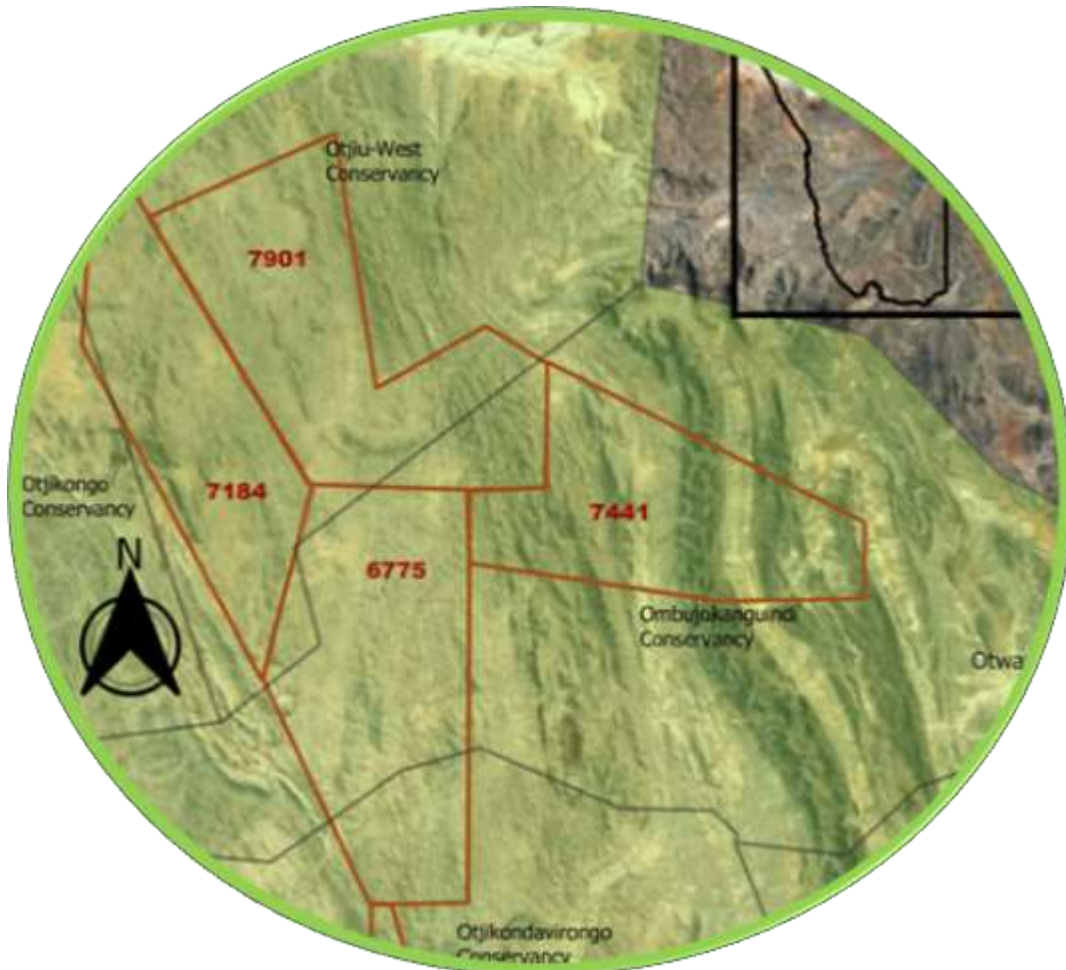


ENVIRONMENTAL IMPACT ASSESSMENT

FOR PROPOSED EXPLORATION ACTIVITIES ON EPL 7901,7184,7441,6775 &
5982 NEAR OTWANI, OPUWO AREA
KUNENE REGION.



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DOCUMENT AUTHENTICATION

This Environmental Impact Assessment project report has been prepared by Eco-Wise Environmental Consulting cc in accordance with the Environmental Management Act No 7 of 2007 (EMA) and its regulations of 2012, which requires that every mining related project must have an EIA report prepared for submission to the Ministry of Environment and Tourism-Division of Environmental Affairs. We the undersigned, certify that the particulars in this report are correct and righteous to the best of our knowledge.

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ENVIRONMENTAL AUTHORIZATION INFORMATION

Please note that the environmental clearance certificate should be issued out to the client. All comments and enquiries during the evaluation of this document must be addressed to the Environmental Consultants. Please forward the clearance certificate to the consultant.

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ACRONYM

ACRONYM	MEANING
BID	Background Information Document
EIA	Environmental Impact Assessment
EAP	Environmental Assessment Practitioner
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
I&APs	Interested and Affected Parties
LTD	Limited Company
PPP	Public Participation Process
PTY	Proprietary
ToR	Terms of Reference

1. INTRODUCTION

Kaoko Mining Namibia (Pty) Ltd (The Proponent) proposes to conduct exploration activities on Exclusive Prospecting Licenses 7901,7184,7441,6775 and 5982 near Otwani, Opuwo area in Kunene Region. The EPLs are projected to host commodities such as base and rare metals, dimension stone, industrial minerals and precious metals. However, the proponent interest is mainly in copper deposits.

The listed EPLs' belong to different local individuals who came together and formed a company and then transferred their EPLs into that company which is Kaoko Mining Namibia (Pty) Ltd. **See Appendix B**, Agreement for transfer of the EPLs from the shareholders to Kaoko Mining Namibia (Pty) Ltd. All the EPLs listed were checked on the Ministry of Mines and Energy portal and were found not to be falling under environmental sensitive areas or withdrawn areas.

Eco-Wise Environmental Consulting being an independent consultant was therefore hired to conduct an EIA for the proposed exploration activity. Eco-Wise Environmental Consulting cc conducted a site visit on 29/10/2019. The consultant was mainly guided by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (2012) during the process of the EIA. The Environmental Impact Assessment Regulations (2012) states all the activities, which require an Environmental Impact Assessment and among the listed activities is annexure 3, mining and quarrying activities where this project is classified under. Annexure 3.2 states that other forms of mining or extraction of any natural resources whether regulated by law or not and 3.3 Resource extraction, manipulation, conservation and related activities require an EIA. The competent authority will be, Ministry of Environment and Tourism. Images below show information of the EPLs according to the Namibia's Mining Cadastral Portal (<http://portals.flexicadastre.com/Namibia/>, 2020).



Figure 1: EPL 7441,7901,5982 & 6775 on Namibia's Mining Cadastral Portal (<http://portals.flexicadastre.com/Namibia/>, 2020)

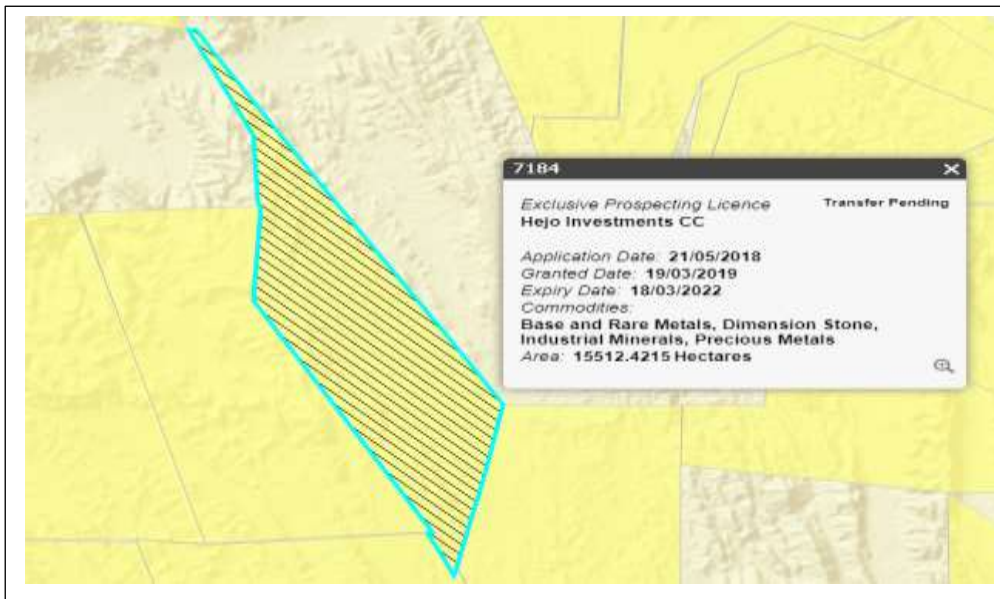


Figure 2: EPL 7184 on Namibia's Mining Cadastral Portal (<http://portals.flexicadastre.com/Namibia/>, 2020)

