

# Environmental & Social Impact Assessment: The Proposed Mineral Exploration Activities on EPL 8298, Trekopje, Erongo Region -Namibia

## Environmental Scoping Report (ESR)



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## ACRONYMS

<b>TERMS</b>	<b>DEFINITION</b>
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 Namibia Uranium Pty Ltd on behalf of **Sion Dimbulukweni Mwatukange** to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the proposed base metals exploration activities on EPL 8298 in Trekopje area, Erongo region and to apply for an Environmental Clearance Certificate for the proposed activity.

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 generally expected to improve the socio-economic environment of Arandis - Trkepje- Spitzkoppe area through a major boost in business by means of integrations, employment and an improved transport system on the long term. Interested and Affected Parties were notified of the project through site notices and newspaper adverts and all relevant information on the consultation is covered in Chapter 4 of this document and Appendix A of the document.

### **Recommendation**

It is concluded that most of the impacts identified during this Environmental Assessment can be addressed through the recommended mitigation and management actions for the proposed mineral exploration activities.

Should the recommendations included in this report and the EMP be implemented the significance of the impacts can be reduced to reasonably acceptable standards and durations. All developments could proceed provided that general mitigation measures as set out are implemented as a minimum.

In this respect, it is recommended that the proposed mineral exploration activities receives approval and receive Environmental Clearance, provided that the recommendations described above and the EMP are implemented.

## 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 purposes 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

The proponent, **Sion Dimbulukweni Mwatukange** has identified the economic potential of mineral deposits found in the Erongo Region. The proponent is a holder of a licence to explore a land area of 17411.2 hectares (ha). The area covered by the Exclusive Prospecting Licence (EPL 8298), falls within communal land. Namibia Uranium (NU) (PTY) LTD currently holds access to the mineral rights on EPL 8298, In this respect, NU and the proponent plans to undertake mineral exploration activities, primarily targeting uranium ore deposits.

As per the requirements of the Namibian environmental legislation (Environmental Management Act (No. 7 of 2007 and the Environmental Impact Assessment Regulations of 2012), an EIA is required to obtain an Environmental Clearance Certificate from the Ministry of Environment and Tourism (MET) before the project can proceed. This is because under the 2012 Environmental Impact Assessment (EIA) Regulations of the Environmental Management Act (EMA) No. 7 of 2007, mineral exploration is a listed activity that may not be undertaken without an Environmental Clearance Certificate (ECC). This activity is listed under the following relevant sections:

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

ACTIVITY	RELEVANT SECTIONS
<p><b>MINING AND QUARRYING ACTIVITIES</b></p>	<ul style="list-style-type: none"> <li>- 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.</li> <li>-3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.</li> <li>-3.3 Resource extraction, manipulation, conservation and related activities.</li> </ul>

## 1.2. The Environmental Consultant

Namibia Uranium has appointed EnviroPlan Consulting cc as the appointed Environmental Consultant to conduct an Environmental Impact Assessment (EIA) and develop an Environmental Management Plan (EMP) for the undertaking of mineral exploration activities and to apply for an Environmental Clearance Certificate with the Directorate of Environmental Affairs.

### 1.3. Project Location

EPL 8298 block is located in western Namibia, Erongo Region as part of the Brandberg-Erongo mining district (Fig 1).

