

**Environmental & Social Impact Assessment: - For
The For Exclusive Prospecting License No. 8024 In
Arandis, Erongo Region - Namibia.**




Environmental Scoping Report (ESR)

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Client	Parkland Energy Resources Pty LTD P.O.BOX 81554, Olympia, Windhoek		
Lead Consultant	EnviroPlan Consulting Cc Enquiries: Mr. T E. Kasinganeti Tel: +264813634904 E-Mail: tendai@enviroplanconsult.com		 <small>...innovative planning for sustainability</small>
Date Of Release	May 23		
	Name	Signature	Date
Author/s	Tendai E. Kasinganeti		17 March 23
	Kristian NN Shiwayu		17 March 23

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ACRONYMS

TERMS	DEFINITION
BID	Background Information Document
DR	District Road
EAP	Environmental Assessment Practitioners
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EPL	Exclusive Prospecting license
GHGs	Greenhouse Gasses
HAIA	Heritage and Archaeological impact Assessment
ISO	International Organization for Standardization
I&Aps	Interested and Affected Parties
MEFT: DEAF	Ministry of Environment, Forestry and Tourism's Directorate of Environmental Affairs and Forestry
NHC	National Heritage Council
NEMA	Namibia Environmental Management Act
RA	Roads Authority
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change

DEFINITION OF TERMS

The **'Consultant'** – this refers to the team that is conducting the ESIA and the preparation of the EMP for the development

The **'Proponent'** – this refers to the institutions/departments that are directly involved in the implementation of the project, i.e. MAWF.

The **'Stakeholders'** – this refers to the people, organisations, NGOs that are directly or indirectly affected and interested by the project.

The **'Environment'** – this refers to the ecology, economy, society and politics.

ENVIRONMENTAL IMPACT ASSESSMENT

This **EnviroPlan Consulting cc** has been engaged by Parkland Energy Resources Pty LTD to conduct an Environmental Impact Assessment (EIA), develop an Environmental Management Plan (EMP) and to apply for an Environmental Clearance Certificate for a Mineral exploration license for the base and rare metals, nuclear fuel minerals and precious metals on an area covering 42 785.0372 hectares Erongo region. The farms which fall within EPL 8024 block is as follows:

- Bergrus North 94
- Ubib. 76
- Namibplaas East
- Bloemhof
- Tsawisis South 95
- Tsawisis North
- Nordenburg 76
- Navachb 58
- Naob 69

The proposed establishment triggered the application for an environmental clearance certificate.

Anticipated Environmental Impacts

- Low potential environmental impacts because mineral exploration drilling and pits do not require vast pieces of land.
- Some of the areas are already by previous drilling activities in the area.
- Adding on a management plan has been developed to mitigate any anticipated possible impacts of the project to the environment.
- Relative or moderate social impact (positive)

Social Impact

The project is anticipated to have a positive impact on the socio-economic environment of the Arandis area. It is expected to bring about significant improvements in business activities through integration, employment opportunities, and an enhanced transport system in the long run. The Interested and Affected Parties (I&APs) were informed about the project through site notices, door to door consultation, mail and email notice and newspaper advertisements. Comprehensive details regarding the consultation process can be found in Chapter 4 of this document, while additional information is provided in Appendix A..

Recommendation

Based on the findings of this Environmental Assessment, it is recommended that the proposed mineral exploration activities be approved and granted Environmental Clearance. The identified impacts can be effectively addressed through the implementation of the

recommended mitigation and management actions outlined in this report and the Environmental Management Plan (EMP). By following these recommendations, the significance of the impacts can be reduced to acceptable levels within reasonable timeframes. It is crucial that the general mitigation measures, as outlined in the report, are implemented as a minimum requirement. This will ensure that the proposed activities proceed in an environmentally responsible manner.

Therefore, it is advised that the necessary approvals and Environmental Clearance be granted, conditional upon the implementation of the recommended measures and adherence to the EMP. This will help ensure the sustainable management of the mineral exploration activities and minimize any potential adverse environmental effects.

ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations underpin the approach to this EIA study:

- The information received from the stakeholders, desktop surveys and baseline assessments are current and valid at the time of the study;
- A precautionary approach was adopted in instances where baseline information was insufficient or unavailable;
- Mandatory timeframes will apply to the review and adjudication of the reports by the competent authority and other government departments; and
- No land claims have been registered for the proposed site at the onset and registration of the study.

NB: *The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process. All data from unpublished research utilised for the purposed of this project is valid and accurate. The scope of this investigation is limited to assessing the potential biophysical, social and cultural impacts associated with the proposed project.*

1. CHAPTER ONE: BACKGROUND

1.1. Overview

Parkland Energy Resources Pty Ltd, the proponent, has recognized the economic potential of mineral deposits located in the Erongo Region. The company holds a license to explore a vast land area of 42,785.0372 hectares. The Exclusive Prospecting License (EPL 8024) granted to Parkland Energy Resources Pty Ltd covers privately owned farmland. Currently, the company has access to the mineral rights within EPL 8024. The proponent intends to conduct mineral exploration activities focused on base and rare metals, nuclear fuel minerals, as well as precious metals.

According to the Namibian environmental legislation, specifically the Environmental Management Act (No. 7 of 2007) and the Environmental Impact Assessment Regulations of 2012, conducting an Environmental Impact Assessment (EIA) is a requirement for obtaining an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism (MET) before the project can proceed. This is because mineral exploration is considered a listed activity that requires an ECC, as specified in the 2012 Environmental Impact Assessment Regulations of the Environmental Management Act. The relevant sections of the legislation pertaining to mineral exploration are as follows:

Table 1: Listed Activities -Environmental Management Act No. of 2007

ACTIVITY	RELEVANT SECTIONS
<p>MINING AND QUARRYING ACTIVITIES</p>	<ul style="list-style-type: none"> - 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 resources whether regulated by law or not. -3.3 Resource extraction, manipulation, conservation and related activities.

1.2. The Environmental Consultant

Parkland Energy Resources Pty Ltd has engaged the services of EnviroPlan Consulting cc as the designated Environmental Consultant responsible for conducting an Environmental Impact Assessment (EIA) and formulating an Environmental Management Plan (EMP) for the purpose of mineral exploration activities. The primary objective of this engagement is to prepare and submit an application for an Environmental Clearance Certificate to the Directorate of Environmental Affairs. EnviroPlan Consulting cc will oversee the assessment process, ensuring compliance with relevant environmental regulations and guidelines.

1.3. Project Location

The EPL 8024 block is situated in the western region of Namibia, specifically within the Erongo Region. It is a component of the Brandberg-Erongo mining district, as depicted in Figure 1. This area is known for its significant mineral potential and is targeted for mineral exploration activities. The farms which fall within EPL 8024 block is as follows:

- Bergrus North 94
- Ubib. 76
- Namibplaas East
- Bloemhof
- Tsawisis South 95
- Tsawisis North
- Nordenburg 76
- Navachb 58
- Naob 69

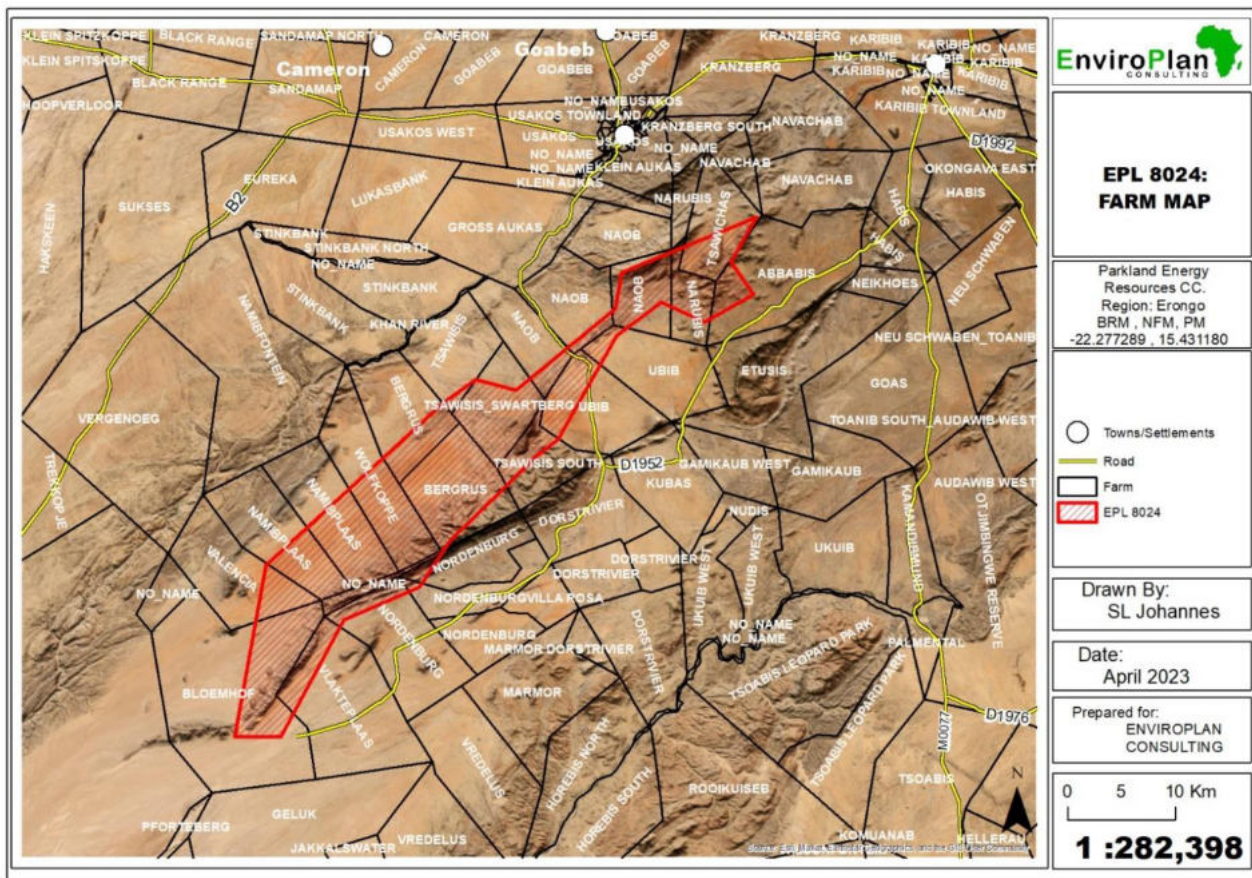


Figure 1: EPL 8024 Locality.

1.4. Need and Desirability of the Project

The need and desirability of the project stem from Namibia's reliance on the mining sector for economic growth. The mining industry has consistently contributed a significant percentage to the country's GDP, averaging 11.1% between 1990 and 2018. It remains the largest source of foreign exchange, accounting for approximately 45% of Namibia's foreign earnings. Mineral prospecting is aligned with national development plans, such as Vision 2030 and NDP V, and is emphasized in the Harambee Prosperity Plan II.

However, the development of the mining sector can be hindered by insufficient investment in mining exploration. The proposed project aims to promote economic and social advancement by creating employment opportunities. The mining sector currently employs 1.7% of the total workforce, according to the 2018 Labour Force Survey. By encouraging mining exploration, the project seeks to increase the sector's contribution to the Namibian economy.

The Erongo Region, despite hosting mining activities, still ranks as one of the least developed administrative regions in Namibia. The project presents an opportunity to expand mining activities in the region, which is expected to improve living conditions through economic spinoffs and investments. The project will generate direct and indirect employment opportunities through the supply chain and provision of support services. Short-term services such as maintenance and transportation can be outsourced to subcontractors, leading to the creation of both skilled and unskilled jobs.

Over the course of the 12-month exploration period, the project is anticipated to provide additional income to local and distant communities. The positive impact of job creation is particularly significant for the region, as it has a high prevalence of unemployment among unskilled or semi-skilled individuals. Therefore, the project's potential to generate employment and improve livelihoods at the household level is considered highly significant.

1.5. Scope of Work

This scoping study was carried out in accordance with the Environmental Management Act (EMA) (7 of 2007) and its 2012 EIA Regulations (GG No. 4878 GN No. 30).