1.1 The Need for an Environmental Assessment (EA)

The consultant was mainly guided by the Environmental Management Act (No. 7 of 2007) and Environmental Impact Assessment Regulations (2012) during the process of the EIA. The EIA regulations (2012) states all the activities, which require an EIA and among the listed activities is annexure 3, mining and quarrying activities where this project is classified under. Annexure 3.2 states that other forms of mining or extraction of any natural resources whether regulated by law or not and 3.3 Resource extraction, manipulation, conservation and related activities require and EIA.

Ecowise Environmental Consulting cc was therefore appointed by Kaoko Mining Namibia Pty Ltd to fulfil the requirements of the Environmental Management Act and its 2012 Environmental Impact Assessment Regulations.

1.2 Need and Desirability of the Project

Namibia's Vision 2030, National Development Plan 4 (NDP4) and Harambee Prosperity Plan (HPP) both recognize a need for, and place value on, economic growth and employment creation. The following factors justifies the need for the project:

- **Boosting Namibia's copper supplies and mineral export** - previous geological researches show possibilities of copper deposits and also minerals like semi-precious stones and precious metals. If minable deposits of copper are found, Kaoko Mining Namibia Pty Ltd intends to supply to Tsumeb Smelter and maybe export the remaining hence boosting Namibia's copper supplies and at the same time it will help Namibia's economy through foreign currency earned from exports.
- **Empowerment of locals**- Kaoko Mining Namibia (Pty) Ltd has thirty-three local shareholders, hence if the project is successful it will result in empowering these local shareholders. The company has created a collective agreement amongst all stakeholders to govern this opportunity with the ultimate goal to create value and empower Namibians.

- Economic development**- if medium to large minable copper deposits are explored, this will boost Namibia's economy through exports. The proponent will also generate revenue for the government through taxes and revenue generated is channelled to the country's development.
- Employment creation** - during the exploration phase, mainly professionals with the expertise will be hired to explore the area. Casual labor might however be sourced from locals when the need arises.
- Community development**- generally, the area of Opuwo rural is remote hence this project will have a potential to boost the development of the area. If a mine is established in future, this might likely lead to upgrading of roads, establishment of infrastructure, increase of people which will have a consequence of increasing demand hence promoting local sells and products.

1.3 Terms of Reference

The approach to undertake the work was guided by the following ToR, which were provided by the proponent;

- Conduct environmental scoping.
- Determine all the possible environmental and socio-economic impacts of the project.
- Conduct public participation process to gather the views of Interested and Affected Parties.
- Design an Environmental Management Plan with sound and relevant mitigation measures for monitoring purposes.
- Compile a full EIA report for submission to Ministry of Environment and Tourism and Ministry of Mines and Energy.
- Coordinate the whole application process of the Environmental Clearance Certificate until the issuance of the certificate.

1.4 Objectives

The objectives of the study were derived from the ToR and they are as follows:

1.4.1 General objective

- To determine the potential environmental and socio-economic impacts derived from the exploration activities

1.4.2 Specific Objectives

- To establish baseline environmental conditions so that relevant impacts could be projected and sufficient mitigation measures could be designed
- To identify direct or indirect environmental impacts that may result from the proposed activity.
- To consult with key, interested and affected stakeholders so that their concerns are considered in the formulation and implementation of the Environment Management Plan.
- Comply with Namibia's Environmental Impact Assessment Regulations (2012), Environmental Management Act (No. 7 of 2007) and other relevant laws and regulations.
- To propose alternative measures where it is noticed that adverse effects may occur.
- To set up an Environmental Management Plan that will govern all activities of the project for the better protection of the environment.

1.5 Methodology used for the study

Desktop Study- this involved review of documents and relevant legislation. Documents containing geological, vegetation, climatic, demographic and hydrological data for Namibia were also reviewed.

Site Visits –the EIA team visited the sites on 29/10/2019. The field visit was meant for physical inspections of the sites in order to gather information on the state of the environment.

Public Participation-the study also sought public opinion/views through distribution of questionnaires and public meetings. The meetings were held on 02/11 2019 at Otwani Rural District Council at 10:00am, Sesfontein Conservancy at 14:00 and Otjapitjapi village at 17:00.

Mapping-more data was obtained from the maps which were produced by the consultant GIS personal. The maps included vegetation, hydrogeology and location.

Reporting- all data gathered was used to compile an EIA and EMP report which was submitted to Ministry of Environment and Tourism and Ministry of Mines and Energy.

1.6 Land ownership

The land is under communal land, see Appendix B consent letters from the traditional authorities. The shareholders were however allocated the EPLs by Ministry of Mine and Energy.

1.7 Scope of work

The scope of the study includes carrying out environmental investigations in line with current provisions on environmental legislations. The Environmental Management Act (No 7 of 2007) and its regulations of 2012 were used as guidelines for the EIA study. The report is aimed at identifying and evaluating environmental and socio-economic impacts associated with the project. This report provides the following sections:

Description	Section of the Report
Project description	Chapter 2
Alternatives considered for the proposed project in terms of no- go option, location and exploration methods	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
Public consultation process	Chapter 6
The identification of potential impacts, impacts description, assessment, mitigation measures and recommendations	Chapter 7
Recommendations and Conclusions	Chapter 8