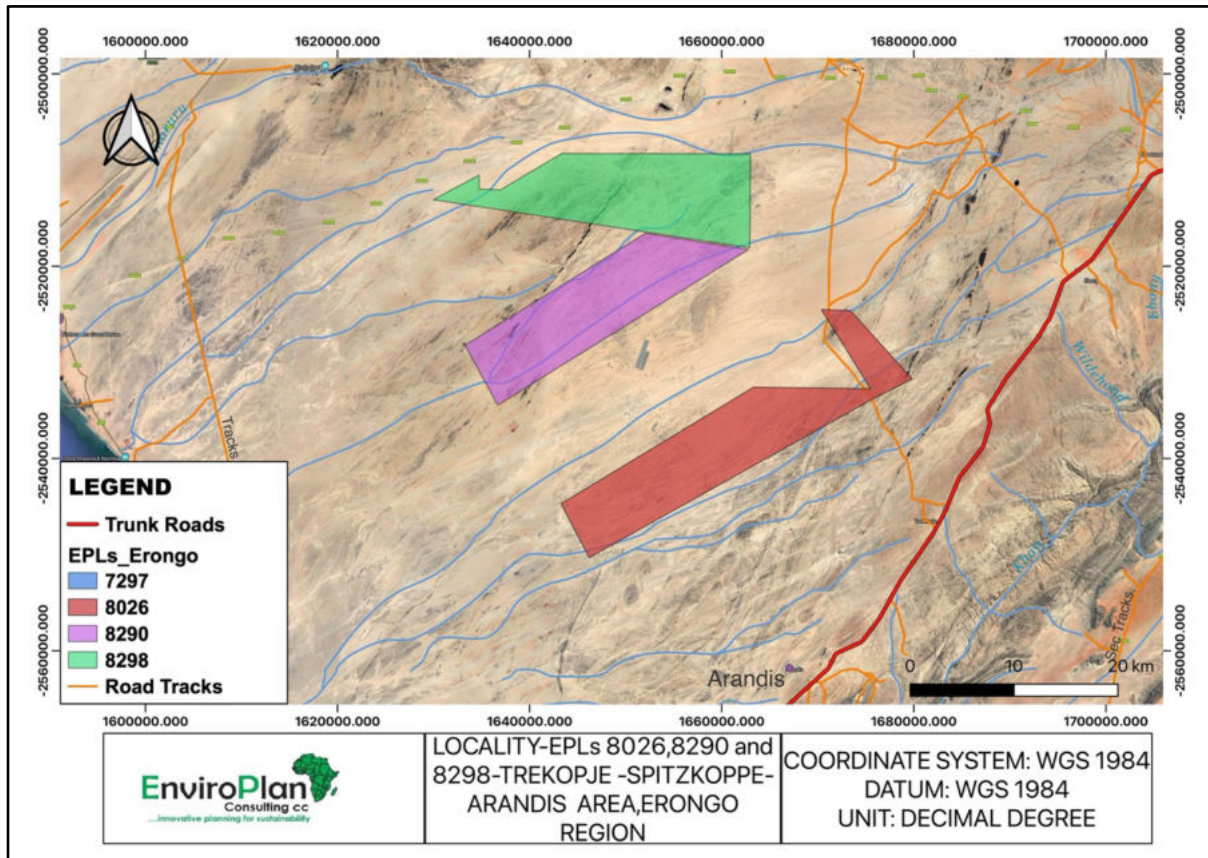


Figure 1: EPL 8298 Locality.

### 1.4. Need and Desirability of the Project

Namibia’s economic model continues to be influenced by the exploitation of mineral resources. According to the National Planning Commission Report (2021), the average contribution of the mining sector to GDP between 1990 and 2018 is significant and favourably stand at 11.1 %. Mining remains the largest earner of Namibia’s foreign exchange at about 45%. Mineral prospecting is enshrined in National Development Plan (NDP V), Vision 2030. The Harambee Prosperity Plan II plan (Pillar 2) place emphasis on economic advancement with view to enhance the productivity of priority sectors such as mining. However, mining development can be constraint by insufficient investment in mining exploration. The project inherently promote economic socio- advancement through employment creation. The 2018 Labour Force Survey 2018 indicates that mining employs 1.7% of the total employed persons (NSA, 2019). Mining exploration is thus encouraged so that the sector can contribute more to the Namibian economy (NPC, 2021).

Erongo Region despite mining activities, it still ranks low and falls within the category of least of developed administrative regions in Namibia. The proposed project presents an interesting prospect for expanding mining opportunities in the region. Living conditions are expected to increase through economic spinoffs/investments. Equally the proposed development can have an impact on direct and induced employment realized through the supply chain, and provision of support services. Direct and indirect jobs will manifest due to the out-sourcing of short-term services (maintenance, transportation) to sub-contractors. Highly skilled workforce may be sourced from the broader region. Based on the assumption that exploration takes place over a period of 12 months, this can create additional income for local and distant communities alike. However, the impact of exploration is expected to be felt at household level with people in fulltime employment. The positive impact of job creation is considered to be of high significance due to the high unemployment prevalence rate amongst unskilled or semi-skilled population group of the Region.

### 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 submitting an application 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**

<b>Description</b>	<b>Section of the Report</b>
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)

Access agreements will guide the working relationship between landowners and exploration team. The exploration team will undertake initial site visits to identify appropriate sites for the establishment of field camps. The field camps are for the safe keep of exploration equipment and vehicles before use. No employees will be housed in the EPLs. Site preparation activities will begin once surface drainage and ground water conditions are understood by. Exploration will only commence after ecological sensitive areas are known and agreed jointly with landowners.

*Land clearing:* Small land parcels will be cleared for the establishment of base or field camps and staging areas. Proponent shall ensure that areas identified are those that present minimal disturbance to the natural environment and wildlife.

*Creation of access routes and haul tracks:* Apart from the existing farm roads network leading to target areas, additional tracks (extensions from farm roads) may be created. Additional roadways may be considered for the purposes of accessing target sites. Where deemed necessary, graveling, and compaction of vehicle track's surfaces may be considered to allow for less track maintenance and seam less flow of traffic. No roads of bitumen standard exist in the EPL area. No permanent structures will be built for exploration works.

*Fencing:* Where deemed feasible, fences will be erected around field camps and target areas. Fencing will serve to keep out livestock from target sites

### 2.1.2. Operational Phase

The phase typifies an advance level of exploration. Sampling will serve to validate prior exploration results of the mineral deposits. The appropriateness of bulk sample will be related to the deposit morphology. Minerals exploration drilling methods – auger, air-core and diamond core drilling.

Drilling is used to obtain detailed information about rock types, mineral content, rock fabric and the relationship between the rock layers close to the surface and at depth. The following exploration methods will be considered:

**Air-core drilling** is a specialized reverse circulation drilling where a small, annular bit is used to cut a solid core of rock from relatively soft or easily broken material. The bit produces short sections of core which are recovered, along with broken rock chips, up the centre of the drill stem in the manner of a standard reverse circulation rig. The system is often capable of penetrating and coring soft sticky clays with might bind a normal blade bit.