After applying for ECC to the DEA, the first stage in the EA process is to submit a scoping report. This report provides the following:

Table 2: Sections Within Scoping Report

Description	Section of the Report
The need and desirability of the proposed project	Sub-Chapter 1.4
Project description	Chapter 2
Alternatives considered for the proposed project in terms of no- go option, design, and natural resources	Chapter 3

The relevant laws and guidelines pertaining to the proposed project	Chapter 4
Baseline environment in which the proposed activity will be undertaken	Chapter 5
The public consultation process followed (as described in Regulation 7 of the EMA Act) whereby interested and affected parties (I&APs) and relevant authorities are identified, informed of the proposed activity and provided with a reasonable opportunity to give their concerns and opinions on the project	Chapter 6
The identification of potential impacts, impacts description, assessment, mitigation measures and recommendations	Chapter 7
Recommendations and conclusions to the report	Chapter 8

2. CHAPTER TWO: PROJECT DESCRIPTION

Explorations comprise various phases. For this EIA, the phase-based activities were categorized to enable impact assessment and analysis. The different project sections are as follows:

2.1.1. *Construction Phase (Site Preparation)*

During the construction phase, several activities will be undertaken to prepare the site for mineral exploration. The following actions will be implemented:

- **Access Agreements:** Agreements will be established between the exploration team and landowners to ensure a mutually beneficial working relationship. These agreements will outline the terms and conditions regarding access to the land.
- **Site Visits and Field Camps:** The exploration team will conduct initial site visits to identify suitable locations for the establishment of field camps. These camps will serve as secure areas to store exploration equipment and vehicles. No employees will be accommodated within the Exclusive Prospecting Licences (EPLs) themselves.
- **Land Clearing:** Small parcels of land will be cleared specifically for the construction of base or field camps and staging areas. The proponent will ensure that only areas with minimal disturbance to the natural environment and wildlife are selected for clearing.
- **Access Routes and Haul Tracks:** In addition to the existing farm roads network leading to the target areas, additional tracks or extensions may be created to facilitate access to the designated sites. Graveling and compaction of vehicle track surfaces may be carried out to minimize maintenance requirements and ensure smooth traffic flow. It is important to note that there are no bitumen-standard roads within the EPL area, and no permanent structures will be constructed for exploration purposes.
- **Fencing:** Where feasible, fences will be erected around field camps and target areas to prevent livestock from entering these sites. This measure aims to minimize potential interference with the exploration activities.

The implementation of these site preparation activities will be guided by the need to understand surface drainage, groundwater conditions, and the identification and joint agreement with landowners on ecologically sensitive areas. The focus will be on minimizing environmental disturbance and maintaining harmonious relationships with landowners and the natural surroundings.

2.1.2. *Operational Phase*

During the operational phase, advanced exploration activities will be conducted to validate previous exploration results and obtain detailed information about the mineral deposits. The following activities and considerations will be undertaken:

- **Sampling:** Sampling will be carried out to validate and confirm the previous exploration findings regarding the mineral deposits. The appropriateness of bulk sampling will depend on the morphology of the deposit. Various mineral exploration drilling methods will be employed, including auger, air-core, and diamond core drilling.
- **Air-core drilling:** This specialized reverse circulation drilling method uses a small annular bit to cut a solid core of rock from relatively soft or easily broken material. The recovered core sections and rock chips are brought up through the center of the drill stem, similar to standard reverse circulation drilling. Air-core drilling is suitable for penetrating and coring soft, sticky clays that may bind a normal blade bit.
- **Diamond core drilling:** This method utilizes an annular, diamond-impregnated bit mounted on rotating rods. The diamonds in the bit contribute to its hardness, allowing it to drill through the hardest rocks. The drilling fluid or water/mud mixture is used to lubricate the bit and carry the cuttings to the surface through the drill rods. The return water containing suspended ground rock material is collected and settled in a sump.
- **Site Rehabilitation:** Dug-out trenches will be backfilled with waste rock (gangue), and stockpiled topsoil will be returned to the backfilled areas. The sites will undergo re-vegetation to restore them to their pre-exploration state. Boreholes will be sealed, and rehabilitation activities will be conducted concurrently with exploration, including ore removal.
- **Water Requirements:** Water for exploration activities will be sourced from existing boreholes. Approximately 80,000 liters (80 m³) per day will be required, mainly for dust suppression around tipping areas and vehicle tracks. An additional 200 liters of domestic water will be needed daily.
- **Waste Management:** The waste generated during exploration will primarily consist of non-mineral rock material derived from trenching activities. The amount of domestic waste generated by the exploration team is minimal. Domestic waste will be transported out of the EPL area on a daily basis and disposed of at an approved landfill site. There are no licensed waste disposal sites within the project area.
- **Sewage Management:** Adequate portable chemical toilets will be provided for workers, and these will be emptied according to the manufacturer's operational standards and occupational sanitary provisions. Licensed waste contractors will be responsible for sewage removal services.

These measures aim to ensure responsible resource management, minimize environmental impact, and comply with relevant regulations and standards during the operational phase of mineral exploration. Equipment, materials, and services for exploration will be sourced from contractors in proximity to the project site. Temporary employment opportunities will be created during the exploration activities, and personnel will be accommodated at an identified exploration camp area, subject to an environmental risk assessment and submission of the biannual report on exploration activities.

2.1.3. Decommissioning/Closure Phase

During the decommissioning/closure phase, the following activities will take place:

- **Removal of Equipment:** All exploration equipment will be removed from the site.
- **Dismantling of Facilities:** Any temporary facilities or structures that were established during the operational phase will be dismantled.
- **Backfilling of Trenches:** All trenches that were dug during exploration activities will be backfilled.
- **Rehabilitation and Re-vegetation:** The surface areas that were affected by exploration will undergo rehabilitation and re-vegetation in accordance with applicable standards. This process aims to restore the site to its pre-exploration state and promote ecological restoration.
- **Safe Closure:** The closure phase will ensure that all necessary measures are taken to safely close the site and minimize any potential environmental impacts.

The decommissioning/closure phase is an essential part of responsible mineral exploration, ensuring that the site is properly managed and restored once exploration activities have concluded.

2.1.4. Environmentally sensitive areas identified

The scoping study has identified that the proposed exploration activities will not take place in environmentally sensitive areas such as community forests, conservancies, or areas with memorial sites. To ensure proper assessment and management of any potential heritage and archaeological impacts, a Specialist Heritage and Archaeological Impact Assessment was commissioned specifically for the project area. This assessment will provide detailed information on the presence of any sensitive heritage or archaeological sites within the exploration area and will guide the implementation of appropriate measures to mitigate any potential impacts. By conducting these assessments, the project aims to minimize any adverse effects on environmentally sensitive areas and cultural heritage sites.

3. CHAPTER THREE: PROJECT ALTERNATIVES CONSIDERED

Alternatives are defined as: “different means of meeting the general purpose and requirements of the activity” (Environmental Management Act (2007) of Namibia and its regulations (2012)). This chapter will highlight the different ways in which the project can be undertaken and identify the alternative that will be the most practical but least damaging to the environment.

3.1. No-Go Alternative

The “No-Go” alternative is the option of not proceeding with the activity, which typically implies a continuation of the status quo. This would mean that the mineral exploration activities will not be done, and potential mining opportunities will be lost. The local economy will not be improved.

In considering the proposed project, the ‘no-go’ option cannot be the preferred alternative.

3.2. Resources alternatives

In terms of the resources that may be required for the proposed upgrade works, their alternatives are presented in Table 5 below.

Table 3: Alternatives considered in terms of services infrastructure

Services	Proposed source	Alternative source
Water	Water to be sourced from boreholes.	Piping water from other sources out of the project area. This would be done to augment local water supplies
Power	Electric drives and generators	Solar
Power for cooking	Gas stoves	Solar
Worker’s accommodation	Campsite at the project site	Accommodation in the nearest town (depending on commuting and accessibility)
Exploration Technology	Bulk Sampling	Diamond Drilling Air core drilling
Waste Management		
Sewage	Portable toilets – these are easily transportable and have no direct impact on the	Ventilated improved pit (VIP) latrine.

	environment or ecology (if waste is properly disposed of)	
Domestic waste	Onsite waste bins, regularly emptied at the nearest landfill	Driving waste daily to the nearest town landfill
Hazardous waste (chemicals)	Waste generated is to be transported to and disposed of at an appropriate facility in the nearest town equipped for the disposal of hazardous waste	None

3.3. Conclusions on the Considered Alternatives

The alternatives considered for the project are summarized as follow:

- No-go vs. continuation of the proposed project: The no-go alternative is not considered to be the preferred option. Should the proposed project be discontinued, none of the potential impacts (positive and negative) identified would occur. Therefore, the road condition will remain unchanged and would not be improved.
- Project design: The proposed exploration methodology will be informed by this ESIA study to ensure minimal impacts on the receiving environment.
- Resources:
 - **Water**-Water for the proposed activity is to be sourced from boreholes.
 - **Energy**- Increased use of solar technologies is promoted within the development. Where it cannot be successfully employed the use of generators would be required.
 - **Waste** - Domestic and hazardous waste is to be disposed of appropriately. Portable toilets are to be made available at the construction site and the exploration camp and these are easily transportable and have no direct impact on the environment or area ecology (if waste is properly disposed of).

4. CHAPTER FOUR: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

4.1. Introduction

In order to ensure compliance with legal requirements and promote environmental preservation, a comprehensive review of relevant Namibian and international legislation, policies, and guidelines has been conducted. This review aims to inform the project proponent, interested and affected parties, as well as decision-makers at the Directorate of Environmental Affairs (DEA), about the specific requirements and expectations outlined in these instruments.

By conducting this review, the project seeks to align its activities with established frameworks and regulations, demonstrating a commitment to responsible and sustainable practices. It also ensures that all stakeholders are aware of the legal obligations and standards that must be met throughout the project lifecycle. This chapter provides an overview of the policy, legal, and administrative framework that governs the proposed development, establishing a foundation for compliance and environmental stewardship..

The project triggers the following Namibian legal instruments.

- The Constitution of the Republic of Namibia (1990).
- Environmental Assessment Policy of Namibia 1994.
- Environmental Management Act No. 07 of 2007.
- EIA Regulations GN 57/2007 (GG 3812).
- The Water Act 54 of 1956.
- The Water Resources Management Act No. 11 of 2013.
- Pollution Control and Waste Management Bill.
- Atmospheric Pollution Prevention Ordinance 11 of 1976.
- National Solid Waste Management Strategy.
- Soil Conservation Act 76 of 1969.
- Road Traffic and Transport Act, No. 22 of 1999.
- Forest Act 12 of 2001.
- Mineral Policy of Namibia
- National Policy on Climate Change for Namibia (2011).
- National Climate Change Strategy & Action Plan 2013 – 2020.
- Nature Conservation Ordinance (1996).
- National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022.
- Labour Act 11 of 2007.
- Health and Safety Regulations GN 156/1997 (GG 1617).
- Public Health Act 36 of 1919.
- Public and Environmental Health Act 1 of 2015; and
- National Heritage Act 27 of 2004.

