonder dat die onderhandelinge wat tot die aanvaarding van die gesamentlike verklaring gelei het, afgehandel is nie."

Die vermiste dokumente sluit in ondertekende, behoorlik gedateerde en goedgekeurde notules van die vergadering tussen die Namibiese en Duitse tegniese komitees by Midgard Lodge vanaf 9 tot 11 Maart 2022.

'n Afskrif van die addendum wat die inlywing van die voorgestelde veranderinge en wysigings deur die prokureur-generaal bewys, is ook nog soek.

Hulle soek ook nog die goedgekeurde notules van beide die raadplegende komiteevergadering van belanghebbendes op 4 tot 6 Oktober 2023, 'n afskrif van die konseptfinansieringsooreenkoms asook 'n afskrif van die addendum en finansieringsooreenkoms.

Penda Naanda, die uitvoerende direkteur van internasionale betrekking en samewerking. FOTO ARGIEF

Hof besluit binnekort oor Maree se bekentenis

Kristien Kruger

Hoewel die publiek nie toegelaat word om die hofverrigtinge van die vermeende pedofiel, Johann Maree, by te woon nie, is inligting van die hof ontvang dat 'n binneverhoor vandeesweek afgehandel is.

Die binneverhoor handel oor die toelaatbaarheid van 'n bekentenis wat Maree glo afgelê het ná sy arrestasie in April 2020. Hy beweer nou dat sy die bekentenis onder dwang afgelê het.

Tydens Maree se aansoek om borgtog sowat drie jaar gelede, het die staatsaanklaer, Like Phelem, dele van dié bekentenis in die landdroshof in Windhoek voorgelees.

Maree het daarin skuld erken en verduidelik wat hy aan elkeen van die minderjarige slagoffers gedoen het. Hy het ook destyds die bekentenis onderteken.

Hy het wel reeds tydens hierdie borgtogverrigtinge aangevoer dat hy gedwing was om die bekentenis af te lê.

Volgens 'n hofklerk is die binneverhoor Maandag afgehandel en is die saak tot 4 Oktober uitgestel vir die lewering van die uitspraak. Die hof sal beslis of die bekentenis tydens die verhoor as bewysstuk toegelaat sal word.

Johann Maree FOTO KRISTIEN KRUGER

AGTERGROND

Maree word daarvan beskuldig dat hy tientalle minderjarige seuns in Windhoek verkrag en seksueel misbruik het. Hy het na bewering ook kinderpornografie vervaardig en dit op die donker web versprei.

Ingevolge die hof se instruksie, mag die publiek en media nie die verhoor bywoon nie om sodoende die identiteit van die slagoffers te beskerm.

Maree se verhoor word deur die hoërhof in Windhoek hanteer en deur regter Philanda Christiaan aangehoor.

IAP Comments

Email Received: From Seef Stepelberg, Land Owner in EPL Area
Date Received: 12 December 2024

Comment	Response
Photo 5-9 Borehole 5.8 GENERAL Prior to any access to the EPL area, surface access agreements will be negotiated and signed with the land owners. Such agreements will clearly stipulate the landowners' requirements, expectations and compensation. The first agreement will cover activities up to geophysical surveys and geochemical sampling. Should a target site for core drilling be identified, a new agreement will be reached with the land owner. Four wheel drive vehicles, numbered and marked as being the property of the Proponent, will be used to transport staff to the site and back. Access to target areas on the farm will at all times be via existing roads, or where no roads are present, roads will be made as per agreements reached with land owners. Such roads will preferably be made by means of manual labour in order to EPL 8049 - EIA & EMP - Nov 2024 Geo Pollution Technologies (Pty) Ltd	All negotiations between the landowner and the Proponent will take place once the EPL is granted to the Proponent, and exploration is planned for the specific farm. Such negotiations will be included in the surface access agreement.
9 km west of the EPL. *Implications and Impacts* Access to exploration areas will be difficult due to the rugged and mountainous terrain, where no existing roads are present. Even moving of large vehicles such as drill rigs to the EPL area will require cognisance of the steep Gamsberg Pass. If new roads are created to gain access to particular areas of the EPL, or if drill pads are cleared, erosion can occur during heavy rainfall events. If such roads and drill pads are not suitably rehabilitated, erosion may be a long term problem.	Corrected
Implications and Impacts A significant portion of Namibia's protected tree and plant species occur within the EPL boundaries. These, together with bird nests they (and other trees) may contain, may be damaged during exploration activities. Poaching of wildlife is a concern. Encounters with venomous or dangerous animals (e.g. leopard, rabid animals, etc.) may pose a danger to the Proponent's staff. 8.8 DEMOGRAPHIC AND ECONOMIC CHARACTERISTICS The project is located in the western area of the Windhoek District and Khomas Region, and falls	Changed to "Encounters with venomous (mambas, puff adders, zebra snakes, scorpions) or dangerous animals…."
The EPL is relatively remote from commercial centres with Windhoek reachable by 150 km and Walvis Bay by 200 km of gravel roads. Solitaire, 110 km away by road, has the nearest small shop, fuel retail facility with tyre repair service, and restaurant / take-away. Farms surrounding the EPL that has hospitality and accommodation facilities are, among others, Rooisand Desert Ranch on farm Chausib, Hakos Astro Guest Farm on Farm Groot Hakos, Corona Guest Farm on Farm Corona and Camp Rooiklip on Farm Rooiklip. Of these, both Rooisand Desert Ranch and Hakos Astro and Guest Farm have observatories. Stargazing is offered to guests and remotely operated observatories of international astronomers are located on Farm Chausib. It is specifically the dark and clear (unpolluted) night sky in this area presenting an ideal location for astronomy. *Implications and Impacts* There are no settlements in or near the EPL area. Thus, although unemployment and poverty in the Khomas Region is relatively high, there will be no job seekers in the area, apart from possibly	Added
refers to the presence of bright lighting in the area illuminating the skies and thus reducing visibility. This too, is more linked to potential future mining than the exploration phase per se. **Loss of farmland:** This concern is also linked to potential future mining. The concern is that farming and mining cannot co-exist and should a mine realise, the farm will no longer be a viable farming unit. 10 IMPACT ASSESSMENT AND MANGEMENT OF IMPACTS The purpose of this section is to identify and assess the most pertinent environmental impacts that are	The IAP's concern regarding this matter is noted and was communicated to the Proponent.
consequences of non-compliance, etc. *10.1.1.6 Rehabilitation and Pollution Clean-up* ♦ If not already established, establish and maintain a fund/insurance for rehabilitation of the exploration sites, or for unforeseen events where environmental pollution occur which requires clean-up and/or remediation. *10.1.1.7 Community Liaison* ♦ Appoint a community liaison officer and devise a community liaison strategy.	See above
(MSDS) and SANS instructions and all spills or leaks are cleaned up immediately. ○ Have serviced firefighting equipment within easy reach, including those used to fight veld fires. ○ Fire used for purposes such as cooking must only be allowed within designated areas far removed from any flammable material such as dry vegetation. **Mitigation:** ♦ Implement the fire protection and firefighting plan in the event of a fire.	Such aspects can be stipulated in the surface access agreement.