**Diamond core drilling** uses an annular, diamond-impregnated bit mounted on the end of a rotating string of rods. Interestingly, these diamonds are not useful as jewellery but are used in the drill bits



for their hardness and the bit is suitable for the hardest rocks. The rod cuts a solid core which passes up inside the drill rods as the bit advances. The bit is lubricated with water and drilling fluid or water/mud mixture which is pumped to the cutting face down the inside of the rods. It then returns to the surface between the rods and the sides of the hole. At the surface, the return water is collected in a sump where fine suspended ground rock material can settle. n.

*Site Rehabilitation:* Dug out trenches will be back filled with waste rock (gangue). Stockpiled top soil will be returned to the backfilled areas. Sites will also be re-vegetated and returned to a pre-exploration state. Boreholes will be sealed and rehabilitation will be done concurrently with exploration (ore removal etc).

*Water requirements:* Water will be sourced from existing boreholes. About 80,000 litres (80 m<sup>3</sup>) per day would be required. This amount of water is aimed at suppressing dust around tipping areas and vehicle tracks. Approximately 200 *liters* of domestic water will be needed per day.

*Waste management:* Waste material generated will be in the form of rock material (non-mineral) and derived from trenching activities. Insignificant amounts of domestic waste will be generated by the exploration team. Domestic or general waste will be transported out of the EPL area on a daily basis and disposed at an approved land fill site. There are no licenced waste disposal sites in the project area.

*Sewage Management:* During exploration, sufficient portable chemical toilets will be provided for workers and appropriately emptied according to their manufacturer's operational standards and legislated occupational sanitary provisions. Licenced waste contractors will provide sewage removal services.

### **Exploration equipment, Materials and Services:**

Construction equipment will be sourced from contractors proximate to the project site. Were deemed essential, equipment will need to be sourced from elsewhere in the country and/or abroad as per the required and approved operating standards.

*Labour sourcing:* Temporary employment opportunities will be created during the duration of exploration activities.

**Housing:** Personnel will be accommodated at an identified exploration camp area. Before use of a camp, an environmental risk assessment will be conducted and submitted together with the biannual report of the exploration activities.

### **2.1.3. Decommissioning/Closure Phase**

This phase will involve the removal of equipment and dismantling of facilities and safe closure. All trenches will be backfilled. The surface affected by exploration will be rehabilitated and re-vegetated in accordance with applicable standards

#### **2.1.4. *Environmentally sensitive areas identified***

The proposed exploration activities are not in any sensitive protected areas such as community forests, conservancies, and areas with memorial sites. A Specialist Heritage and Archaeological impact Assessment was commissioned for the project area.

### 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
<b>Water</b>	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
<b>Power</b>	Electric drives and generators	Solar
<b>Power for cooking</b>	Gas stoves	Solar
<b>Worker’s accommodation</b>	Campsite at the project site	Accommodation in the nearest town, which is Arandis (depending on commuting and accessibility)
<b>Exploration Technology</b>	Bulk Sampling	Diamond Drilling Air core drilling
Waste Management		
<b>Sewage</b>	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)	
<b>Domestic waste</b>	Onsite waste bins, regularly emptied at the nearest landfill	Driving waste daily to the nearest town landfill
<b>Hazardous waste (chemicals)</b>	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

To ensure that the proposed development comply with the legal requirements for good practice and preservation of the environment, a review of applicable Namibian and international legislation, policies and guidelines have been consulted. This review serves to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEA of the requirements and expectations, as laid out in terms of these instruments.

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"> <li>-Occupational health and safety provisions during construction and operational phases should be clearly outlined.</li> <li>-Compliance monitoring and responsibilities for compliance monitoring should be clearly stated</li> </ul>
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.”	Compliance to the Public health act will be ensured in relation to the following: <ul style="list-style-type: none"> <li>- Sanitation facilities</li> <li>-Communicable diseases</li> <li>-Emergency healthcare provision</li> <li>- Covid workplace measures</li> </ul>
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.	
National Heritage Act 27 of 2004	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” 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.	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 be undertaken in a specific biophysical and social environment. The baseline conditions of these environmental features are described in the following subchapters. The baseline conditions are described for the subject area, which is the area/regions through which the project road traverses. EPL is located within the Arandis Constituency, Erongo Region.

### 5.2. Socio-economic profile

Based on the latest census results (Namibia Statistics Agency (NSA), 2012) the total population for Arandis is approximately 5 132 and for Arandis Constituency is 11 450. The population of Arandis has increased by approximately 38%, from 3 726 in 2001. The estimated size of the informal settlement in the Usab suburban area is 450 (KTC, 2010). The annual growth rate for the Erongo Region is estimated to be 3.4 % based on the population growth between 2001 and 2011. However, this figure 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 (approx. 43%). However, the annual growth rate for the Erongo Region is significantly higher than the national average (1.4%). The nearby farms within which the proposed exploration activities are proposed, inhabit a smaller population as compared to the townlands.

Some of the current economic activities taking place in the areas in and around Arandis include a mix of mining (large and small scale) and farming activities. In terms of mining the most significant activity is the Rossing Uranium. The percentage of the total of residents in Arandis of working age (15 years) and older that are unemployed is 30%, which is lower than the national percentage of 37% (NSA, 2012). However, unemployment is still a concern and this proposed mineral exploration might result in the establishment of a mine.