These above-listed legislations and policies and their inclusion in the proposed project assessment are further presented in Table 6 below.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
The Constitution of the Republic of Namibia (1990)	The articles 91(c) and 95 (i) commits the state to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the Sustainable objectives which include: Guarding against overutilization of biological natural resources, Limiting over-exploitation of non-renewable resources, Ensuring ecosystem functionality, Maintain biological diversity.	Exploration activities can interfere with ecological processes. Attention should be given to the state of water resources and biodiversity
Environmental Assessment Policy of Namibia 1994	The Environmental Assessment Policy of Namibia states Schedule 1: Screening list of policies/ plans/ programmes/ projects subject to environment must be accompanied by environmental assessments. "The development activities" are on that list. The policy provides a definition to the term "Environment" broadly interpreted to include biophysical, social, economic, cultural, historical, and political components and provides reference to the inclusion of alternatives in all projects, policies, programmes, and plans.	The activity triggers an environmental impact assessment prior to commencement The proposed development requires the assessment of all possible environmental and social impacts to avoid, minimise or compensate environmental damage associated with the activities.
Environmental Management Act No. 07 of 2007	Requires that activities with significant environmental impact are subject to an environmental assessment process (Section 27). Requires for adequate public participation during the environmental assessment process	The nature of the proposed exploration and interrelated activities has potential to cause adverse environmental impacts to the surrounding environment. Activities such as trenching can cause significant environmental impacts. Therefore, proper assessments should guide project planning

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
	<p>stakeholders to give their opinions about a project (Section 2(b-c)).</p> <p>According to Section 5(4) a person may not discard waste as defined in Section 5(1)(b) in any way other than at a disposal site declared by the</p> <p>Section 3 (2) (b) states that “community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted and facilitated” is key.</p> <p>Section 3 (2) (e) states that “assessments must be undertaken for activities which may have a significant effect on the environment or the use of natural resources”.</p>	<p>The EIA study considered full stakeholder participation. Stakeholder consultation was fully conducted.</p> <p>The proposed development is involving the utilisation of natural resources (water and land). Therefore, benefits from the implementation of the project must be shared equally.</p> <p>Environmental cost relating to project shall not be borne by communities found in the project area and surroundings.</p> <p>Project shall not commence without an environmental clearance certificate</p>
<p>EIA Regulations GN 57/2007 (GG 3812)</p>	<p>Details requirements for public consultation within a given environmental assessment process (GN No 30 S21).</p> <p>Details the requirements for what should be included in an Environmental Scoping Report (GN No 30 S8) and an EIA report (GN No 30 S15).</p>	<p>The implementation of the project triggers the need for consultation of all affected and interested stakeholders regarding the development at all project development phases from planning to operation of the facility. A public consultation meeting was held in respect to this, and all the concerns and issues were noted and addressed in this report.</p>
<p>The Water Act 54 of 1956</p>	<p>The Act was formulated to consolidate and amend the laws relating to the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes; to make provision for the control, in certain respects, of the use of sea water for certain purposes; for the control of certain activities on or in water in certain areas.</p>	<p>The activities directly affecting water conservation, management and use therefore, requires the implementation of water conservation measures.</p>

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Minerals (Prospecting and Mining) Act, 1992 (Act no. 33 of 1992)	Act provides the licensing procedures, the rights of holders, the administration, and the ownership of minerals. In addition, the Act requires mining companies to provide detailed studies on the potential impact of the operations to the surrounding environment, how to mitigate them and rehabilitations plans	Prospecting or mining operations shall not commence except in accordance with license granted. Renewals of EPLs are accommodated twice for two-year periods, with the area decreasing by 25 per cent with each renewal
Pollution Control and Waste Management Bill	The bill aims to “prevent and regulate the discharge of pollutants to the air, water and land” Of particular reference to the Project is: Section 21 “(1) Subject to sub-section (4) and section 22, no person shall cause or permit the discharge of pollutants or waste into any water or watercourse.” Section 55 “(1) No person may produce, collect, transport, sort, recover, treat, store, dispose of or otherwise manage waste in a manner that results in or creates a significant risk of harm to human health or the environment.”	The proposed activity triggers Section 21 and 22 of the bill. Activities such as trenching transportation, primary crushing may require the robust adoption of in-situ pollution mitigation measures. Contractors of the civil works of the project should make it mandatory that they manage their waste in a manner that do not cause environmental harm and risk both to the surroundings and the local communities.
Atmospheric Pollution Prevention Ordinance 11 of 1976	The law provides for the prevention of atmospheric pollution, and for matters incidental thereto. The law regulates and prohibit pollution from industries particularly smoke and dust. The ordinance considers air pollution from point sources but does not address air quality standards,	Mineral exploration processes will most likely affect ambient air quality. Efforts to suppress and monitor dust should be adopted as recommended in the EMP.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
National Solid Waste Management Strategy	<p>The Strategy ensures that the future directions, regulations, funding, and action plans to improve solid waste management are properly co-ordinated and consistent with national policy, and to facilitate co-operation between stakeholders</p> <p>Waste disposal presents a challenge to solid waste management in Namibia. The top priority is to reduce risks to the environment and public health from current waste disposal sites and illegal dumping in many areas of Namibia.</p>	<p>Exploration activities can potentially generate significant amount of waste material that need careful management. The obligation to meet waste management objectives should be borne by both proponent and contractors.</p> <p>The proponent should limit the exposure of waste to the natural environment and surrounding.</p> <p>In-situ waste management plans should be adopted and implemented prior the commencement of operations.</p> <p>Rock waste and other non-mineral waste should be stored and disposed in an environmental friendly manner. Waste should be carted away to licenced waste disposal sites.</p>
Soil Conservation Act 76 of 1969	<p>The Act established to consolidate and amend the 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 the Republic of Namibia.</p>	<p>The construction of auxiliary infrastructure such as access roads or tracks to exploration targets should include systems and mechanism for preventing erosion.</p>
Road Traffic and Transport Act, No. 22 of 1999	<p>The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto.</p>	<p>Mitigation measures should be provided for if the roads and traffic impacts cannot be avoided. Should the proponent wish to undertake activities involving road transportation or creation new access adjoining national roads, relevant permits will be required from the Ministry of Works and Transport</p>

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Forest Act 12 of 2001	<p>Section 10 (1) set out the aim of the forest management as to:</p> <p>The purpose for which forest resources are managed and developed, including the planting of trees where necessary in Namibia is to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment.</p>	<p>The proposed project will likely result in the disturbance of indigenous vegetation of conservation significance including the disruption of biological processes.</p>
	<p>(b) any living tree, bush or shrub growing within 100 metres of a river, stream, or watercourse.</p>	<p>The project will not result in the removal of living trees, bushes and shrubs growing within 100m of a river, stream, or watercourse.</p>
	<p>(2) A person who wishes to obtain a licence to cut and remove the vegetation referred to in subsection (1) shall, in the prescribed form and manner, apply for the licence to a licensing officer who has been designated or appointed for the area where the protected area is situated.</p>	<p>The removal of trees in the above instances would require the contractors or sub-contractors to acquire necessary permits first.</p>
National Policy on Climate Change for Namibia (2011)	<p>The National Policy on Climate Change pursues constitutional obligations of the Government of the Republic of Namibia, namely for "the state to promote the welfare of its people and protection of Namibia's environment for both present and future generation."</p>	<p>Measure should be adopted by NHIG to prevent or minimise toxic emissions into the atmosphere. Dust suppression and monitoring will be employed, to ensure that air quality objective tied to climate change mitigation are met.</p>
National Climate Change Strategy &	<p>The Strategy outlines Namibia's response to climate change. The strategy aims to address and plan for action against climate change, both through</p>	<p>The development should adopt measures that strengthen sustainable utilization of water resource The implementation should be very careful on not to cause harm to the available water</p>

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Action Plan 2013 - 2020	mitigation and adaptation actions. In its adaptation strategy, the Strategy recognises the role of a sustainable water resource base.	resources but improve the management through various conservation technics.
	<p>The Strategy proposed strategies that aim to:</p> <p>Strategic Aim 1: Further improve the overall climate change understanding and related policy responses in water resources sector.</p> <p>Strategic Aim 2: Monitoring and data collecting technologies of surface and underground water are developed and implemented at basin/watershed level.</p>	<p>The proponent should invest capital on strengthening climate change and adaptation through cleaner production systems implementation.</p> <p>Certification by international standards such as ISO14001 can help with climate sustainability, and is recommended.</p>
Nature Conservation Ordinance (1996)	This ordinance relates to the conservation of nature; the establishment of game, parks, and nature reserves; the control of problem animals; and highlights matters incidental thereto.	<p>The activities of the project are highly localized. The likelihood of project activities interference with any protected parks and nature reserves objectives is non-existent. However, there is need for proper designing and planning of the drainage and water network of the project to make sure that any service infrastructure is not in conflict with the provisions listed in the Nature Conservation Ordinance.</p> <p>All species of birds are protected except the huntable game birds mentioned in Schedule 6</p>
National Biodiversity Strategy and Action Plan (NBSAP2) 2013 – 2022	The action plan was operationalized in a bid to make aware the critical importance of biodiversity conservation in Namibia, putting together management of matters to do with ecosystems protection, biosafety, and biosystematics protection on both terrestrial and aquatic systems.	The proposed project during construction and operation phases, potentially triggers ecosystem threats from pollution. As such mechanisms for environmental compliance and monitoring will be put in place, ultimately aimed at protecting biodiversity.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
Labour Act 11 of 2007.	Empowers the minister responsible for labour to publish regulations pertaining to health and safety of labourers (S135). Details requirements regarding minimum wage and working conditions (S39-47).	Explorations invite significant amount of laborious work. Therefore, there is need to ensure that proponent without charge to employees provide a working environment that is safe, and adequate facilities provided for the upkeep of employee welfare standards. The Ministry of Labour and Safety demands that a health management policy will be drafted and instituted.
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety requirements.	<ul style="list-style-type: none"> -Occupational health and safety provisions during construction and operational phases should be clearly outlined. -Compliance monitoring and responsibilities for compliance monitoring should be clearly stated
Public Health Act 36 of 1919	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	<p>Compliance to the Public health act will be ensured in relation to the following:</p> <ul style="list-style-type: none"> - Sanitation facilities -Communicable diseases -Emergency healthcare provision
Public and Environmental Health Act 1 of 2015.	To provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.	<ul style="list-style-type: none"> - Covid workplace measures
National Heritage Act 27 of 2004	<p>Section 48(1) states that “A person may apply to the (Heritage) Council for a permit to carry out works or activities in relation to a protected place or protected object”</p> <p>Protects and conserves cultural heritage and cultural resources with special emphasis on places and sources of National heritage including graves, artefacts, and any objects older than 50 years.</p>	The project impacts are localized and there are no heritage or cultural artefacts relating to project area. However, if heritage resources (e.g., human remains etc.) discovered during implementation, guidelines dictate that a permit be acquired from the National Heritage Council of Namibia for relocation of any artefacts or specimen.

LEGISLATION/POLICY	PROVISION/SUMMARY	PROJECT APPLICABILITY
SANS 1929: 2005	<p>Dust particulates from excavations /ore crushing that are smaller than 1mm are deemed dangerous to both plants and humans. As such a dust monitoring following the ASTM D1739 method should be used for monitoring dust emissions from any crushing plant anticipated.</p> <p>Dust chemical analysis and fallout quantities are specified for industrial and residential environs.</p>	A dust fallout monitoring plan can be instituted around project area

Table 4:Policies, legal and administrative regulations

5. CHAPTER FIVE: ENVIRONMENTAL AND SOCIAL BASELINE

5.1. Introduction

The proposed project will take place within a distinct biophysical and social environment. To understand the existing conditions of the environmental features in the project area, this chapter provides a description of the baseline conditions. The baseline conditions are specifically assessed for the subject area, which includes the regions and areas that will be directly affected by the project road. The Exclusive Prospecting License (EPL) is situated within the Arandis of the Erongo Region.

By establishing the baseline conditions, the project can effectively assess the potential impacts and changes that may occur because of its activities. This chapter serves as a starting point for understanding the existing environmental and social context, allowing for informed decision-making and appropriate mitigation measures throughout the project implementation.

5.2. Socio-economic profile

The socio-economic profile of the Arandis area and Arandis provides valuable insights into the population, employment, and economic activities in the region.

According to the latest census results from the Namibia Statistics Agency (NSA) in 2012, the total population of Arandis is approximately 5,132, while the population of Arandis is around 11,450. The population of Arandis has experienced a significant increase of approximately 38% since 2001 when it was 3,726. The estimated size of the informal settlement in the Usab suburban area is 450 (KTC, 2010). The annual growth rate for the Erongo Region, where Arandis is located, is estimated at 3.4% based on population growth between 2001 and 2011. However, it is expected to be slightly lower for Arandis. The percentage increase in urban population between 2001 and 2011 is slightly lower than the national average of approximately 43%. Nevertheless, the annual growth rate for the Erongo Region is significantly higher than the national average of 1.4%. It is important to note that the population of nearby farms where the proposed exploration activities are planned is smaller compared to the townlands.

The economic activities in and around Arandis encompass a combination of mining, both large and small scale, and farming. The most significant mining activity in the area is Rossing Uranium. The unemployment rate in Arandis is reported to be 30% for residents of working age (15 years and older), which is lower than the national average of 37% (NSA, 2012). However, unemployment remains a concern, and the proposed mineral exploration project may potentially lead to the establishment of a mine, which could have a positive impact on employment opportunities.

The socio-economic profile provides a snapshot of the current conditions and economic landscape in the project area, highlighting the potential benefits and challenges that the proposed mineral exploration project may bring to the local communities and economy.

5.2.1. Land Use

In Arandis, the predominant land uses are mining and tourism. However, it is important to note that the main land use affected by EPL 8024, the proposed exploration project, is private farm land. The specific activities associated with the exploration project will occur on the designated private farmland within the project area.

Mining plays a significant role in the economic activities of the region, with notable mining operations such as Rossing Uranium. The presence of mining activities indicates the utilization of land for mineral extraction and processing. Tourism is another important land use in the area, highlighting the potential for nature-based tourism and attractions that draw visitors to the region.