2. PROJECT DESCRIPTION

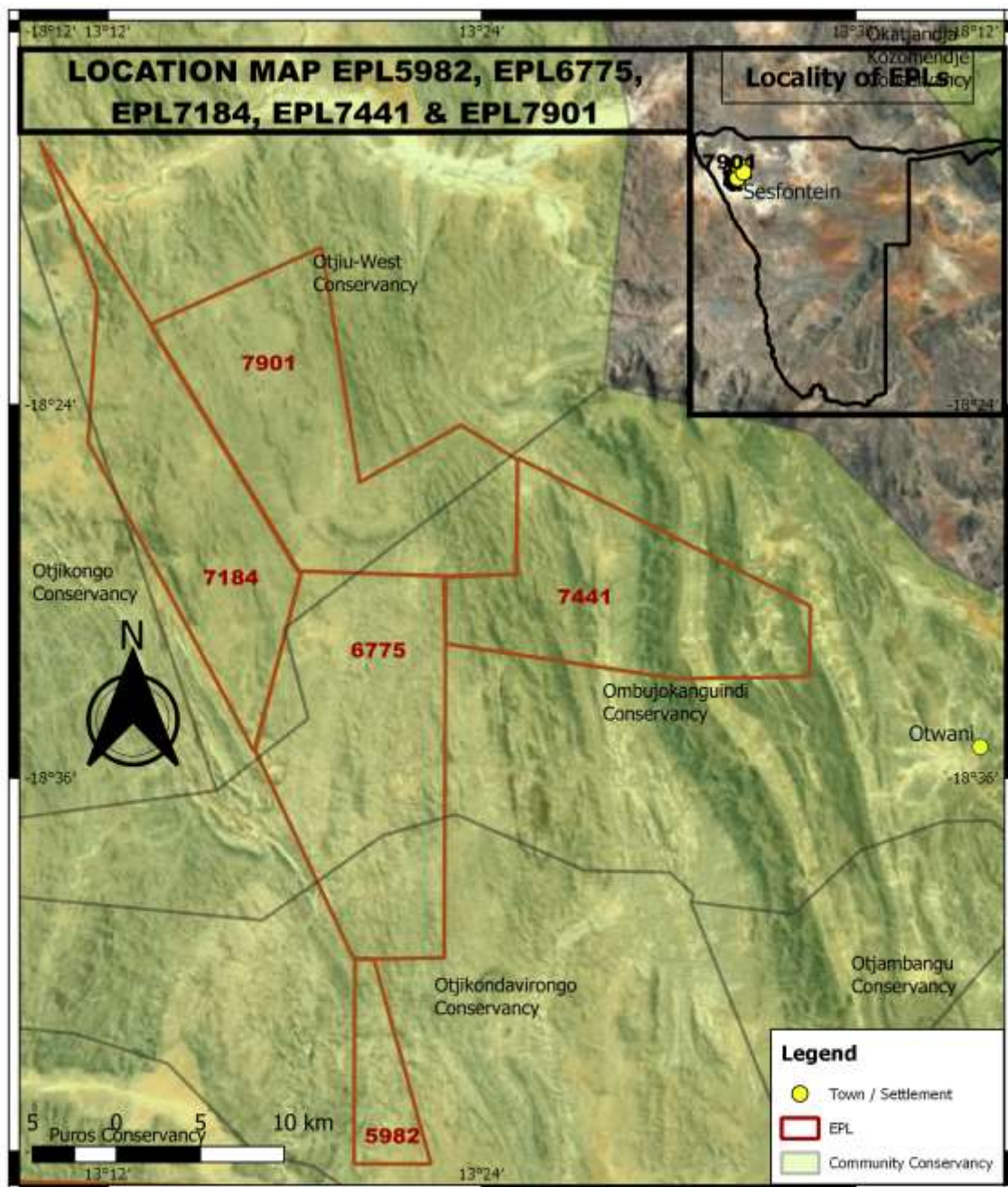
The proposed activity on the following EPL 7901, 7184, 7441, 6775 and 5982 will entail exploration activities mainly for copper deposits.

2.1 Site Location and Jurisdiction

The EPLs share boundaries as shown in figure 2.1, location map below. The EPLs are located near Otwani, Opuwo area in Kunene Region. The regional administration is Kunene Regional Council and the constituency is Opuwo. The coordinates and area of the EPLs are shown on the table below.

Table 2. 1: Coordinates for the EPLs

EXCLUSIVE PROSPECTING LICENCE(EPL)	AREA (HECTARES)	CONSERVANCY	COORDINATES			
			Corner 1	Corner 2	Corner 3	Corner 4
6775	19931.676	Ombujokanguindi Otjikondavirongo	18°29'46"S 13°18'12"E	18°29'46"S 13°22'34"E	18°42'02"S 13°22'39"E	18°42'02"S 13°19'36"E
7184	15512.4215	Otjiu-West	18°16'02"S 13°09'44"E	18°29'34"S 13°17'54"E	18°35'44"S 13°16'40"E	18°25'44"S 13°36'18"E
7901	19952.7336	Otjiu-West	18°21'44"S 13°13'20"E	18°19'42"S 13°18'39"E	18°29'38"S 13°24'57"E	18°29'33"S 13°17'59"E
5982	3182.9318	Otjikondavirongo	18°42'14"S 13°19'44"E	18°42'17"S 13°20'09"E	18°48'36"S 13°22'17"E	18°48'36"S 13°19'51"E
7441	14792.1825	Ombujokanguindi	18°31'55"S 13°22'41"E	18°26'06"S 13°25'07"E	18°30'55"S 13°34'21"E	18°33'08"S 13°34'26"E



CONSULTANT	CLIENT
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Figure 2.1: Location Map

2.2 Description of Activity

Exploration is a stage of investigating or examining about the geological condition of an area. The main aim at this stage is to find high quality ore. It is vital to note that, no construction will take place during the phase of exploration. In addition, existing roads will be used hence reducing the impact of clearing vegetation. Roads in bad conditions will be upgraded and where EPLs are inaccessible, cut lines will be created for accessibility of vehicles. The prospectors will be accommodated at nearby villages. Other employees for manual labor will be sourced from nearby villages hence commuting to work from their homes. The following activities will be conducted during the process of exploration:

Research and reconnaissance- research shall firstly be done whereby survey of existing literature, examination of aerial photographs and satellite imagery alongside acquisition of geophysical data and geological maps of the prospective region will be reviewed. The desktop information is used to generate a geological model on which all the future exploration activities will be based.

Reconnaissance will be done whereby Mr David an employee of Kaoko Mining Namibia Pty Ltd will walk around the mining claims so as to try and identify areas with ore deposits. In a case that Mr David identifies a potential area, Mr Arno (geologist) will further verify. During this stage, prospectors will only look in the rocks thus for useful minerals and other clues to where a deposit may be hidden. The main purpose of carrying a reconnaissance is to reduce the areas of study by identifying select ones for further studies.

Trenching and Drilling –Kaoko Mining Namibia Pty Ltd intends to use limited trenching and drilling. Trenching will be used to expose the ore body near the surface and shovels and picks will only be used. This is a cost-effective method compared to drilling. Drilling will be used to have a better understanding of the subsurface geology. In a case that the ore deposits extend underneath, drilling will be used. Exploratory openings or boreholes will be drilled at closer intervals along the strike and also depth wise, to accurately determine the shape, size, disposition of ore and grade of ore body.

Geochemical sampling and analysis- samples will be collected during trenching and drilling and sent for chemical analysis/testing.

Mapping- a map will be produced showing areas with potential deposits. Such maps will be of great importance during the mining phase.

Resources Required

The list of anticipated resources required during exploration include:

- Drilling rig equipment, including support truck(s);
- 4x4 vehicle(s);
- Compressor and generator(s);
- Fuel to power the drill rigs.
- Picks and shovels during trenching
- Personnel (drilling contractor, personnel for trenching, geologist and assistant, project manager & safety health and environmental officer)

2.2.1 Power and Water Supply

It is anticipated that power supply required for drilling will be supplied by generators. Water required for drilling works will be sourced from nearby villages. If there will be no sufficient water supply in the project area, water for drilling will need to be trucked from elsewhere, outside the exploration site.

2.2.2 Site Access

Access to EPL 7901, 7184, 6775, 7441 & 5982 can be obtained via the C43 road connecting Otwani and Sesfontein. From the C43 road, the EPLs are further accessed via gravel road. Site image1 below shows the Opuwo to Sesfontein road which links to the sites.



Site image 1: C43 access road

3. 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 focus on the alternatives to the project which will be most practical but least damaging to the environment. The following alternatives will be considered:

3.1 No-Go Option

The “No-Go” alternative is the option of not proceeding with the activity, which typically implies a continuation of the status quo. Should the proposed works on the EPLs be discontinued, none of the potential impacts (positive and negative) identified would occur. Furthermore, the EPLs will remain unused, i.e. the potential mineral ores occurring within the EPLs will remain unexplored. This would also mean that the potential employment creation from exploration works and eventually mining will not occur. Hence, no economic contribution will come from the EPLs. The ‘no-go’ option will therefore not be the preferred alternative.