#### 5.2.1. Land Use

The Arandis Constituency is predominantly mining and tourism-based. The main land uses affected by EPL 8298 is state land.

### 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 through which the DR3633 passes through. 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).

## 5.4. The General Geology, Surface and Ground Water

### 5.4.1. Soils

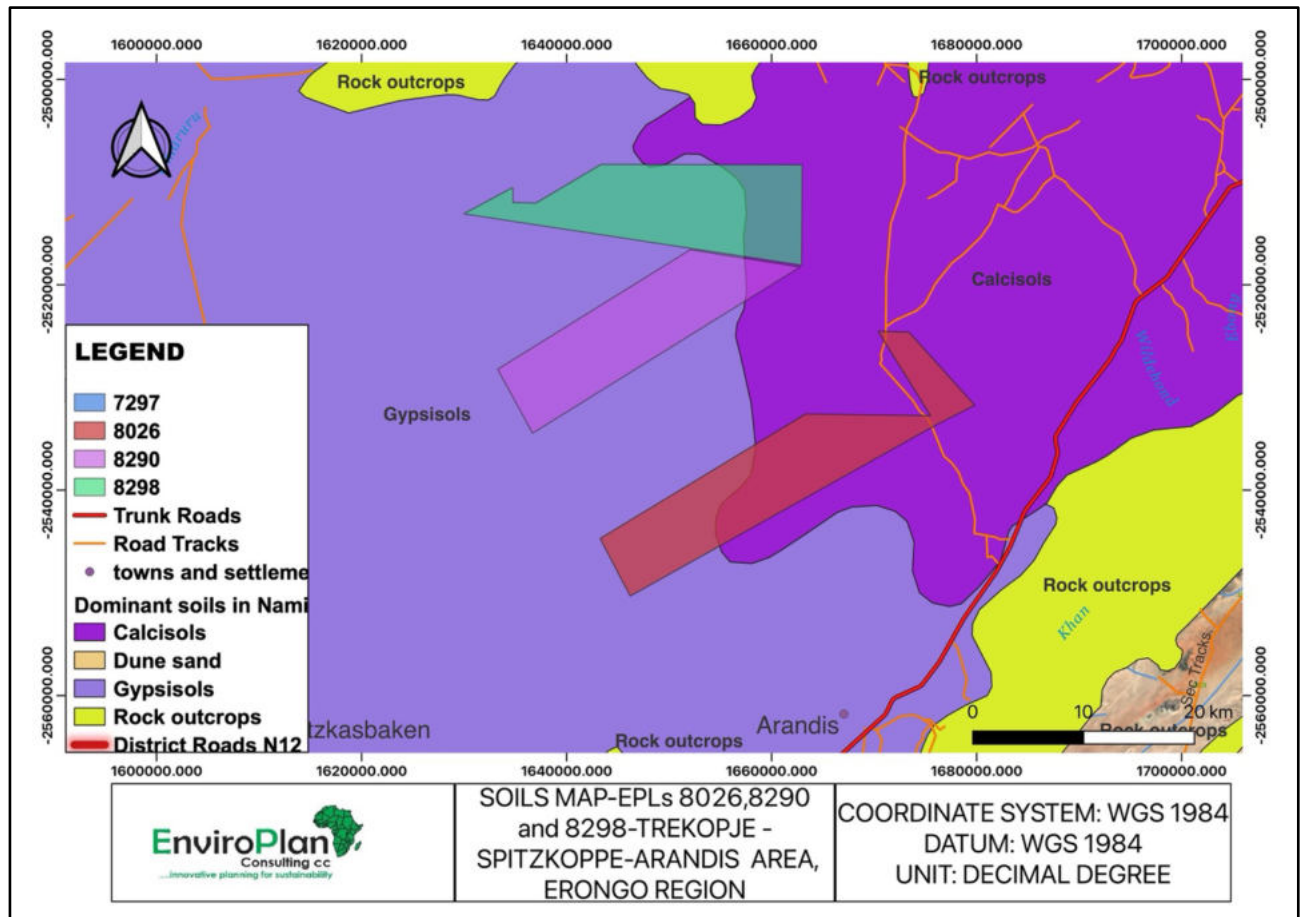
Three soil groupings were identified in the EPL area: Soils associated with the mountainous terrain, soils associated with the river systems (river channel and flood plain), and soils associated with the transition zone between the mountainous terrain and the river systems. Each of these groupings is described below:

#### **Mountainous/rocky outcrop soils**

This group of soils is shallow (less than 400mm in depth) with fine grained sandy and silty loams. The soils are all founded on hard rock and return poor vegetation cover. The associated soil forms include: calcisols and gypisols.

#### **River system/alluvial soils**

This group of soils is deep (from 800mm to greater than 1500mm) and the soils vary in texture from fine grained silt and sand to pebble size material. The soils are stratified alluvial sediments that are founded on an impermeable calcrete base that acts as a vertical drainage barrier which in turn retains moisture in the soil. This phenomenon is recognised as an important contributor to the ecosystem functionality in the river systems because the additional moisture in the soils is utilized by both fauna and flora.