It is essential to consider the existing land uses and their potential interactions with the proposed exploration activities. Understanding the land use context is crucial for assessing the potential impacts and ensuring that the exploration project aligns with the existing land use patterns and regulations in Arandis.

5.3. Climate & Topography

5.3.1. Climatic Conditions

The climatic conditions of the project area presented herein have been sourced from a recent EIA Study done in Arandis, which forms part of the proposed road route (centre point of the project). Therefore, these conditions would apply to the entire area. The climatic condition is presented in **Table 5** below:

Table 5: Climatic conditions around the entire project site area

Climatic feature	Description
Climate classification	Semi-arid area
Average rainfall	Average to be between 200 and 250mm annually
Variation in rainfall	Averaged to be ranging between 40 and 50% annually
Average evaporation	Average between 2,800 and 3,000mm annually
Precipitation	The highest summer rains are experienced in February. Irregular and unpredictable, high intensity, highly localised storm events between October and April does occur
Water deficit	Water deficit in the area is averaged to be between 1,501 and 1,700mm annually
Temperatures	Temperatures in the area are averaged to be more than 22°C annually
Wind direction	The wind direction in the project area is predominantly westerly

5.3.2. Topography

Topographically, in Erongo Region the land rises steadily from sea level to about 1,000 meters across the breadth of Namib. The Namib land surface is mostly flat to undulating gravel plains, punctuated with occasional ridges and isolated inselbergs, hills and mountains. Namibia’s highest mountain Brandberg (2,579m) lies in the far northern part of Erongo Region (SAEIA, 2010). However, the project site have undulating or gently rolling terrain rather than extreme elevations or steep mountains. It suggests a more moderate topography that may consist of hills, plateaus, or gradual slopes as illustrated in figure 2.

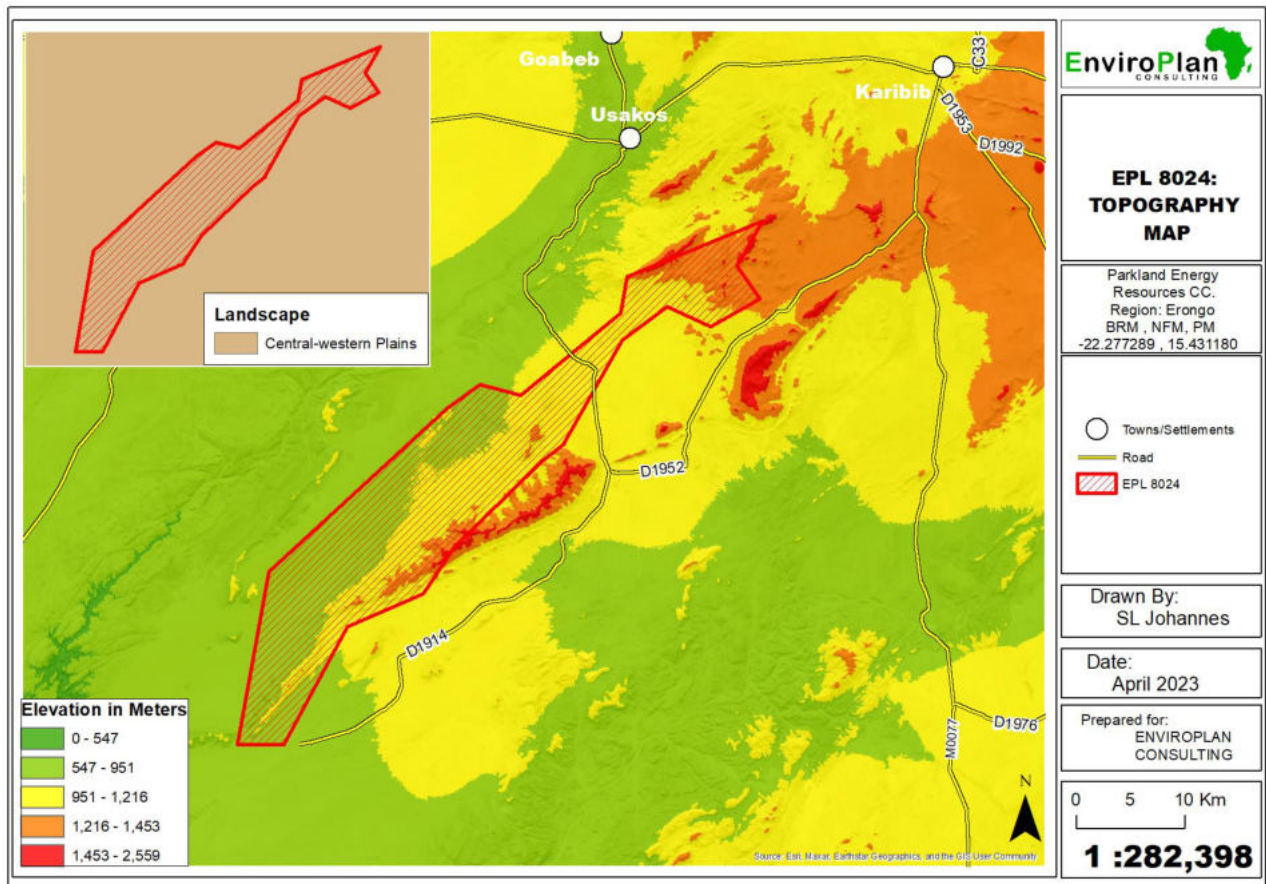


Figure 2: Topography Map for the project area

5.4. The General Geology, Surface and Ground Water

5.4.1. Soils

In the project area, three types of top soils have been identified: rock outcrop, eutric regosols (dominant), and petric calcisols (least dominant).

- **Rock Outcrop:** Rock outcrop refers to areas where the bedrock or underlying rock formations are exposed at the surface. These areas are characterized by minimal or no soil development due to the absence of a thick layer of loose materials such as sediments or organic matter. Rock outcrops typically consist of solid rock, and vegetation cover may be sparse or absent.
- **Eutric Regosols:** Eutric regosols are the dominant top soil type in the project area. Regosols

are soils that have limited soil development, often characterized by a shallow depth and a lack of distinct horizons (layers) typically found in more mature soils. Eutric regosols are regosols that have a relatively high nutrient content. They may contain a mixture of mineral particles, organic matter, and variable amounts of clay, silt, and sand. Eutric regosols are often found in areas with moderate to good drainage.

- Petric Calcisols: Petric calcisols are the least dominant top soil type in the project area. Calcisols are soils that have a high content of calcium carbonate (lime) derived from the parent material or through processes such as the accumulation of wind-blown dust. Petric calcisols specifically refer to calcisols with a relatively high percentage of rock fragments or stones. These soils may have limited fertility due to the presence of calcareous materials.

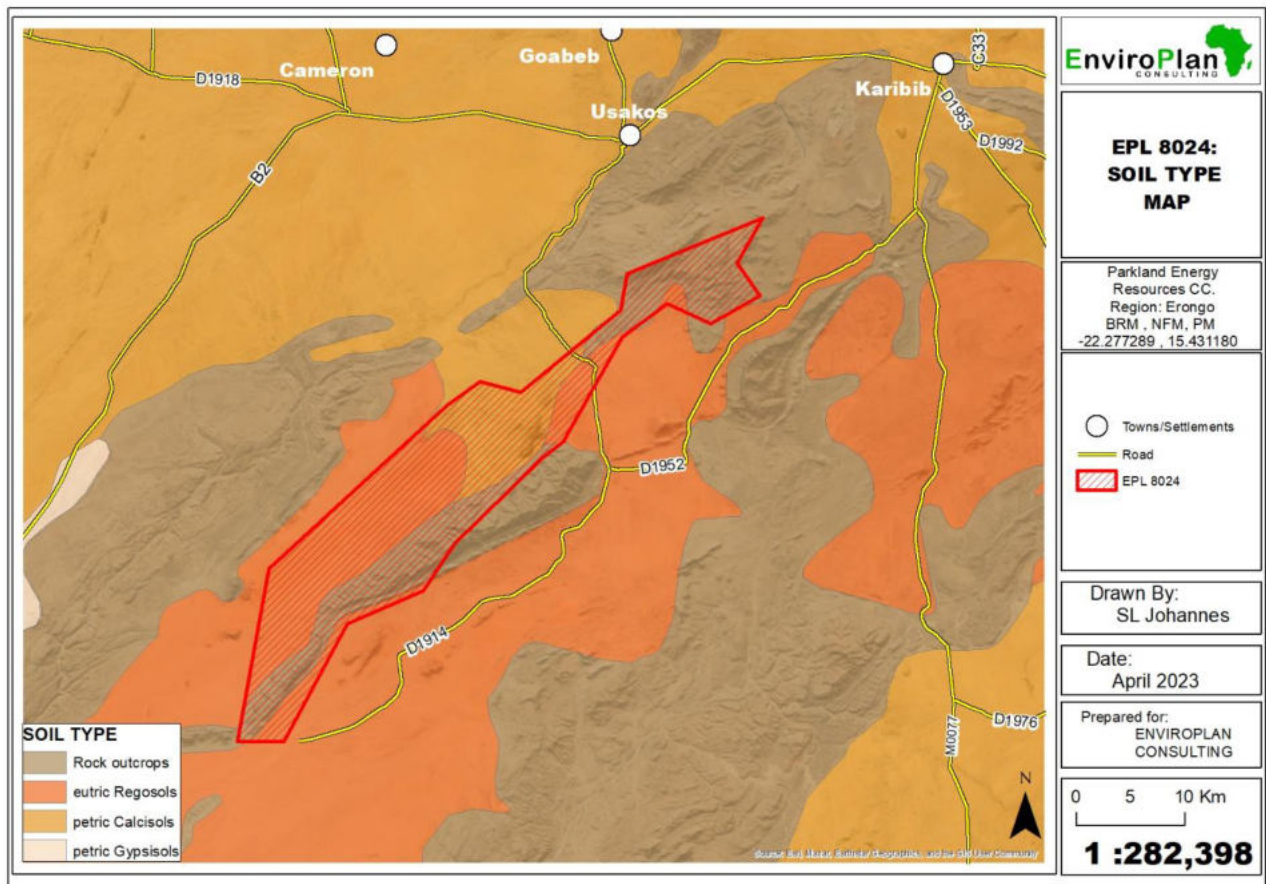


Figure 3: Soil type Map for the project area



Figure 4: soil type in project area

5.4.2. Geology

The local geological units area described below:

- Quaternary deposits (Namib sand dunes, Langer Heinrich fluvial deposits, Leeukop calcareous conglomerate, sand dunes of the Namib Desert Plains that cover extensive areas south of the Swakop River, along the coast and east of the Khan River.
- The Red granites are a heterogeneous group of plutons comprising autochthonous and intrusive granite bodies of Namibian to Cambrian age, and occur throughout the area. Early syn-tectonic Namibian red granites outcrop in the cores of some of the north-east trending domes along the Khan River for example. They are reddish to light-brown, medium-grained and often gneissic or migmatitic granites and are enveloped by rocks of the Abbabis Metamorphic Complex and the Nosib Group, from which they were possibly derived through partial melting. They are mainly composed of quartz, K-feldspar, plagioclase and biotite, while accessory mafic minerals often give the rock a speckled appearance. Thus, the

transition between the autochthonous red granites and the country rocks is generally ill-defined.

- The Arandis Formation consists of schists, calc-silicate rocks and marbles belonging to the Karub, Spes Bona, Okawayo and Oberwasser Members (Table 4). The latter three correlate with the Spes Bona, Okawayo and Oberwasser Formations in the Karibib and Omaruru districts, and on the lower Omaruru River (Botha, 1978; Badenhorst, 1992), from where they were first described. In the poorly exposed regions east of Henties Bay and in the Khan-Swakop area they are comparatively thin and have only recently been recognized (Lehtonen et al., 1993).
- The marble-dominated Karibib Formation is widely distributed in the Central (Swakop) Zone and underlies large parts of the flat, poorly exposed coastal region. The light-coloured carbonates which are readily recognizable on aerial and satellite photographs attain a maximum thickness of some 700 m in the Karibib area (Badenhorst, 1992). A carbonate platform depositional environment is suggested for the Karibib Formation.
- Overall, the geology specifically found in EPL 8024 is shown in figure 4 below.