3.2 Alternative Location

Alternative locations, implies that a different location to carry out the development must be acquired somewhere else other than the chosen site. Nevertheless, the fact that there are possibilities of copper deposit basing on past researches justify the use of the proposed sites for further studies. It is also impossible to find an alternative location for the project because the presence of mineral ores to be explored is area specific, which is primarily determined by the site geology. Exploration activities will therefore be needed so as to explore the area first to see if the area has minerals. Alternative location will only work in future when the Proponent needs to conduct mining activities thus when they can choose alternative sites rich in ore deposits.

3.3 Other Alternatives

Other alternatives to be considered include alternative methods and services infrastructure.

3.3.1 Exploration methods

Both limited trenching and drilling shall be used during exploration phase. Limited trenching will be used to understand the surface geology whilst drilling will be used for subsurface geology.

3.3.2 Services Infrastructure

During the project services will be required hence the need to look on the alternatives at hand. Table 3.1 shows alternatives considered in terms of services infrastructure.

Table 3.1: Alternatives considered in terms of services infrastructure

Services	Proposed source	Alternative source
Water	Local water sources from the nearby villages will be used.	Piping water from other sources out of the project area so as to supplement local water supplies.
Power for drilling	Diesel generators	Solar
Power for cooking	Gas stoves	Fire wood
Workers accommodation	Campsite on the nearby villages for geologist, assistant and drilling crew Other employees for manual labor will be sourced from the nearest village.	Accommodation can be sourced from the nearest town which is Opw o
Road (site accessibility)	EPLs to be accessed from C43 road from Opw o	
Waste Management		
Sewage	Portable toilet to be used and these are advantageous because they are easy to transport and environmentally friendly (if properly disposed)	Ventilated improved pit (VIP) latrine.

3.4 Conclusions on the Considered Alternatives

The preferred option will be to continue with the project which means that the no-go alternative will not be considered. The alternative location will be determined by potential ore deposits in an area hence making it difficult if possible, to determine the location before any exploration is done.

Furthermore, water for the proposed activity will be sourced from nearby villages. In cases that the water sources from the villages have low yields, water will be transported by trucks from other villages around the area. Apart from that, power for drilling will come from a diesel-powered generator. The route which comes from C43 will be used and no alternative route for access will be available. Portable toilets shall be used at the village and site where the contractor crew, geologist and assistant will be staying and working respectively. Portable toilets are easily transportable and environmentally friendly (if properly disposed).

4. LEGAL FRAMEWORK

This section looks at the legislative framework within which the proposed development will operate under. The focus is on the compliance with the legislation during the exploration process. The proponent is therefore required to abide with these legislations. Table 4.1 below shows relevant legislation to the project.

Table 4.1: Relevant legislation to the project

Aspect	Legislation	Relevant Provisions	Relevance to the Project
The Constitution	Namibian Constitution First Amendment Act 34 of 1998	<ul style="list-style-type: none"> - According to article 91(c) it provides for duty to guard against “the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia” - Article 95 (l) deals with the “maintenance of ecosystems, essential ecological processes and biological diversity” and sustainable use of the country’s natural resources. 	<ul style="list-style-type: none"> - During exploration activities, sustainable practices should be performed.
Environmental	Environmental Management Act 7 of 2007	<ul style="list-style-type: none"> - States that, projects with significant environmental impacts are subject to an environmental assessment process (Section 27). - Requires for adequate public participation during the environmental assessment process for interested and affected parties to voice their opinions on a project (Section 2). 	<ul style="list-style-type: none"> - The EMA should guide the management of this project. - Adverts should be published in two local newspapers twice. - The public and relevant authorities should be consulted during the process of public participation as per the requirement of the act - The EMP which will guide on the management of the environment should be drafted as per the requirement of the act
	EIA Regulations (2012)	<ul style="list-style-type: none"> - Lists all activities, which cannot be undertaken without an EIA. 	<ul style="list-style-type: none"> - This project is listed under mining and quarrying activities. - Activity 3.3 states that resource extraction, manipulation, conservation and related activities require an EIA.

	Convention on Biological Diversity (1992)	- Article 1 lists the conservation of biological diversity amongst the objectives of the convention.	- The proponent should consider the impact of the project on the biodiversity of the area.
	Nature Conservation Ordinance No. 4 of 1975	Chapter 6 provides for legislation regarding the protection of indigenous plants	- Indigenous and protected plants should be protected within the areas of works.
	Minerals (Prospecting and Mining) Act, 1992 (Act 33 of 1992)	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto. 'mineral' means any substance, whether in solid, liquid or gaseous form, occurring naturally in, on or under any land and having been formed by, or subjected to, a geological process, excluding-(c) subject to the provision of subsection (2), soil, sand, clay, gravel or stone (other than rock material specified in Part 2 of schedule 1).	- The intended activity involves exploration of minerals mainly copper ore.
Soil	Soil Conservation Act 6 of 1969	This act covers the prevention and combating of soil erosion; the conservation, improvement and manner of use of the soil and vegetation; and the protection of water sources	- Limited trenching will leave earthed soils hence it should not be left un-rehabilitated.
Water	Water Act 54 of 1956	- Prohibits the pollution of underground and surface water bodies.	- If drilling activities go below the level of the water table, they might be possibilities of pollution. Hence the pollution of water resources should be avoided during the exploration process.

Health and Safety	Labour Act (No 11 of 2007)	<ul style="list-style-type: none"> - This act emphasizes and regulates basic terms and conditions of employment, it guarantees prospective health, safety and welfare of employees and protects employees from unfair labour practices. 	<ul style="list-style-type: none"> - The proponent will be obliged to create a safe working environment for the employees.
	Public Health and Environmental Act, 2015	<ul style="list-style-type: none"> - The act mainly emphasis on proper management of the environment, to prevent negative health impacts. - The act promotes proper waste management. 	<ul style="list-style-type: none"> - Proper waste management should be promoted to prevent nuisance, which can consequently affect public health. - Recycling, reuse and reduce must be practised at all times thus if any waste is generated.
	Heritage Act	<ul style="list-style-type: none"> - The Heritage Act of 2004 makes provision for the developer to identify and assess any archaeological and historical sites of significance. The existence of any such sites should be reported to the Monuments Council as soon as possible. The Council may serve notice that prohibits any activities as prescribed within a specified distance of an identified heritage/archaeology site. 	<ul style="list-style-type: none"> - In an event that the Proponent comes across any archaeological or historical sites of significance, they should report immediately to the Monuments Council

N.B: The Proponent shall be required to comply with the legislations. Where there is need to engage private consultants to facilitate compliance, the Proponent is encouraged to consult qualified and certified personnel. The Environmental consultant is supposed to conduct legal compliance audits and produce bi-annual reports, which will be required during renewal of the environmental clearance certificate. The Proponent shall also be required to renew the permit from National Heritage Council .

5 ENVIRONMENTAL BASELINE

The proposed exploration activities will be undertaken in an environment with specific conditions. This chapter will therefore describe the environmental setting of the project, which includes the biophysical, environment and the socio-economic environment. The environmental baseline for the project area is presented below.

5.1 Biophysical Environment

5.1.1 Climate

The climate of the study area can be described as semi-arid with characteristic of low rainfall, high evaporation and high day time temperatures. Average annual rainfall in the area is between 300-350mm per year. Annual temperatures range between 20-22 °C with maximum temperatures ranging between 34-36 °C and the average minimum temperatures between 6-8 °C (Mendelsohn, Jarvis, Roberts, & Robertson, 2002). In recent years, the area under study has been affected by drought which greatly affected small livestock which the locals rely on. Table 5.1 shows the climatic data of the study area.