**Table 6: Soils Map**

#### 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. Those are substantially preserved within the EPL, extensive over about a quarter of the EPL.
- 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.

#### 5.4.3. Hydrology (Surface Water)

The Khan, Wildhond and Epony ephemeral streams are in proximity to the project area, however these are over 20km from the EPL area. Small 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. During exploration, flood protection measures for the will be implemented.



**Table 7: Sandy riverbeds within the project area**

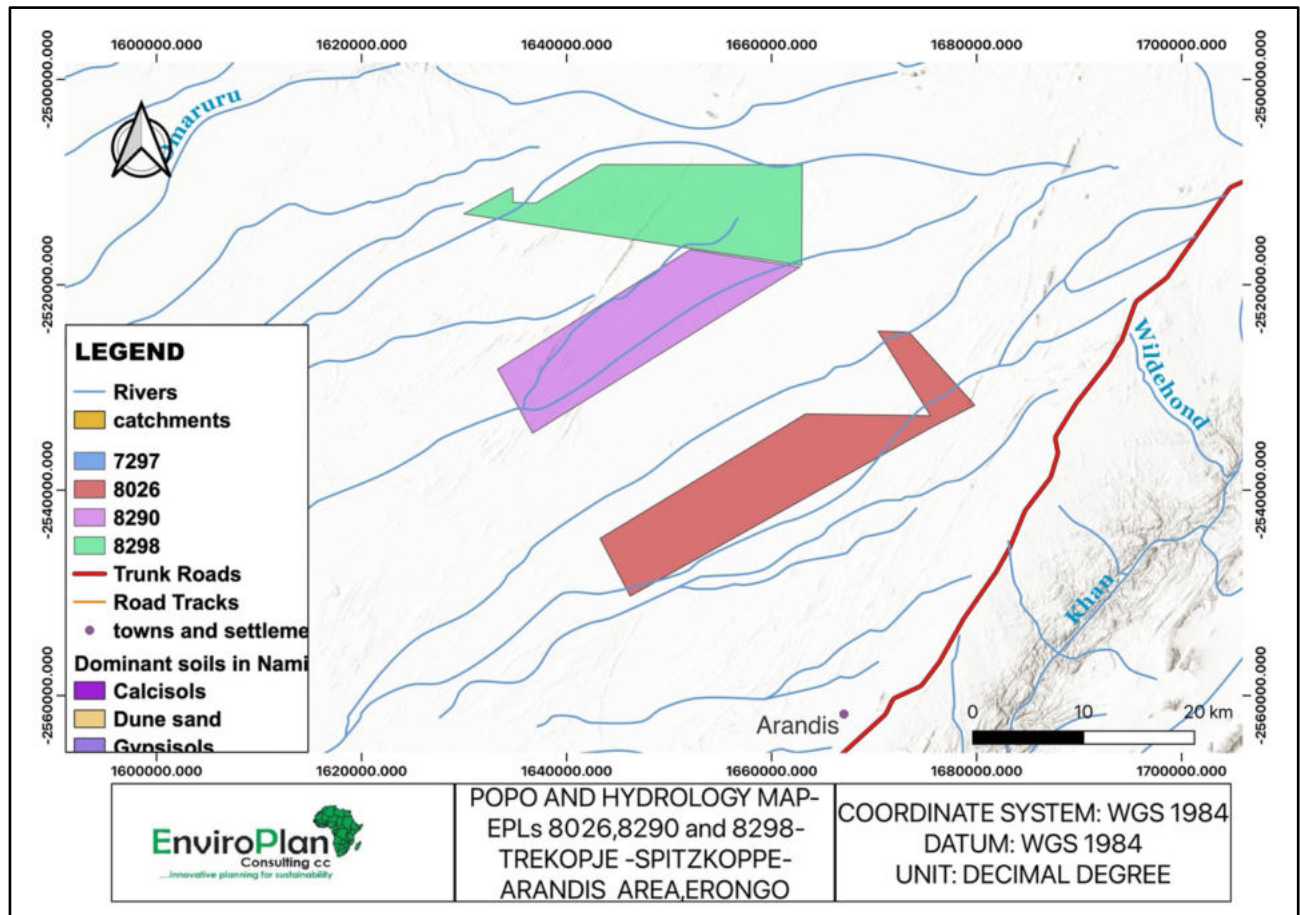


Figure 2: Topo and Hydrological Map for the project area

## 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 ramossisima, 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 (Khomas Hochland to the east of Arandis). The elevation within Arandis varies between 1150 and 1450 metres. The study area is mainly comprised of four habitat types namely:

- Marble ridges; and
- Ephemeral river channels;



**Figure 3: EPL 8298 Vegetation structure**

*The project area is characterized by vast grasslands and riverine vegetation structures composed of white thorn and some shrubs. There are existing structures in the EPL area such as powerlines, access tracks, previous mining tunnels and past exploration. The EPL is also in proximity to Klein Spitzkoppe with local settlements.*

The central desert biome was observed within EPL area, old and magnificent specimens of the welwitchia and some selected cactii (see images above) can be found. The other common plants on site are shrubs composed mainly of white thorn as illustrated above:

The EPL 8298 is situated towards the eastern edge of the Central Namib Desert vegetation zone. This zone extends southwards to the Kuiseb River, and to the east, known as the Escarpment Zone. Even though the Central Namib Desert is considered to be a distinct vegetation zone, there is a distinctive east-west distribution pattern within this zone. This pattern is closely related to the inland distribution of coastal fog. The fog can reach as far as the Rössing Mine. However, all of the plant species found within this region are considered to be drought-tolerant, drought-resistant or succulents.