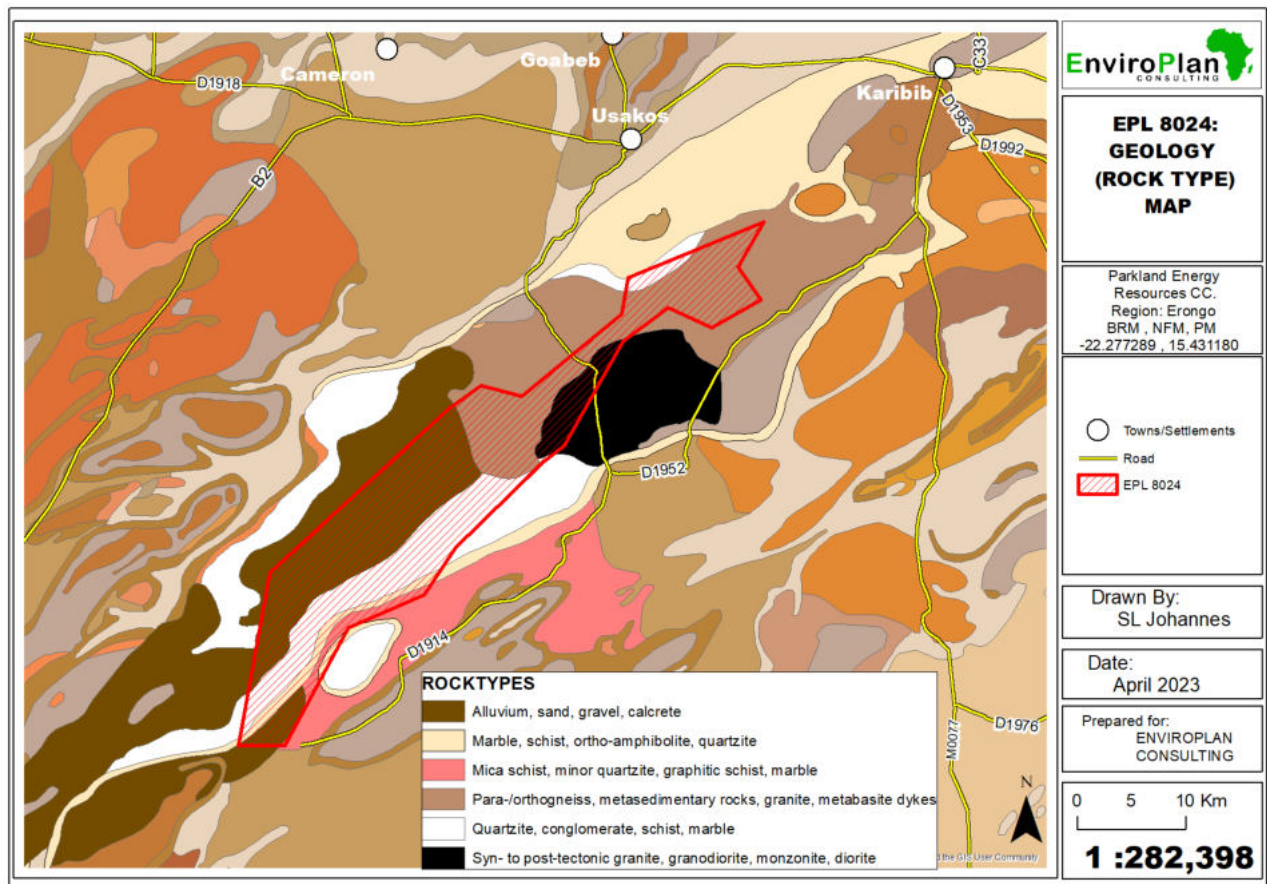


Figure 5: Geology Map for the project area

5.4.3. Hydrology (Surface Water & Ground water)

The Khan, Wildhond and Epony ephemeral streams are in proximity to the project area on the northeast side, close to Karibib. Sandy riverbeds were identified the EPL area, however these are ephemeral which means that they are normally dry on surface but occasionally flow immediately

after heavy rainfall events. Rock body with little ground water potential and porous aquifers are found withing the EPL as illustrated in figure 4. During exploration, flood protection measures for should be implemented.



Table 6: Sandy riverbeds within the project area

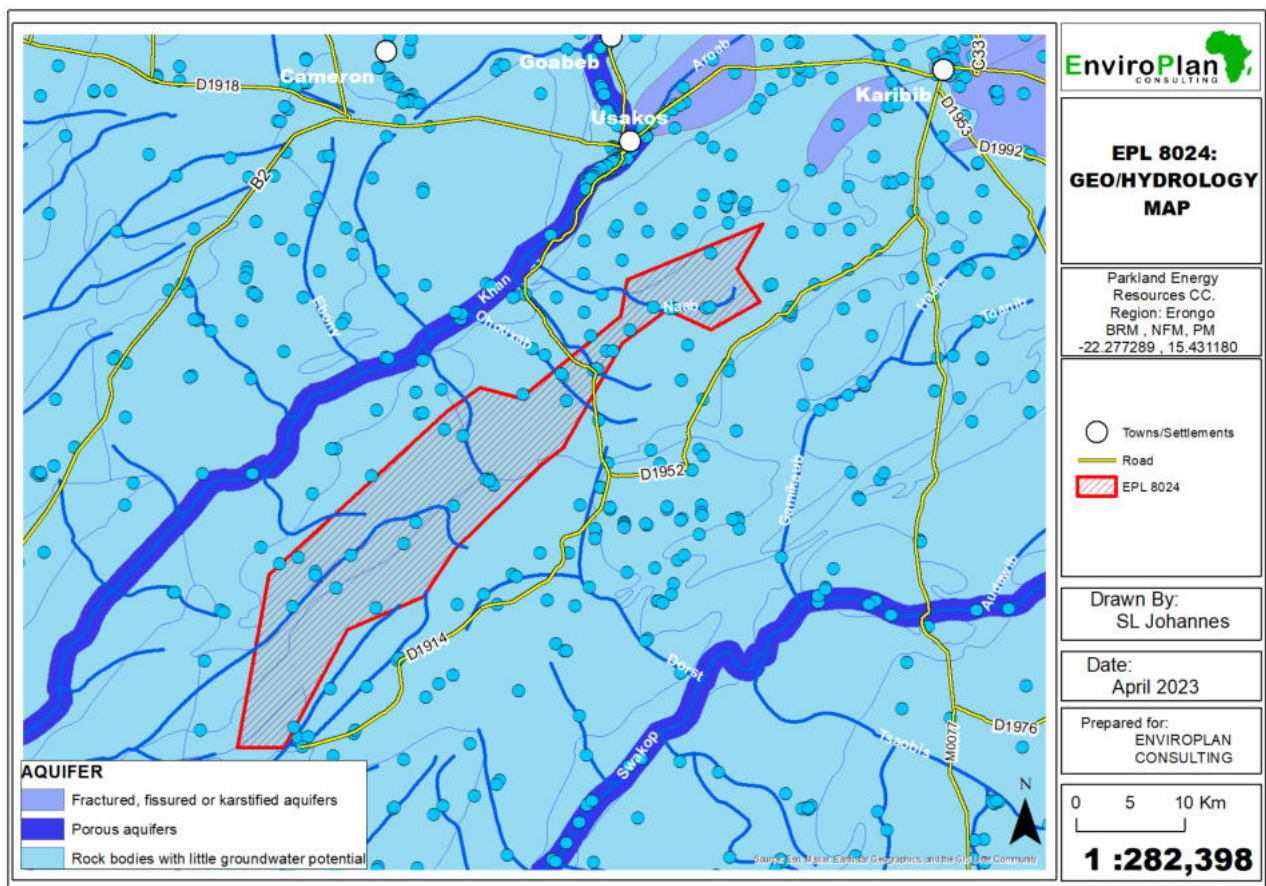


Figure 6: Topo and Hydrological Map for the project area

5.4.3.1 5. Ground water vulnerability

Groundwater vulnerability refers to the likelihood or susceptibility of groundwater resources to become contaminated or polluted. In the case of Arandis, the groundwater vulnerability is

considered to be low-moderate as illustrated in figure 5 below. This means that the groundwater in the area is less likely to be affected by pollutants or contaminants.

The low vulnerability of groundwater in Arandis can be attributed to several factors. Firstly, the topography of the area, which consists of flat to undulating gravel plains, provides a natural barrier and restricts the movement of potential contaminants. The absence of significant slopes or major drainage features reduces the risk of surface runoff infiltrating into the groundwater system.

Furthermore, the geological characteristics of the region contribute to the low vulnerability of groundwater. The presence of cohesive and impermeable layers in the subsurface acts as a protective barrier, limiting the downward movement of pollutants towards the groundwater aquifers. The geological formations in the area are generally composed of rocks with low permeability, such as gravel and clay, which further reduce the potential for contamination.

Additionally, the hydrological conditions, such as the low recharge rates and limited groundwater extraction activities in the Arandis area, further decrease the vulnerability of the groundwater to pollution. The limited human activities that involve the use of hazardous substances, such as industrial activities or intensive agriculture, also contribute to the low risk of groundwater pollution.

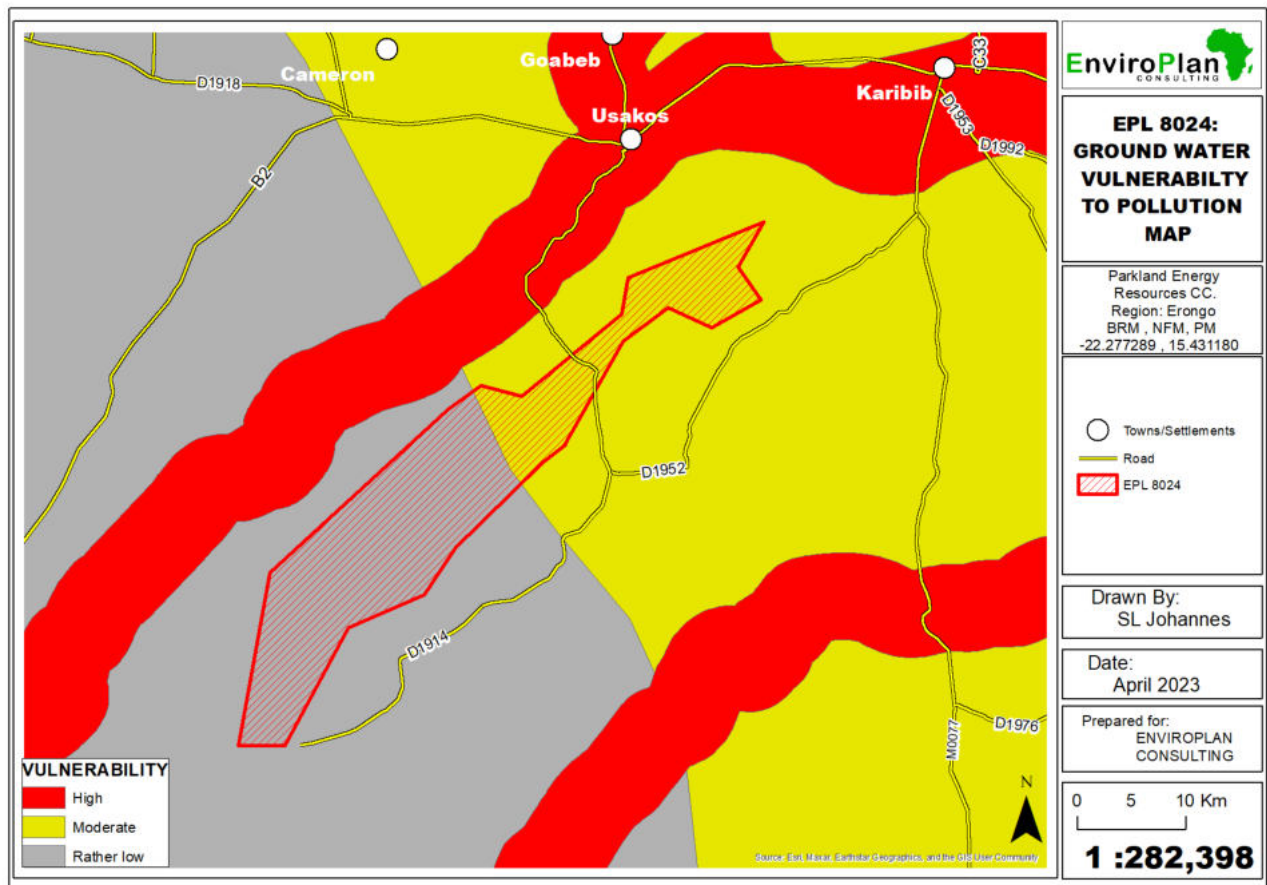


Figure 7: Ground water Vulnerability Map for the project area

5.5. Ecological Environment

The climatic condition and the prevailing drought condition in the project area have attributed to a limited number of wild-animals in the area. Namibia has about 53 species of rodents, 43 species of bats and 35 species of carnivores. This includes 851 Red Data Book plant species, 685 of which are endemic to this ecoregion (Hilton-Taylor 1996). Many of these species are endangered, largely because they occupy extremely small ranges. Others are becoming increasingly vulnerable to overgrazing, mining activities and illegal harvesting for horticulture. Charismatic species that have declining populations include halfmen, giant quiver trees, and Aloe ramosissima, which were not observed in the project area.