Table 5.1: General Climate Data

Average Annual rainfall:	Average rainfall in the area is between 300-350mm per year
Variation in rainfall:	Variation in annual rainfall is averaged to be 40-50 % per year
Average evaporation:	Average evaporation in the area is between 2240-2380mm per year.
Precipitation:	January-March receives high rainfall, with January being the wettest. June and July being the driest month
Water Deficit:	Average water deficit in the area is between 1700-1900mm per year.
Temperatures	Annual temperatures are 20-22 °C per year Average maximum temperature 34°C-36°C Hottest month February Average minimum temperatures 6°C-8°C Coldest month July
Wind direction	Wind directions in the area are predominantly from the south.
Humidity	Most humid month is March with 80%-90% and September being the least with 10%-20%

(Source: Atlas of Namibia, 2003)

5.1.2 Topography, Soils and Geology

The topography of the region is mainly mountainous. The elevation of the region is 868m above sea level. lithic leptosols soil which are very thin and shallow are the type of soils which dominate the study area. Leptosols typically form in actively eroding landscapes, especially in the hilly or undulating areas that cover much of southern and north-western Namibia (Mendelsohn 2000). Leptosols are coarse-textured

soils which are characterized by their limited depth caused by the presence of a continuous hard rock. The leptosols are, therefore the shallowest soils to be found in Namibia and they often contain much gravel. Their water holding capacity is low and vegetation in areas in which they occur is often subject to drought (Mendelsohn 2000). Leptosols can only support low densities of livestock and wildlife.

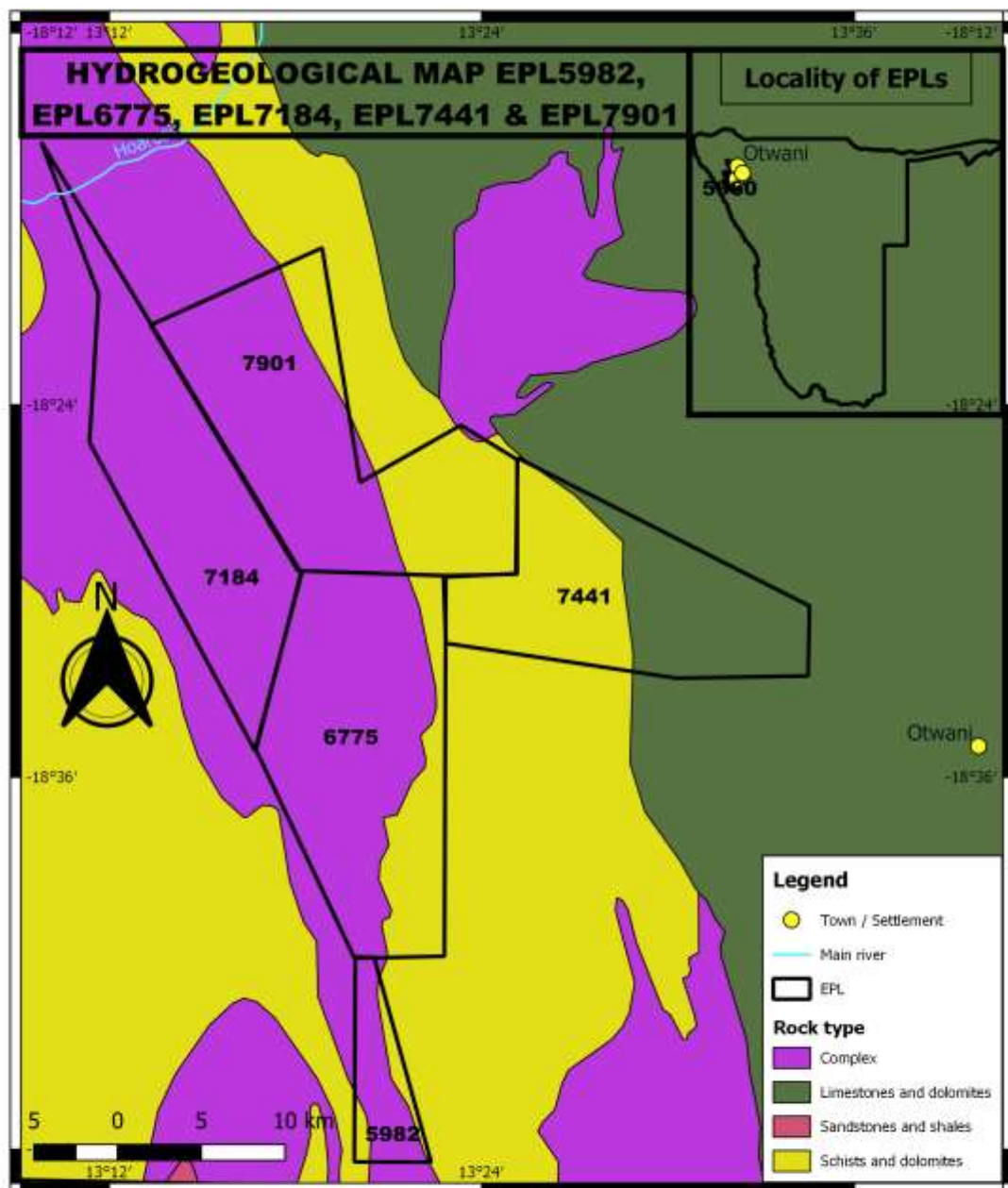
Geology of Kunene Region is classified mainly under the Otavi Group (Ls). Mendelsohn (2000) pointed that Kunene Region has the oldest rocks and the Damara supergroup and gariiep complex. Mendelsohn (2000) further point that besides diamond, all valuable minerals are found in the western side of the country. The study area however, is mainly dominated by base and rare metals. See table 5.2 which shows geology of the EPLs and possible types of mineral deposits. Also see figure 5.1, **hydrogeology map** for type of geology around the EPLs

Table 5. 2: Geology for the EPLs

EXCLUSIVE PROSPECTING LICENCE (EPL)	GEOLOGY	COMMODITIES
6775	Rhyolite,basalt,amphibolite,phyllite,limestone (Mok)	Base and Rare Metals, Dimesion Stone, Industrial Minerals, Precious Metals
7184	Lithology: para-/ortho-gneiss, metasedimentary rocks (Ve) Formation: kheisian	Base and Rare Metals, Dimesion Stone, Industrial Minerals, Precious Metals
7441	Lithology: dolomite,limestone, shale,chert (Nt), dolomite,limestone,shale,quartzite (Na), dolomite,limestone,shale,chert (Nt), diamictite,schist,iron formation,ortho-amphibolite,quartzite (Nc) Formation: Namibian	Base and Rare Metals, Dimesion Stone, Industrial Minerals, Non-nuclear fuel minerals
5982	Lithology:marble, schist ortho-amphibolite,quartzite(Nkb), para-/ortho-gneiss,metasedimentary rocks (Ve), rhyolite, basalt,amphibolite,phllite, limestone (Mok) Formation: okapuka, kheisian,karibib	Base and Rare Metals, Precious Metals
7901	Lithology:dolomite,limestone,shale,quartzite (Na) Formation: Namibian	Base and Rare Metals,Dimesion Stone,Industrial Minerals,Precious Metals,Nuclear fuel minerals,Semi-precious stones



Site image 2: Geology around the area



CONSULTANT	CLIENT
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Figure 5.1:Hydrogeology Map

5.1.3 Hydrogeology

Generally, the region has low groundwater potential aggravated by the sparse knowledge of the aquifers. The area however has springs that provide water for animals and the villagers. Around the EPLs there are no nearby ephemeral rivers except the Hoarusib River which passes on the north boundary of EPL 7184. See figure 5.1 for **hydrogeology map**.