The relevant plant species are often widely dispersed. The predominant species are primarily *Zygophyllum stapffi* and *Arthroa leubnitziae*, along with a few *Hypertelis caespitosa*. Lichens are fairly common on the large gravel and gypsum plains.

Some of the lichen species include *Parmelia* spp., *Telochistes capensis* and *Usnea* spp. The lichens attach themselves to small fragments of stone or gypsum flakes, with *Arthroa leubnitziae* forming thick stands in shallow depressions or on slopes of low ridges. These lichen, microfungi, green algae, and cyanobacteria surfaces are also referred to as biological soil crusts, and are important features of the desert environment. These are thin layers on the surface to a few millimetres into the ground or even under translucent stones.

These crusts are important features in the barren landscape, as it stabilises soil surfaces, and thus protect these surfaces from erosion. In addition, it contributes towards seed germination and nitrogen and carbon fixing, and acts as good biological indicators of the condition of the surrounding environment.

On site frequency of lichen was insignificant, and was mostly limited to watercourses and rocky hillsides. This is essentially due to the dust produced as a result of the mining activities.

The vegetation further inland, within water courses or river beds is distinctively denser than on the plains. Species such as *Asclepias buchenaviana* is fairly common, with *Acacia reficiens* becoming more prominent closer to the coast. Many annuals sprout following some rainfall, with the more common species being of the *Stipagrostis* species. Grassy plains can be found between the desert and the escarpment.

The western portion of the Escarpment Zone is characterised by species with succulent stems or leaves, whereas further east shrubs and half-shrub species are common and eventually woody species are found. Woody species are also common within the drainage lines. The episodic rivers drain from the interior plateau down towards the coast, resulting in deep channels. This has allowed for species characteristic of the escarpment to colonise areas within the Central Namib Desert which otherwise would not be feasible. Some of the species found within or along the river beds include the following woody species: *Acacia erioloba*, *A. albida*, *Tamarix usneoides*, *Euclea pseudebenus*, *Ziziphus mucronata*, *Salvadora persica* and *Prosopis glandulosa*.

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.

### 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 Hillides: 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 8: List of reptiles likely to occur in the project area**

Scientific name	Common name	Occurrence (✓)	Conservation Status
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<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 semivariiegatus</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	✓	-
<b>Lizards</b>			

<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>Cordylus subtesellatus</i>	Dwarf plated Lizard	✓	-
<b>Skinks (Scincidae)</b>			
<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	✓	-
<b>Monitors (Varanidae)</b>			
<i>Varanus albigularis</i>	Rock or White-throated monitor	✓	-
<b>Agamas (Agamidae)</b>			
<i>Agama anchietae</i>	Anchietae Agama	✓	-
<i>Agama planiceps</i>	Namibian Rock Agama	✓	Endemic
<b>Chameleons (Chamaeleonidae)</b>			
<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	✓	-
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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 9: 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	-



Scientific name	Common name	Status in Namibia
<i>Urocolius indicus</i>	Red-faced Mousebird	-
<i>Cypsiurus parvus</i>	African Palm Swift	-
<i>Tachymarpis melba</i>	Alpine Swift	-
<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 albicularis</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.