5.5.1. Flora

Arandis is situated on the edge of the Central-Western Plains stretching from the coast to about 450 km to the east which connects the Escarpment. The escarpment divides most of the country into two general landscapes: the low lying coastal plain (which includes Arandis), and the higher inland plateau (Khomomas Hochland to the east of Arandis). The elevation within the project area varies between 547 and 2559 metres. The study area is mainly comprised of four habitat types namely:

- Grassland
- Shrubland; and;



Figure 8: EPL 8024 Vegetation structure

In the Karibib area, the vegetation structure and habitats can vary due to the specific environmental conditions and plant communities present. However, the types of vegetation structures and habitats that can be found in in the project area include:

- **Desert Grasslands:** These are open areas dominated by grass species adapted to arid conditions. They typically have sparse vegetation cover and are often found in flat or gently undulating areas.
- **Thorny Bushveld:** This vegetation type is characterized by the presence of thorny shrubs and small trees, such as Acacia species. It provides habitat and protection for various wildlife species and can be found in areas with slightly higher rainfall.
- **Rocky Outcrops:** These areas consist of exposed rock formations, which provide unique habitats for specialized plant species adapted to rocky environments. These rocky outcrops can support a diverse range of vegetation, including succulents, lichens, and small shrubs.
- **Riparian vegetation:** The vegetation within water courses or river beds is distinctively denser than on the plains. The riverine vegetation is an important feature in the landscape as it provides habitat, sustenance, and shelter for a number of game species, particularly during extended dry periods. However, the riverine vegetation is variable in terms of structure, as the intensity, frequency and duration of rainfall determines the severity of flood periods. The floods also provide corridors for flora species to spread. Many annual species are washed down from the escarpment and colonise the river beds downstream. The lifespan of these species is limited, as they are dependent on a shallow water table.

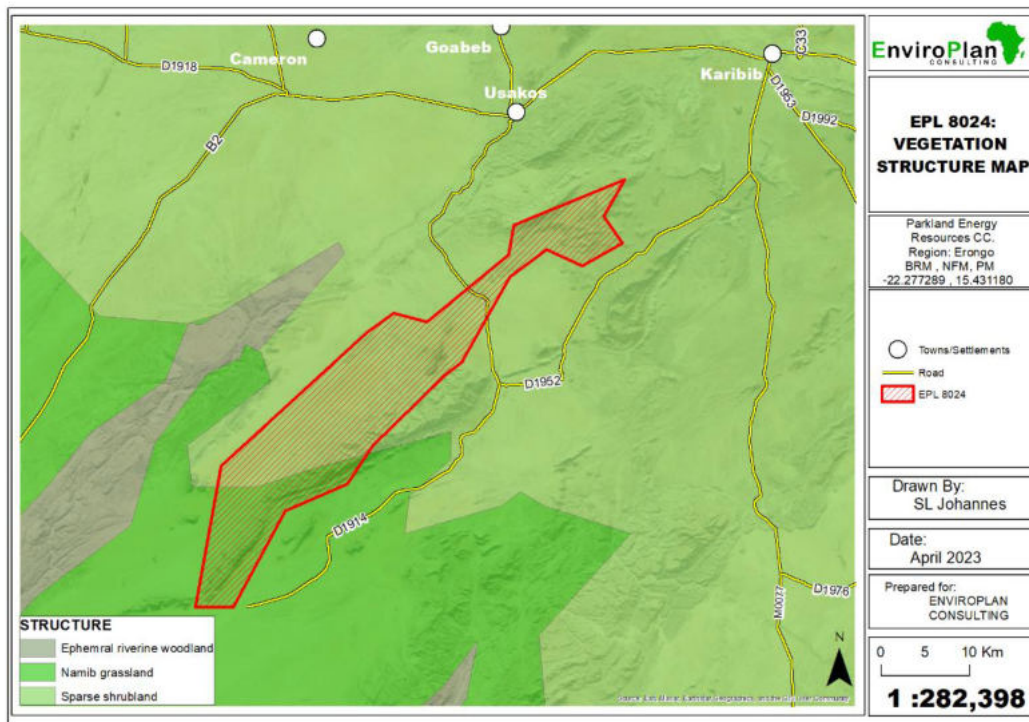


Figure 9: Vegetation Cover Map

5.5.2. Fauna and Habitats

Several vertebrate species have their eastern, western, northern or southern distribution boundaries in the vicinity of the EPL, therefore explaining the high diversity of identified vertebrates. Some of these vertebrates are permanent residents while others are regular commuters or occasional transients. Vertebrates have been identified and described by the specialist according to groups, species and habitats.

In broad terms, the groups of vertebrates include: mammals, reptiles (including inter alia: snakes, skinks, lizards, geckos, and others), frogs and birds. At least 44 species of mammals, 45 species of reptiles, 2 species of frogs and over 200 species of birds occur in and around ML. Of these, 4 species of reptiles are of special conservation significance because they are newly discovered, have limited ranges, and/or very little is currently known about them: the Schieferberg sand lizard, the Damara tiger snake, the Delalande’s blind snake, and the Husab sand lizard.

Approximately 19 core habitats were identified, however the habitats in the EPL area can be broadly divided into three broad habitat types, namely:

- Rocky Hillsides: Least vegetated habitat due to the very shallow soils or no soil, and loose surface rocks.
- Open Plains: Features scattered bushes and shrubs due to the deeper soils. The plains are interrupted with rocky outcrops of varying sizes.
- Watercourses: More vegetation in the form of larger bushes and trees along the length of the course, due to the more frequent availability of water. Water is usually only available for short periods of time. The soil is usually sandy and loose.

5.5.3. Reptiles

The proposed project falls within the vicinity of the Namib Karoo and it has a relatively diverse species of reptile and some species are endemic to the country. The following are the reptile species likely to occur in the general area.

Table 7: List of reptiles likely to occur in the project area

Scientific name	Common name	Occurrence (✓)	Conservation Status
<i>Rhinotyphlop schlegelii</i>	Schlegel’s Beaked Blind Snake	✓	-
<i>Leptotyphlops occidentalis</i>	Western Thread Snake	✓	-
<i>Leptotyphlops labialis</i>	Damara Thread Snake	✓	-

<i>Leptotyphlops pungwensis</i>	Pungwe Thread Snake	✓	Endemic
<i>Python anchietae</i>	Anchieta's Dwarf Python	✓	-
<i>Python natalensis</i>	Southern African Python	✓	-
<i>Atractapis bibronii</i>	Southern or Bibron's Burrowing Asp	✓	-
<i>Xenocalamus bicolor</i>	Bicoloured Quill-snouted Snake		-
<i>Lamprophis fuliginosus</i>	Brown House Snake	✓	-
<i>Lycophidion capense</i>	Cape Wolf Snake	✓	-
<i>Lycophidion namibianum</i>	Namibia Wolf Snake	✓	Endemic
<i>Pseudapsis cana</i>	Mole Snake	✓	-
<i>Pythonodipsas carinata</i>	Western Keeled Snake	✓	-
<i>Dipsina multimaculata</i>	Dwarf Beaked Snake		
<i>Psammophylax tritaeniatus</i>	Striped Skaapsteker	✓	-
<i>Psammophis trigrammus</i>	Western Sand Snake	✓	Endemic
<i>Psammophis notostictus</i>	Whip Snake	✓	-
<i>Psammophis namibensis</i>	Namib Sand Snake	✓	-
<i>Psammophis leopardinus</i>	Leopard Grass Snake	✓	Endemic
<i>Philothamnus semivariegatus</i>	Spotted Bush Snake	✓	
<i>Dasypeltis scabra</i>	Common or Rhombic Egg Eater	✓	-
<i>Diospholidus typus</i>	Boomslang	✓	-
<i>Aspidelaps infuscatus</i>	Coral Snake	✓	Endemic
<i>Aspidelaps scutatus</i>	Shield –nose Snake	✓	-
<i>Naja annulifera</i>	Snouted Cobra	✓	-
<i>Bitis arietans</i>	Puff Adder	✓	-
<i>Bitis caudalis</i>	Horned Adder	✓	-
Lizards			
<i>Zygaspis quadrifrons</i>	Kalahari Rounded Worm Lizard	✓	-
<i>Heliobolus lugubris</i>	Bushveld Lizard	✓	-
<i>Meroles suborbitalis</i>	Spotted Desert Lizard	✓	-

<i>Pedioplanis namaquensis</i>	Namaqua sand Lizard	✓	-
<i>Cordylosaurus subtessellatus</i>	Dwarf plated Lizard	✓	-
Skinks (Scincidae)			
<i>Mabuya capensis</i>	Cape Skink	✓	-
<i>Mabuya hoeschi</i>	Hoesch's Skink	✓	Endemic
<i>Mabuya occidentalis</i>	Western Three-Striped Skink	✓	-
<i>Mabuya spilogaster</i>	Kalahari Tree skink	✓	-
<i>Mabuya wahlbergii</i>	Striped Skink	✓	-
<i>Mabuya walbergii</i>	Striped Skink	✓	-
<i>Mabuya sulcata</i>	Western Rock Skink	✓	-
<i>Mabuya variegata</i>	Variegated Skink	✓	-
Monitors (Varanidae)			
<i>Varanus albigularis</i>	Rock or White-throated monitor	✓	-
Agamas (Agamidae)			
<i>Agama anchietae</i>	Anchietae Agama	✓	-
<i>Agama planiceps</i>	Namibian Rock Agama	✓	Endemic
Chameleons (Chamaeleonidae)			
<i>Chamaeleo namaquensis</i>	Namaqua Chameleon	✓	-
<i>Lygodactylus bradfieldi</i>	Bradfield's Dwarf Gecko	✓	Near – Endemic
<i>Pachydactylus bicolor</i>	Velvety Thick-toed Gecko	✓	Endemic
<i>Pachydactylus capensis</i>	Cape Thick-toed Gecko	✓	-
<i>Pachydactylus turneri</i>	Turner's Thick-toed Gecko	✓	-
<i>Pachydactylus punctatus</i>	Speckled Thick-toed Gecko	✓	-
<i>Pachydactylus rugosus</i>	Rough Thick-toed Gecko	✓	-
<i>Pachydactylus weberi</i>	Weber's Thick-toed Gecko	✓	-
<i>Ptenopus garrulous</i>	Common barking Gecko	✓	-

The general area has a relatively high species diversity of reptiles of which some are endemic to Namibia. Among the species occurring in the general area, 7 species are endemic to Namibia and

only 1 species is recorded in the area which is Near-endemic. Myriad of reptile species known to occur in the area are of no conservation concern.

5.5.4. Avian-Fauna

Namibia is projected to harbour about 676 bird species; which includes about 30% of birds in Africa and 6% of the global avian fauna. Birdlife in the proposed area is considered to be relatively high due to micro-habitants such as the watercourse area occurring in the area. The following are the birds recorded in the area during the site visit and it was augmented with the use of Kenneth Newman, 2000. Newmans Birds By Colour, Southern Africa Common Birds. Arranged by Colour, Struik New Holland Publishing (Pty) Ltd 2000. Since birds have no trans-boundaries this list is not exhaustive.