5.1.4 Fauna and Flora

The area under study generally receives low rainfall which makes it difficult for animals to survive in such areas with little water for drinking. Generally small animals like goats are mainly domesticated which can feed on tree leaves and survive in arid like conditions. The area has been seriously affected by drought in recent years which resulted in death of livestock. However, table 5.3 below indicate the general fauna data for small creatures.

Table 5.3: Summary of General Fauna Data

Type of fauna	Number of different species/genera	Total around Namibia
Mammal Diversity	61-75 Species	217
Bird Diversity	111- 140Species	658
Reptile Diversity	51-60 Species	258
Frog Diversity	1-3 Species	50
Termite Diversity	7-9 Genera	19
Scorpion Diversity	12-13 Species	21

Source: *Atlas of Namibia (2003)*

Apart from that, Kunene Region is dominated by Acacia Tree and Shrub Savanna. The vegetation specifically falls under western highlands and the plant structure is grasslands and scattered trees. All the EPLs falls under western highlands **see vegetation map below**. For protected plant species obtained around the EPLs, see table 5.4 below. The proponent shall not be allowed to disturb the protected plant species in any way, all the activities to be done should cooperate the protected plant species. Poor rainfall over the years has affected the density and growth of vegetation in the area as shown on site images below.

Table 5. 4: Protected plant species

Species Name	Tree Name	EPLs	Occurrence
Acacia Erioloba	Camel thorn/ kameeldoring	5982	Common to abundant
Adsonia Digitata	Baobab	7441	Common to abundant
			Occasional occurrence
Albizia Anthelmintica	Worm-cure albizia/ Oumaboom		Common to abundant
		7441, 7901, 7184	Uncommon to rare occurrence
Berchemia Discolour	Bird Plum	7441, 7901, 7184, 5982	Uncommon to rare occurrence
Boscia Albitrunca	Shepherd's tree/ Witgat		Common to abundant
			Occasional occurrence
		7184, 7441, 5982	Uncommon to rare occurrence
Colophospermum mopane	Mopane	5982, 7184,	Common to abundant
			Uncommon to rare occurrence
Sclerocarya birrea	Marula	7901, 7441, 7184	Uncommon to rare occurrence
Ziziphus mucronate	Buffalo thorn / Wag-'n-bietjie	7901, 7441, 7184	Uncommon to rare occurrence



EPL 7901



EPL 7184

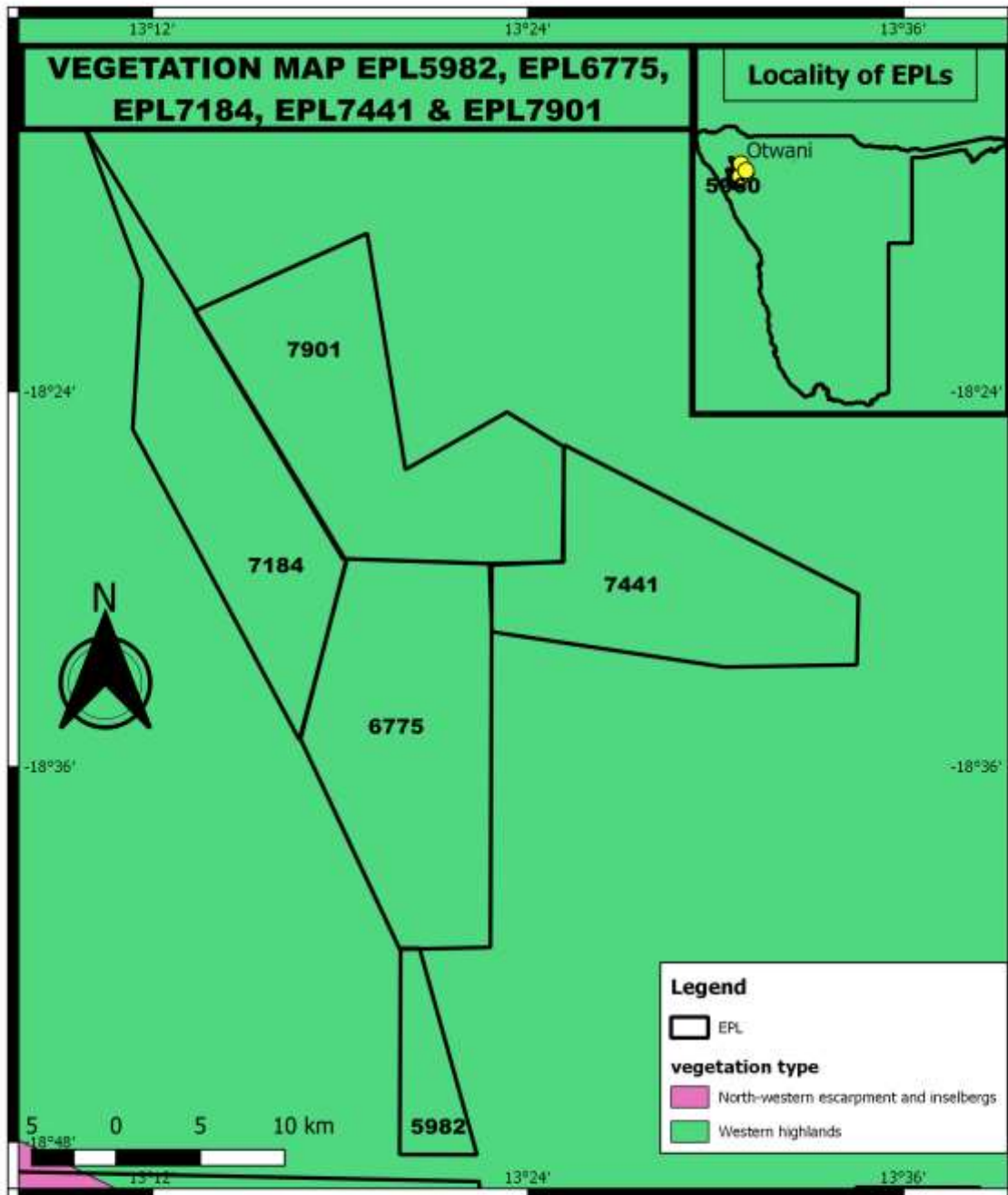


EPL 7441



EPL 6775

Site image 3: vegetation around the study area



CONSULTANT	CLIENT
 <p>EcoWise Environmental Consulting CC P.O.Box 40168 Ausspannplatz Windhoek Namibia ecowise@protonmail.com 081 382 6460</p>	<p>Kaoko Mining Namibia (Pty) Ltd P. O Box 1121 Tsumeb Namibia Cell: +264 67 220504 Fax: +264 67 220509</p>

Figure 5.2: Vegetation Map

5.15 Archaeology

The project area falls within Kaokoland in Kunene Region, northeast of Namibia. This section will therefore describe how the proponent will handle any unknown heritage sites that might fall within the proponent's EPLs. It is also worthwhile to note that currently there are no registered or declared heritage sites that fall within Kaoko Mining Namibia (Pty) Ltd.'s EPLs, see attached map below. In addition, previous archaeological work done around Kaokoland will also be discussed in brief.