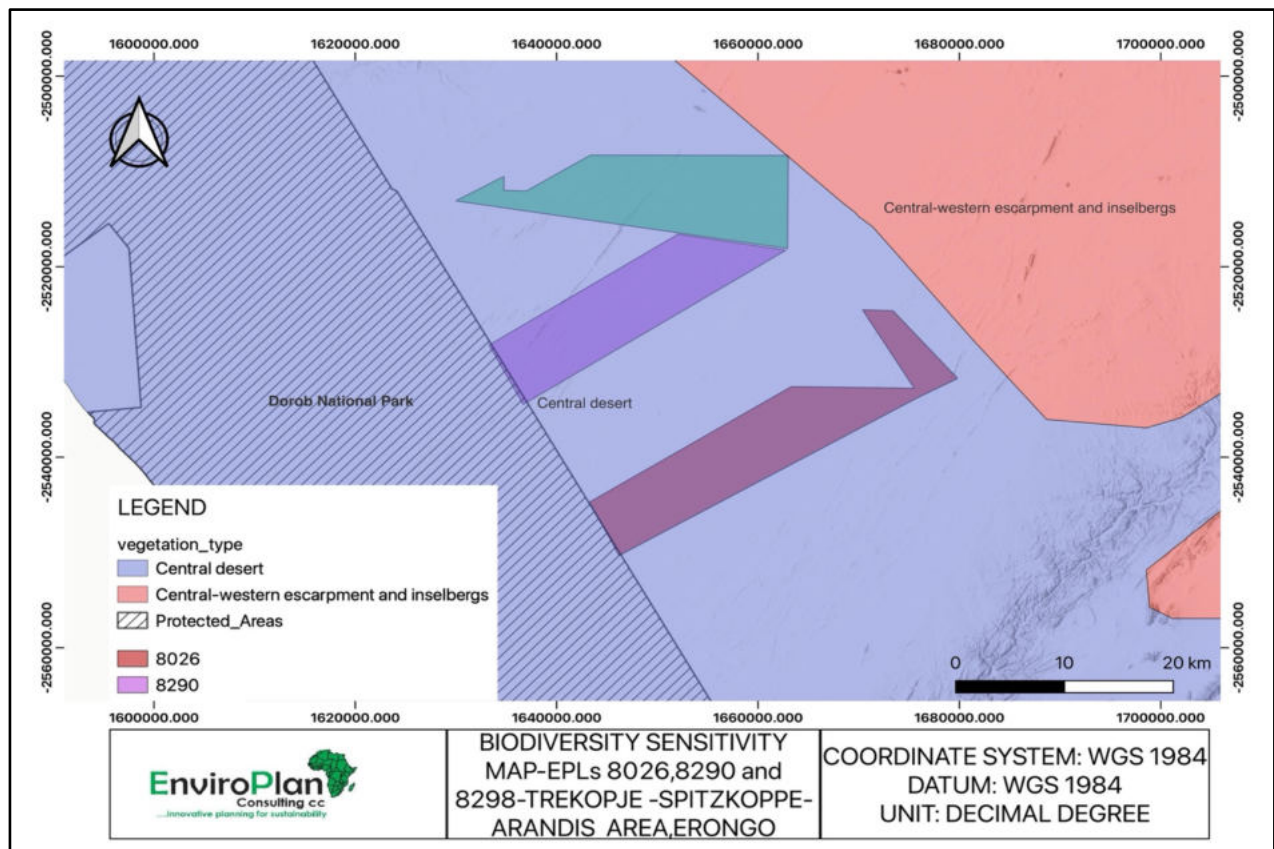


Figure 4: Vegetation Cover Map

### 5.6. Culture and Heritage (HAIA in Annexure C)

The site surveys undertaken only observed some building within Arandis town that can be somehow categorized of having historical values, taking example of the church building, the architectural design of it gives a characteristic of the town itself, the Arandis town hall is also of some historical value with regard to the establishment of the town itself in the late 1970’s. There were no structures which are of historical significance within EPL 8115. On further investigation, only the sites which are deemed to be of national historic significance are situated in Swakopmund, Usakos and Karibib, of which their presence are reported in this report, and therefore the impact is expected to be **LOW**.