Table 8: List of Avian-Fauna likely to occur in the project area

Scientific name	Common name	Status in Namibia
<i>Struthio camelus australis</i>	Ostrich	-
<i>Coturnix coturnix</i>	Common Quail	-
<i>Coturnix delegorguei</i>	Harlequin Quail	-
<i>Numida meleagris</i>	Helmeted Guineafowl	-
<i>Campethera bennettii</i>	Bennet's Woodpecker	-
<i>Campethera abingoni</i>	Golden-tailed Woodpecker	-
<i>Tockus monteiri</i>	Monteiro's Hornbill	Endemic
<i>Tockus damarensis</i>	Damara Hornbill	Endemic
<i>Tockus leucomelas</i>	Southern yellow-billed Hornbill	-
<i>Tockus nasutus</i>	African Grey Hornbill	-
<i>Upupa Africana</i>	African Hoopoe	-
<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe	-
<i>Coracias garrulous</i>	European Roller	Near-Threatened
<i>Coracias naevius</i>	Purple Roller	-
<i>Merops hirundineus</i>	Swallow-tailed Bee-eater	-
<i>Urocolius indicus</i>	Red-faced Mousebird	-
<i>Cypsiurus parvus</i>	African Palm Swift	-
<i>Tachymarptis melba</i>	Alpine Swift	-

Scientific name	Common name	Status in Namibia
<i>Apus bradfieldi</i>	Bradfield's Swift	-
<i>Falco rupicolus</i>	Rock Kestrel	-
<i>Falco rupicoloides</i>	Greater Kestrel	-
<i>Corvus albus</i>	Pied Crow	-
<i>Lanius collaris</i>	Common Fiscal	-
<i>Hirundo albigularis</i>	White-throated Swallow	-
<i>Hirundo dimidiata</i>	Pearl-breasted Swallow	-
<i>Hirundo cucullata</i>	Greater Stiped Swallow	-
<i>Hirundo semirufa</i>	Red-breasted Swallow	-
<i>Pycnonotus nigricans</i>	African Red-eyed Bulbul	-
<i>Achaetps pycnopygius</i>	Rockrunner	Endemic
<i>Cisticola jaridulus</i>	Desert Cisticola	-
<i>Passer domesticus</i>	House Sparrow	-
<i>Passer motitensis</i>	Great Sparrow	Near-Endemic
<i>Passer melanurus</i>	Cape Sparrow	Near-Endemic
<i>Serinus flaviventris</i>	Yellow Canary	-
<i>Serinus alario</i>	Black-headed Canary	Endemic

The potential impact on the avian fauna during construction will be trampling of the nesting sites in the watercourse areas, where bird nests will more likely be found. This will impact the breeding chances of the birds and cause mortality. But due to the small number of nests observed and wide distribution of bed nests, this impact will be low.

5.6. Culture and Heritage (HAIA in Annexure C)

The site surveys undertaken is reported in annex C with key finding.

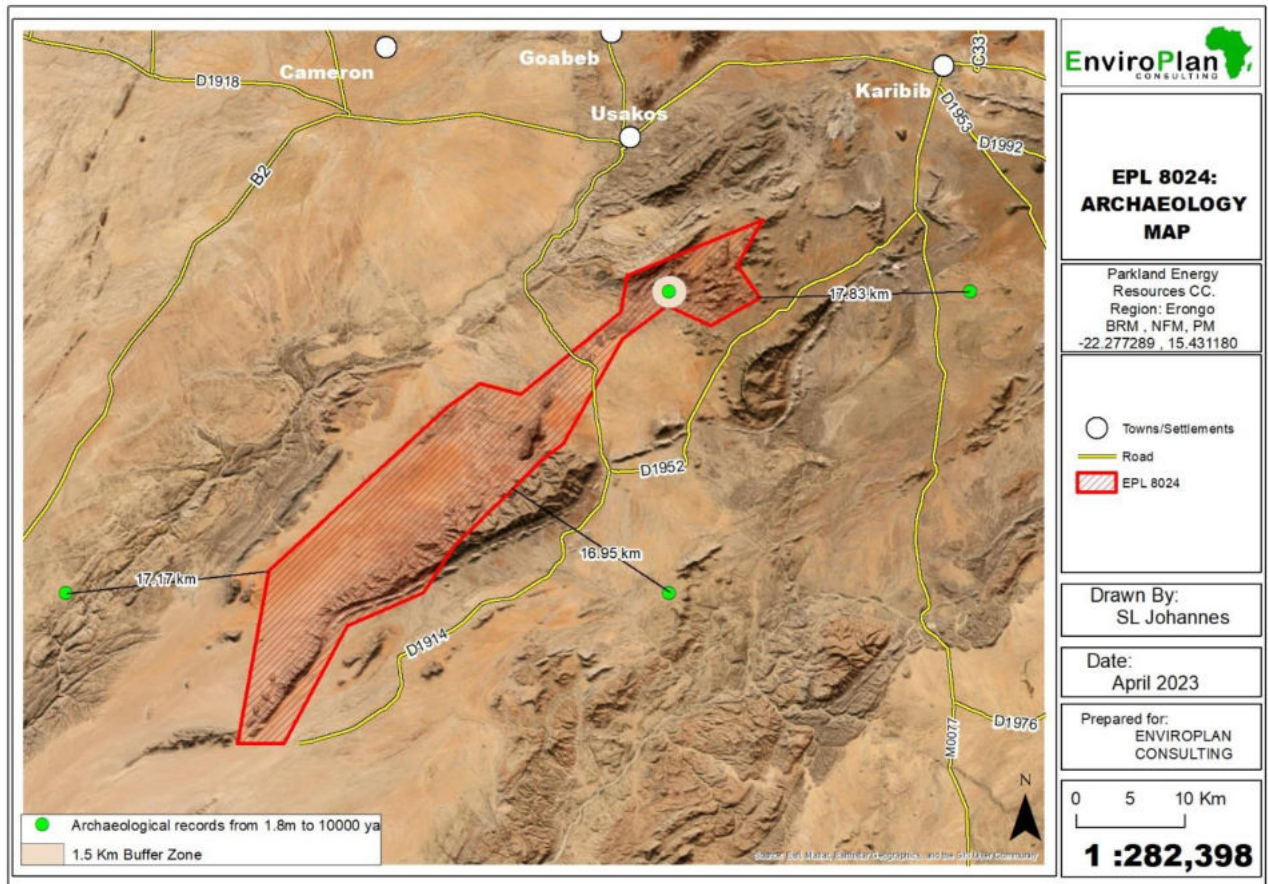


Figure 10: Culture and Heritage Sensitivity

6. CHAPTER SIX: PUBLIC CONSULTATION

6.1. Overview

Chapter Six of the document focuses on the importance of public consultation in the Environmental Assessment (EA) process. Public and stakeholder involvement is crucial in gathering feedback, addressing concerns, and considering the perspectives of interested and affected parties (I&APs). The public consultation process adheres to the requirements outlined in the Environmental Management Act (EMA) and its EIA Regulations.

The purpose of public consultation is to ensure that all potential impacts of the project are identified and adequately investigated. By engaging with stakeholders, the Environmental Assessment Practitioner (EAP) can gather valuable insights and information, helping to assess the project's effects and identify appropriate mitigation measures.

The public consultation process may involve various activities such as public meetings, stakeholder interviews, and the dissemination of relevant project information. It aims to facilitate dialogue, enable stakeholders to express their concerns and opinions, and assist in the identification of potential impacts and mitigation measures.

6.2. Approach

6.2.1. *Interested and Affected Parties (I&APs)*

An I&P is defined under the Environmental Management Act (2007) as:

- “Any person, group of persons or organization interested in or affected by an activity; and
- (b) Any organ of state that may have jurisdiction over any aspect of the activity”.

EnviroPlan identified specific I&APs, whom were considered interested in and/or affected by the proposed activities through the following means:

- Information for the applicable local authorities was obtained from the existing GCS stakeholder database;
- Notification letters and/or emails were sent to those possibly interested and affected by the proposed project; and
- Notices were placed in the local newspapers requesting any potentially affected or interested members of the public to register as I&APs.

The document provides a summary of the Interested and Affected Parties (I&APs) identified during the consultation process. A condensed overview of these I&APs is presented in Table 9. Additionally, Table 10 provides a list of farms that fall thin EPL 8024. For a comprehensive list of all the identified

I&APs, including additional information about their engagement and concerns, please refer to Appendix A.

Table 9: Summary of Identified IAPs

List of IAPs	Description
	Ministry of Environment and Tourism
	Erongo Regional Council
	Arandis
	Local community members/ farmers

Table 10: summary of farms falling within the EPL 8024 block

6.2.2. Communication with I&APs

Formal public involvement has taken place via newspaper adverts, site notice, registering I&APs, mail/email notification and door to door consultation. The public consultation process has been guided by the requirements to ensure compliance with Regulation 21 of the EIA Regulations. The details and outcomes of these meetings can be found in Appendix A.

Table 11: Consultative engagement conducted

Date	Activity	Venue/Place
07.04.23	Door-to-door Consultative Meeting	Farms within the EPL

- A Background Information Document (BID) containing descriptive information about the proposed activities was compiled (Appendix D) and sent out to all identified and registered I&APs;
- Site notices were fixed at conspicuous locations in Karibib, and Project area (see Appendix A); and

Public consultation was carried out according to the Environmental Management Act’s EIA Regulations. After the initial notification, the I&APs were given three weeks to submit their comments on the project until 26 April 2023. The comment period will remain open until the final scoping report is submitted to MET.



Figure 11: Door-to-door consultation

6.3. Printed Media

6.3.1. Background Information Document

A Background Information Document (BID) was drafted at the onset of the EA process to act as a useful information handout about the proposed road upgrade project. In addition, the BID provided details on the public consultation process with contact details for further information. This document was advertised for availability through various means of newspaper articles, public meeting and electronic mail; see Appendix A of this document.

6.3.2. Newspaper Advertisements & Articles

Newspaper notices about the proposed project and related EA processes was circulated in two newspapers for two weeks. Notices were placed in The Windhoek Observer and Confidante newspapers, briefly explaining the activity and its locality, and inviting members of the public to register as I&APs (Appendix A).

Table 12: Newspaper & Site Notices (APPENDIX A)

Newspaper	Area of Distribution	Language	Date placed
Windhoek Observer (Refer to APPENDIX A)	Country Wide	English	6-7 March 2023
The villager (Refer to APPENDIX A)	Country Wide	English	8 March 2023
Site notice	Usakos (Notice board), Karibib (Ok notice board), farm gates within EPL	English,	07 April 2023
Notification via mail (Refer to APPENDIX A)	Mailed to farmers within the EPL	English	20 April 23
Notification via email (Refer to APPENDIX A)	Emailed to farmers within the EPL	English	17 April 23

6.3.3. Building a Stakeholder Database

A stakeholder database for the project collected through a variety of means. During the advertisement of the project (through public notices in local newspapers and site-notices) the list was augmented as Interested & Affected Parties (I&AP) registered and contact information of stakeholders updated, please refer to Appendix A.



Figure 12: Public Consultation Notification Poster

6.3.4. Comments and review period

Various stakeholders have registered and provided comments from the onset of the public consultation process and the initial information sharing through the BID, newspaper and site notices.

The public commenting period from the First Newspaper advert spanned for 30 Man days and the Scoping Report and Environmental Management Plan was made available to the public and stakeholders for comment and review.

Comments and proof of stakeholder’s engagement are attached in appendix A of this ESR. However, the response rate was low, with only two response received:

- Mr Hansie Kries from Wolfkoppe farm is not in favour of the project as it will adversely affect their investment and game on the farm. The ESMP addresses this and it also identified

sensitive areas. There will be non-invasive exploration to ensure sustainable harmonisation with exploration and biodiversity.

- Mr. Saayman would like a proforma forms to be sent out to him and other stakeholders (landowners) to provide permission to Enviroplan Consulting CC to access their farms, and add comments and conditions for access. However this was already distributed to them, proof is attached in appendixes A.

The details and outcomes of this stakeholder engagement are documented in Appendix A of the Environmental and Social Report (ESR).

6.4. Conclusion

EnviroPlan concludes that the public participation was extensive and transparent enough to ensure any comments or issues regarding the proposed development were addressed and to suggest possible mitigation measures.

7. CHAPTER SEVEN: ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

7.1. Overview

The planned activities within the project have the potential to affect various biophysical and social aspects. These potential impacts were evaluated based on their likelihood of occurrence, spatial scale, severity, and temporal scale, as outlined in Tables 14, 15, 16, and 17. In order to systematically assess the environmental significance of these impacts, a numerical value has been assigned to each rating category. This standardized approach allows for consistent and comparable analysis of a wide range of potential impacts.

It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following process will be applied to each potential impact:

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

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment.

The following criteria were applied in this impact assessment:

7.1.1. Extent (spatial scale)

Extent is an indication of the physical and spatial scale of the impact. Table 13 shows rating of impact in terms of the extent of spatial scale.

Table 13: Extent or spatial impact rating

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

7.1.2. Duration

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. Table 14 shows the rating of impact in terms of duration.

Table 14: Duration of Impact

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

7.1.3. Intensity, magnitude / severity

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These were also taken into consideration during the assessment of severity. **Table 15** shows the rating of impact in terms of intensity, magnitude or severity.