Possible ? Drilling of exploration holes may penetrate a confining aquifer layer (aquitard). This may cause mixing of aquifer water where the one aquifer may contain water of a poor quality, causing contamination of the aquifer having better quality. An alternative impact may be the leaking of water from one aquifer into another, causing existing boreholes to dry up or springs to dry up. Based on the limited amount of information available, it is not expected that such impacts would occur within the project area. It would however be advisable to take care during drilling that proper monitoring is taking place to evaluate for such conditions and that appropriate remedial actions be implemented where needed – the precautionary principal should be applied.	Based on existing information it is not likely to happen. A reputable drilling contractor should however be used, who can take the necessary steps to safeguard groundwater, should this scenario arise.

Site Notice 1

Site Notice 2

Appendix C: Consultant's Curriculum Vitae

ENVIRONMENTAL SCIENTIST **André Faul**

André entered the environmental assessment profession at the beginning of 2013 and since then has worked on more than 235 environmental impact assessments including assessments of the petroleum industry, harbour expansions, irrigation schemes, township establishment and power generation and transmission. André's post graduate studies focussed on zoological and ecological sciences and he holds a M.Sc. in Conservation Ecology and a Ph.D. in Medical Bioscience. His expertise is in ecotoxicological related studies focussing specifically on endocrine disrupting chemicals. His Ph.D. thesis title was The Assessment of Namibian Water Resources for Endocrine Disruptors. Before joining the environmental assessment profession he worked for 12 years in the Environmental Section of the Department of Biological Sciences at the University of Namibia, first as laboratory technician and then as lecturer in biological and ecological sciences.

CURRICULUM VITAE ANDRÉ FAUL

Name of Firm	:	Geo Pollution Technologies (Pty) Ltd.
Name of Staff	:	ANDRÉ FAUL
Profession	:	Environmental Scientist
Years' Experience	:	23
Nationality	:	Namibian
Position	:	Environmental Scientist
Specialisation	:	Environmental Toxicology
Languages	:	Afrikaans – speaking, reading, writing – excellent
		English – speaking, reading, writing – excellent

EDUCATION AND PROFESSIONAL STATUS:

B.Sc. Zoology	:	University of Stellenbosch, 1999
B.Sc. (Hons.) Zoology	:	University of Stellenbosch, 2000
M.Sc. (Conservation Ecology)	:	University of Stellenbosch, 2005
Ph.D. (Medical Bioscience)	:	University of the Western Cape, 2018

First Aid Class A	EMTSS, 2017; OHS-Med 2022
Basic Fire Fighting	EMTSS, 2017; OHS-Med 2022

PROFESSIONAL SOCIETY AFFILIATION:

Environmental Assessment Professionals of Namibia (Practitioner)

AREAS OF EXPERTISE:

Knowledge and expertise in:

- Environmental Assessment and Environmental Management Plans
- Water Sampling, Extractions and Analysis
- Biomonitoring and Bioassays
- Biodiversity Assessment
- Toxicology
- Restoration Ecology

EMPLOYMENT:

2013-Date	:	Geo Pollution Technologies – Environmental Scientist
2005-2012	:	Lecturer, University of Namibia
2001-2004	:	Laboratory Technician, University of Namibia

PUBLICATIONS:

Publications:	5
Contract Reports	+235
Research Reports & Manuals:	5
Conference Presentations:	1