According to the Heritage Act (27 of 2004), "heritage" is restricted to places and objects, including those of archaeological, cultural, historical, scientific and social significance. The act also defines "archaeological" as any remains of human habitation or occupation that are more than 50 years old found on or beneath the surface on land or in the sea, and especially notes rock art, being any form of painting, engraving or other representation on affixed rock surface or loose rock or stone which is 50 or more years old. It is essential to understand that the legal protection can extend beyond the archaeological object or site, to include the natural or existing condition or topography of land, as well as the trees, vegetation or topsoil. Kaoko Mining Namibia (Pty) Ltd shall therefore be responsible in persevering any archeological or heritage sites within their project area, in a case that they come across any. The Proponent shall bear in mind that, all archaeological objects are the property of the State and the ownership extends to all archaeological remains, known or unknown. It shall also be the responsibility of the Proponent to inform the exploration personnel and contractors about the legal status of archaeological remains and the obligation to report the discovery of any new archaeological remains to the National Heritage Council. Apart from that, during the exploration phase, the exploration personnel should be observant given that they might come across archaeological evidence.

The following should be observed as they might be clues to archaeological evidence; stone artefacts and stone features sites (settlements and graves).

In addition, the exploration team should be aware that archaeological sites commonly occur in these locations; rock outcrops and inselbergs, saddles, drainage lines, pans and dune fields and gravel plains.

a) Brief History of Archaeological work around Kaokoland

Archaeological work has been conducted around the Kaokoland area and significant archaeological evidence has been obtained. The most significant results in the Kaokoland were provided by excavations in a rock shelter, named Oruwanje 95/1 (Frank, in prep). Ovizorombuku 96/1 being another rock shelter was also excavated in 1998 (Vogelsang 1998). The stone artifact accumulation from the basal layers of this site were attributed to date back to an Early Holocene to Late Pleistocene **Age** (around 10,000 **B.P.**). The second trench at the site Ovizorombuku 96/1 after excavation produced a sheep bone, coming from one of the final spits. A charcoal sample from this spit was dated about 2500 B.P.

Another site discovered was Omungunda 99/1 which is situated near Opuwo town. With an extension of approximately 23 x 4 m, Omungunda 99/1 is the largest rock-shelter in the region and it was the first site with rock paintings in the Kaokoland (Vogelsang 1998). In addition, around 1999 other sites Hartmann's (N99/3) and Marienfluss valleys (N99/5) located on top of hills, were discovered and they had stone circles, potsherds, glass-beads and an iron arrowhead. According to Vogelsang (1998), a first radiocarbon date from a fireplace inside one of the hut-circles had an age of 230 years hence corresponding with the suspected date of the immigration of the cattle keeping Himba people from Angola. Apart from that, several clusters of stone circles were also discovered at a granite hill close to the border of the Skeleton-Coast Park.

b) Declared Heritage Sites in the vicinity of the proposed development

According to the data sourced from the website of National Heritage Council, there are six declared heritage sites in Kunene Region where Kaoko Mining Namibia (Pty) Ltd EPLs are located. See attached map below. The nearest declared heritage site (Dorsland Trekker Cottage) is approximately 56km from the nearest EPLs 7441 and 7901. Of the known heritage sites, none overlays any of the EPLs for Kaoko Mining Namibia (Pty) Ltd.

c) Unknown Heritage Sites

It is essential to note that, within the EPLs, there might be unknown heritage sites. The Proponent will consult with the headman of the area before conducting any work as their knowledge will be of great importance in identifying some sites of significance such as their holy grounds and graves. In addition, given that the Proponent comes across unknown heritage sites within the EPLs, the proponent will follow the following procedures:

Action by person identifying archaeological or heritage material

- If operating machinery or equipment, stop work
- Identify the site with flag tape
- Determine GPS position if possible
- Report findings to foreman

Action by Foreman

- Report findings, site locations and actions taken to superintendent
- Cease any work in immediate vicinity

Action by superintendent

- Visit site and determine whether work can proceed without damage to findings
- Determine and mark exclusion boundary
- Record coordinates for the site for confirmation by archaeologist

Action by Archaeologist

- Inspect site and confirm recorded coordinates
- Advise National Heritage Council (NHC) and request written permission to remove findings from work area
- Recover, package and label findings for transfer to National Museum

In the event of discovering human remains:

Action as above

- Field inspection by Archaeologist to confirm that remains are human
- Advise and liaise with NHC and Police
- Recover remains and remove to National Museum or National forensic Laboratory, as directed

d) Management of “no-go areas”

Currently there are no declared or registered heritage sites that overlap or coincide with our proposed project area, hence this section at the moment does not apply to this project.