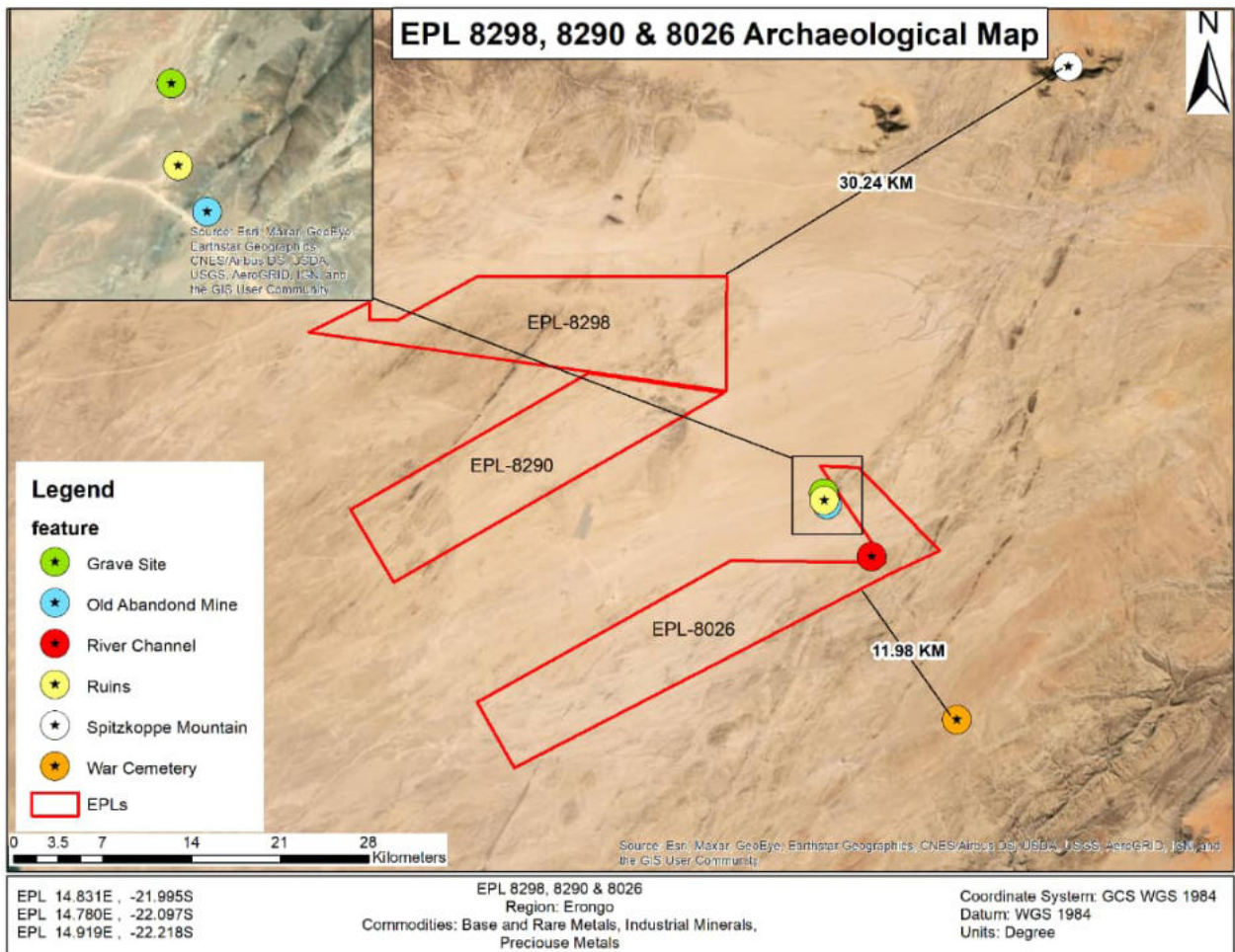


Figure 5: Culture and Heritage Sensitivity

## 6. CHAPTER SIX: PUBLIC CONSULTATION

### 6.1. Overview

Public and Stakeholder involvement is a key component of the EA process. The public consultation process, as set out in Section 21 of Regulation No 30 of EMA, has been followed during this assessment and the details thereof are documented below.

Public consultation forms an important component of an Environmental Assessment (EA) process. Public consultation provides potential Interested and Affected Parties (I&APs) with an opportunity to comment on and raise any issues relevant to the project for consideration as part of the assessment process. Public consultation has been done in accordance with both the EMA and its EIA Regulations.

The public consultation process assists the Environmental Assessment Practitioner (EAP) in identifying all potential impacts and the extent to which further investigations are required. Public consultation can also aid in the process of identifying possible 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.

A summary of the I&APs identified is presented in Table 10. The complete list of I&APs is provided in Appendix B.

**Table 10: Summary of Identified IAPs**

<b>List of IAPs</b>	<b>Description</b>
	Ministry of Environment and Tourism
	Erongo Regional Council
	Arandis Constituency
	Local community members

**6.2.2. Communication with I&APs**

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

Meetings were held with the relevant authorities as follows (see Appendix B):

**Table 11: Consultative engagement conducted**

<b>Date and Time</b>	<b>Activity</b>	<b>Venue/Place</b>
21.04.22, 11:40 – 13:30	Consultative Meeting	Klein Spitzkoppe Meeting Tree

- 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 Arandis, Klein Spitzkoppe and Project area (see Appendix B); 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 May 28 2022. The comment period will remain open until the final scoping report is submitted to MET.

**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 B 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 B).

**Table 12: Newspaper & Site Notices (Appendix B)**

Newspaper	Area of Distribution	Language	Date placed
Windhoek Observer (Refer to Appendix B)	Country Wide	English	18-31 March 2022
Confidante (Refer to Appendix B)	Country Wide	English	25 March - 31 March 2022
Site notice	Arandis, Klein Spitzkoppe, EPL Area	English,	18 March - 24 March 2022
Public Meeting Meeting minutes attached in Appendix B	Klein Spitzkoppe	English	21.04.2022

### 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 B and C.



**Figure 6: Public Consultation Notification Poster**

### 6.3.4. Stakeholder Meetings & Key Conversations

Public consultation meetings were conducted, and these were represented with traditional authority, council representatives, regional council, residents, government and quasi-government departments and ministries. Meeting minutes were taken attached in Appendix B and pertinent issues relating to the projects were discussed and recorded. Below are meeting proceedings pictures taken.



**Figure 7: Public Meeting Proceedings at Klein Spitzkoppe**

### 6.3.5. 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.

Attendance registers, comments and proof of stakeholder's engagement are attached in appendix B of this ESR. Key Issues raised during the consultative meeting are presented below:

## 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 proposed activities have impacts on certain biophysical and social features. The identified impacts were assessed in terms of probability (likelihood of occurring), scale/extent (spatial scale), magnitude (severity) and duration (temporal scale) as presented in Table 14, 15, 16 and 17 8. To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable.

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

- Provision of a brief explanation of the impact;
- Assessment of the pre- 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)
<b>Qualitative</b>	Very high deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species	Substantial deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes	Moderate deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration	Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers	Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.

### 7.1.4. Probability of occurrence

Probability describes the likelihood of the impacts 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**

<b>Low (1)</b>	<b>Low/Medium (2)</b>	<b>Medium (3)</b>	<b>Medium/High (4)</b>	<b>High (5)</b>
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**

<b>SIGNIFICANCE</b>	<b>ENVIRONMENTAL SIGNIFICANCE POINTS</b>	<b>COLOUR CODE</b>
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 is mostly concerned with the preparation of the site for access roads, drilling sites and camping sites. The potential impacts during this phase include loss of biodiversity, dust and noise during site clearing and preparation.

## 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

### 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
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**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 (NHCN) 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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# APPENDICES