Table 15: Intensity, magnitude and severity of impact

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

7.1.4. Probability of occurrence

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or professional judgment. See Table 8-4 for impact rating in terms of probability of occurrence.

Table 16: Probability of occurrence impact rating

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

7.1.5. Significance

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

Once the above factors (Table 14, Table 15, Table 16 and Table 17) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (Table 18).

Table 17: Significance rating scale

SIGNIFICANCE	ENVIRONMENTAL SIGNIFICANCE POINTS	COLOUR CODE
High (positive)	>60	H
Medium (positive)	30 to 60	M
Low (positive)	<30	L

Neutral	0	N
Low (negative)	>-30	L
Medium (negative)	-30 to -60	M
High (negative)	>-60	H

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

The impact assessment for the proposed activities is given below.

7.2. Exploration Phase Impact Assessment

The Exploration phase primarily involves site preparation activities such as establishing access roads, drilling sites, and camping areas. During this phase, there are potential impacts that need to be considered, including the loss of biodiversity as a result of site clearing and preparation. Additionally, activities such as dust and noise generation may also occur. These impacts are associated with the initial stages of exploration and should be carefully assessed and mitigated to minimize their potential negative effects on the environment.

7.3. Impact Assessment of Biodiversity Loss

A number of indigenous trees are located along the mountain and riverine areas. Some vegetation may need to be removed for exploration and accessibility. This may also lead to habitat destruction for some fauna. As such, care should be taken during the removal of vegetation for site preparation to ensure minimal disturbance in the area. The envisaged impact at the project site is thus not of such magnitude and/ or significance that it will have irreversible impacts on the biodiversity and endemism of the area and Namibia at large. The pre- mitigation impact is assessed to be “medium” in significance and after mitigation the impact is assessed to have a “low” significance. The assessment of this impact is presented in Table 18.

Table 18:Assessment of the impacts on biodiversity loss

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	L/M - 5	M - 6	M – 3	M - 42

Post-mitigation	L - 1	L- 1	L- 2	L - 1	L-4
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7.3.1. Mitigations and recommendations to biodiversity loss

- Large indigenous trees on site need to be identified, marked, surveyed and are not to be removed or damaged.
- Trees with a trunk size of 150 mm and bigger should be surveyed, marked with paint (readily visible) and protected.
- Protected tree species as per the Forest Act No 12 of 2001 and Forest Regulations of 2015 may not be removed without a permit from the Ministry of Agriculture, Water and Forestry.
- Workers should be trained on the importance of conserving trees during construction activities and should be sensitised to be vigilant against any practice that will have a harmful effect on vegetation.

7.4. Impact Assessment of Dust Generation

Site clearing and drilling activities may lead to the generation of dust which could impact the local communities and businesses negatively, if not properly handled. This may pose a negative health impact on the surrounding communities. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 19.

Table 19: Assessment of the impacts of dust generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	L/M - 5	M - 6	M – 3	M - 27
Post-mitigation	L - 1	L- 1	L- 2	L - 1	L-4

7.4.1. Mitigations and recommendations to dust generation

- Dust abatement techniques should be implemented e.g. spraying of water on site to reduce dust levels to an acceptable standard.
- The local community and surrounding businesses should be continuously consulted to ensure that the dust levels are acceptable.
- Community members and businesses should be informed prior to any clearing of vegetation commencing so that they are aware of the planned work.

- During high wind conditions, the contractor must make the decision to cease works until the wind has settled.
- Stockpiles should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

7.4.2. Mitigations and recommendations to noise generation

Site preparation activities should be limited to daytime hours (between 08h00 and 17h00) unless otherwise arranged with community members and businesses in the area.

7.5. Impact Assessment on Environmental Degradation

During exploration different types of waste may be generated on-site. This may include general waste as well as hazardous chemicals and hydrocarbons which may cause degradation of the subject environment if not correctly managed and contained. Furthermore, the presence of the workforce and machinery may enhance environmental destruction within the subject site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 20.

Table 20: Assessment of impacts on environmental degradation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 3	M - 4	M - 4	M - 32
Post-mitigation	L - 1	L- 1	L- 2	L - 1	L-4

7.5.1. Mitigations and recommendations to environmental degradation

- All types of waste should be effectively managed on site.
- Hazardous substances and hazardous waste materials should be carefully and correctly handled and stored on site according to guidelines in the EMP.
- Contractors should be trained on the importance of protecting the environment.
- Contractors should be trained on EMP compliance and sensitized to ensure that they respect and protect the environment during the work.

7.6. Impact Assessment of Waste Generation

Exploration activities usually generate waste which may lead to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water pipelines; animals may choke on waste when ingested and additionally it may pose a negative visual impact on the surrounding environment. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to a “low” rating. The assessment of this impact is presented in Table 21.

Table 21: Assessment of Impacts on Waste generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 3	M - 4	M - 4	M - 32
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

7.6.1. Mitigations and recommendation to waste generation

- The construction site should be kept tidy at all times.
- All domestic and general construction waste produced on a daily basis should be cleaned and contained.
- No waste may be buried or burned on site or anywhere else.
- Waste containers (bins) should be emptied during and after the construction and the waste removed from site to the municipal waste disposal site on a covered vehicle (to prevent waste blowing off the vehicle into the environment).
- Separate waste containers (bins) for hazardous and domestic / general waste must be provided on site.
- Construction labourers should be sensitised to dispose of waste in a responsible manner and not to litter.
- No waste may remain on site after the completion of the project.
- The recycling of waste should be considered and implemented as far as possible.

7.7. Impact Assessment of Soil, Surface and Groundwater

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to soil, surface and groundwater contamination, in case of spills and leakages. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 22.

Table 22: Assessment of the impacts on soil, surface and groundwater

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 3	L/M - 4	M - 6	M - 4	M - 52
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

7.7.1. Mitigations and recommendation to soil, surface and groundwater

- Careful storage and handling of hydrocarbons on site is essential.

- Workers responsible for the storage and handling of hydrocarbons should be suitably trained to do so and trained on spill prevention (e.g. the use of drip trays) and the handling of potential spills should they occur, to be able to ensure implementation on site.
- Potential contaminants such as hydrocarbons and wastewater should be contained on site and disposed of in accordance with municipal wastewater discharge standards so that they do not contaminate surrounding soils, surface water and eventually groundwater.
- An emergency plan should be available for major / minor spills at the site during operation activities (with consideration of air, groundwater, soil and surface water) and during the transportation of the product(s) to the site.

7.7.2. Mitigations and recommendations to dust generation

- Dust abatement techniques should be implemented e.g. spraying of water on site to reduce dust levels to an acceptable standard.
- The local community and surrounding businesses should be continuously consulted to ensure that the dust levels are acceptable.
- Community members and businesses should be informed prior to construction commencing so that they are aware of the planned construction.
- During high wind conditions the contractor must make the decision to cease works until the wind has settled.
- Stockpiles and sand being transported should be covered with plastic to reduce windblown dust.
- Workers should be provided with dust masks.

7.8. Impact Assessment of Noise Generation

Exploration activities and the presence of construction vehicles may lead to the generation of noise which could impact the local communities and animals negatively, if not properly handled. This may pose a disturbance on the surrounding communities. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 26.

Table 23: Assessment of the impacts of noise generation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	L/M - 2	M - 6	M - 3	M - 27
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

7.8.1. Mitigations and recommendation to noise generation

- Construction activities should be limited to daytime hours (between 08h00 and 17h00) unless otherwise arranged with community members and businesses in the area.

- No amplified music should be allowed on site.
- Technology such as silencers should be installed on construction machinery.
- The use of horns as a general communication tool should not be allowed, they should only be used when necessary, as a safety measure.

7.9. Impact Assessment of Archaeological and Heritage Resources

The proposed construction activities is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the upgrade activities, mitigation measures need to be in place to ensure that these resources are not harmed. Memorial sites were identified along the road which are to be preserved during the proposed upgrade. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 24.

Table 24: Assessment of the impacts on archaeological and heritage resources

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 1	L/M - 4	M - 6	M - 1	M - 11
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

7.9.1. Mitigations and recommendation to archaeological and heritage resources

- All works are to be immediately ceased in an affected area should an archaeological or heritage resource be discovered.
- The National Heritage Council of Namibia (NHCCN) should advise with regards to the removal, packaging and transfer of the potential resource.

7.10. Impact Assessment of Temporary Employment Creation

The proposed activity may provide employment opportunities for the local people. Additional benefits may arise depending on the agreements reached between the community and the Proponent. The impact can be rated as of a “low-positive” significance. The assessment of this impact is presented in Table 26.

Table 25: Assessment of impacts on temporary employment creation

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M + 2	L/M + 2	M + 2	M + 3	L+ 18
Post-mitigation	L + 4	L+ 3	L+ 2	L + 3	L + 27

7.10.1. Recommendations for temporary employment creation

- Should any job opportunities result, they should be made available to the local people in the area as far as reasonably possible.
- Should materials or resources be sourced from communities, they should be sufficiently compensated in a manner agreed between the community and the proponent/contractor.

7.11. Impact Assessment of Health, Safety and Welfare

Mineral exploration and construction may cause health and safety risks to people operating on the site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to “low” rating. The assessment of this impact is presented in Table 27.

Table 26: Assessment of impacts on health, safety and welfare

	Extent	Duration	Intensity	Probability	Significance
Pre-mitigation	L/M - 2	L/M - 2	M - 6	M - 3	M - 27
Post-mitigation	L - 1	L - 1	L - 2	L - 1	L-4

7.11.1. Mitigations and recommendations to health and safety

- Employees should be provided with awareness training about the risks associated with the proposed upgrade work such as hydrocarbon handling and storage, the handling of heavy machinery etc.
- During the works conducted, workers should be properly equipped with personal protective equipment (PPE) such as coveralls, gloves, safety boots, safety glasses etc.
- The contractors should comply with the provisions with regards to health and safety as outlined in the Labour Act (No. 6 of 1992).
- The contractor should ensure that road safety is prioritised during the road upgrade phase. Detours and temporary access should have adequate signage and safety considerations.

8. CHAPTER EIGHT: RECOMMENDATIONS AND CONCLUSION

8.1. Conclusion

The key potential biophysical impacts related to the mineral exploration and decommissioning phases of the proposed project were identified and assessed. Suitable mitigation measures (where required and possible) were recommended, and the impacts can be summarised as follows:

8.1.1. Impacts on biodiversity:

There are some large indigenous trees that may be affected, As such, no vegetation removal is recommended, unless a permit is issued by DEAF to ensure minimal disturbance in the area. The likelihood of this impact is low. However, the impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.1.2. Impacts on environmental degradation:

Mineral exploration may result in hydrocarbons which may cause degradation of the subject environment. Furthermore, the presence of the workforce and machinery may aid in environmental destruction within the subject site. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations management actions given in the EMP.

8.1.3. Impacts on waste generation:

Construction and exploration activities usually generate waste, which leads to environmental pollution, if not properly handled. This may result in blocked waterways should waste be blown into water pipelines, animals may choke on waste when ingested and it may pose a negative visual impact on the surrounding environment. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.1.4. Impacts on soil, surface and groundwater contamination:

Improper handling, storage and disposal of hydrocarbon products and hazardous materials at the site may lead to spills and leakages which could cause soil, surface and groundwater contamination. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.1.5. Impacts on dust generation:

Site clearing, construction activities and the presence of construction vehicles may lead to the generation of dust which could impact the local communities negatively, if not properly handled. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigation measures, the impact will be significantly

reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.1.6. Impact on noise generation :

Site clearing, construction, exploration and existence of heavy vehicles may lead to the generation of noise which could impact the local communities negatively, if not properly handled. This may pose a disturbance on the surrounding communities. Without any mitigation measures implemented, the impact can be rated as of a “medium” significance. After the implementation of the mitigations, the impact will be significantly reduced to low rating. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.1.7. Impact on archaeological and heritage resources (during construction phase):

The proposed activity is not taking place in an area that has significant archaeological or heritage resources. However, should these be encountered during the construction activities, mitigation measures need to be in place to ensure that these resources are not harmed. The impact can be adequately addressed by the recommendations and management actions given in the EMP.

8.2. Recommendation

Based on the information provided in this report, EnviroPlan is confident the identified risks associated with the proposed project can be reduced to acceptable levels, should the measures recommended in the EMP be implemented and monitored. It is therefore recommended that the project receive Environmental Clearance, provided that the EMP be implemented.

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