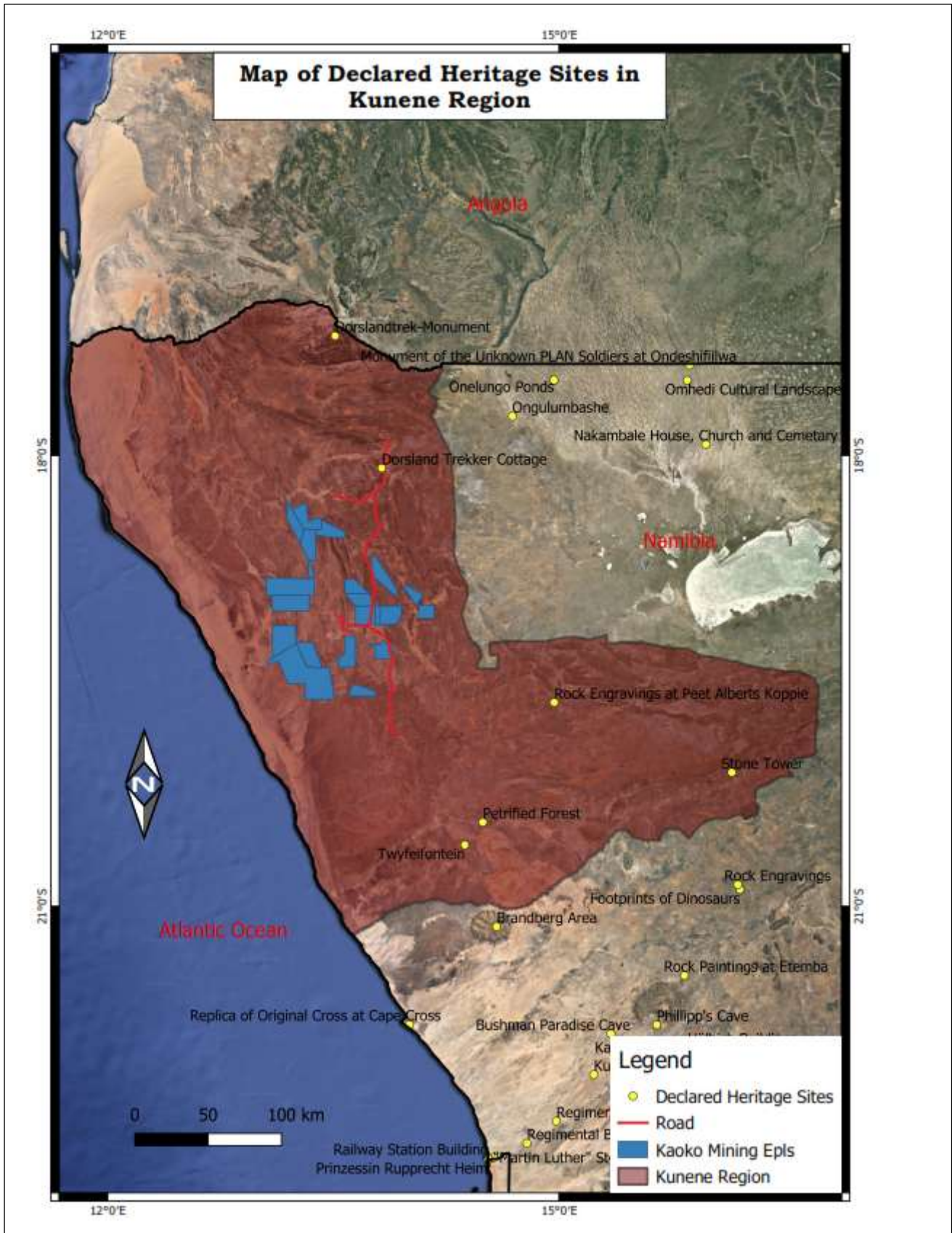


Figure 5.3: Declared Heritage Sites in Kunene Region

5.2 Social Environment

Kunene Region is located on the northwest of Namibia and the Skeleton Coast Park forms its entire west coast on the Atlantic Ocean. The following six political constituencies comprises Kunene Region, Opuwo, Sesfontein, Epupa, Khorixas, Kamanjab and Outjo. Outjo is classified under municipality, Khorixas and Opuwo as towns, Kamanjab as a village. Sesfontein, Fransfontein and Okangwati have been proclaimed and targeted for urban development. Opuwo Rural is an electoral constituency in the Kunene Region and its' administrative centre is the settlement of Otwani. It is essential to note that, the EPLs are mainly surrounded by open spaces and mountains.

The population of Kunene Region was 86 856 of which 43 253 are female and 43 603 are males (NPC 2011). According to NPC (2011), there was an increase in population from 2001 (68 735) to 2011 (86 856). The population is mainly dominated by young people less than 15 years of age. This implies that there is need to bring more projects so as to create employment for the youths. Apart from that, by region, Kunene Region among the other regions has the lowest percentage of people living with HIV. By region it has 9.7% people living with HIV/AIDS (MHSS 2015).

On the education sector, the region has very few schools with poor educational facilities. According to (EMIS, 2012) there are 41 Primary schools, 12 Combined school and 6 Secondary schools, in total there are 120 schools which is too low as compared to other regions. In addition, of the population aged 6 years and above in Kunene Region, 35.9 % never attended school, 50% left school and 9% are currently at school (NPC 2011). The major problem in the region is shortage of schools such that learners travel long distances to school which might be a factor to high dropouts in the region.

Furthermore, many people in the region rely on wages and salaries. According to NPC (2011), 64 % of the economically active population aged 15 years and above are employed and 36% unemployed in Kunene Region. Tourism in the area of study, mainly comes from Himba villages and Kaokoland. In terms of services and infrastructure, water is sourced from boreholes. The C43 road from Opuwo to Sesfontein is the one which links to the site. There are no powerlines near the study area.

6 PUBLIC CONSULTATION

6.1 Objective:

Public consultation forms an important component of an Environmental Assessment (EA) process. Public consultation gives a platform to potential Interested and Affected Parties (I&APs) 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 is also a tool which is used by the Environmental Assessment Practitioner (EAP) to identify potential impacts associated with the project and also possible mitigations measures.

6.2 Approach:

a) Interested and Affected Parties (I&APs)

Interested & Affected Parties were identified by the consultant and these included; Ministry of Environment and Tourism, Ministry of Mines and Energy, Kunene Regional Council, Traditional leaders and locals. In addition, notices regarding the project were placed in widely circulated national

newspapers for two consecutive weeks inviting members of the public to register as Interested and Affected Parties (I&APs). **See Appendix A**, adverts.

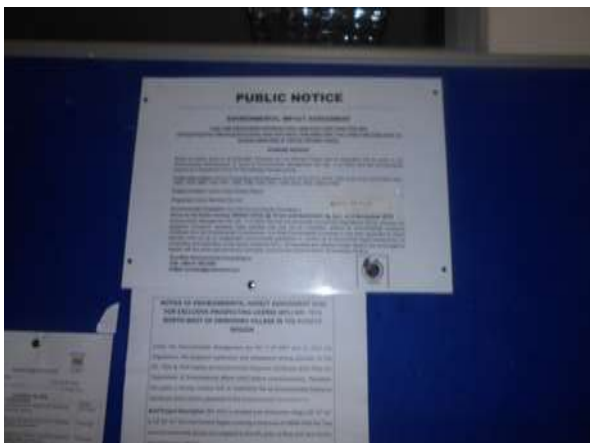
b) Notification with Interested and Affected Parties

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. I&APs were notified through the following means:

Background Information Document (BID) - is a short document, which briefly gives the background of the project. The BID was circulated to I&AP and the main aim of distributing the BID is to bring awareness and clarity about the proposed project. A copy of the BID is provided in Appendix A.

Advertisement- notices were placed two times in The Namibian and New Era dated 28 October 2019 and 4 November 2019 see (Appendix A, adverts).

Site Notices – notices with project information were placed at Kunene Regional Council, Otwani Clinic and around the villages as shown below.



Site image 4: Public notices at Kunene Regional Council and Otwani Clinic respectively

Public meeting – it was announced in The Namibian and New Era. The meetings were held on 2 November 2019 at Otwani Rural District Council (Otwani), Sesfontein Conservancy (Sesfontein) and Otjapitjapi village as shown on site images below. For more information on issues raised during the meetings, **see Appendix A**, Meeting Minutes.

Questionnaires- they were also distributed amongst the participants so as to gather more information on their views towards the project. Distribution of questionnaires was also done to allow stakeholders to air their views privately. The questionnaires are attached in **Appendix A**.

The scoping report - it was made available to all I&APs including the client.



Site image 5: Stakeholder meeting at Otjapitjapi village



Site image 6: Stakeholder meeting at Sesfontein Conservancy



Site image 7: Stakeholder meeting at Otwani Rural District Council

6.3 Summary of Interested & Affected Parties Concerns

During the public participation process, all people viewed the project as beneficial to the community. For more issues raised during the public participation process, see **Appendix A, Meeting Minutes for both the three meetings**. In summary, the following major issues were brought forward:

Employment

Many participants recommended that locals be employed by the proponent. However, it is essential to note that during the exploration phase two people (geologist and assistant) will be employed permanently by Kaoko Mining Namibia Pty Ltd. During this phase, personnel with experience mainly in geology will be required hence the need to employ experienced staff. Therefore, during this phase, employment might not be created unless in cases whereby cut lines are created for accessibility to some areas. Employment will be mainly created in future thus during mining phase.

Relations with the community and communication

Mr. Elago Hamnjela (Administrative officer at Kunene Regional Council) also pointed out that, the company should remain friendly to the community and communication should always be maintained. Concerning this issue, the proponent promised to keep good relations with the community. The proponent also highlighted that if they get permission to start exploration activities, they will always notify the headman before working in their area. The proponent also noted that communication with the headman will always be vital given that they will always want to know if there are any holy grounds in the area before any works.

Joining the company

Participants in Otjapitjapi village were mainly concerned about joining the company and registering their EPLs and mining claims. In response, the proponent indicated that for now its too late as the EIA is already underway.

Community development

Traditional authorities were mainly concerned about community development. Chief Kaenda Herunga of Otjikukutu emphasized that, the proponent should develop schools, roads, waterpoints and kindergartens. Given that the proponent decides to conduct mining activities in future, social responsibilities should be fulfilled.

Encroachment of boundaries

Another issue which was raised during the public meeting was encroaching boundaries. It is essential to note that the proponent shall not be allowed to encroach on other EPLs which are not part of their sites. The proponent shall use maps and GPS to see the boundaries of their EPLs.

Project description

Mr. Wassenaar emailed requesting the kml file and it was sent to him. He further required clarification on the exploration activities to be done. See Appendix B, response. It is essential to note that, it was decided that both methods which are limited trenching and drilling will be used.

Trenching will only be used to understand the surface geology and drilling will be used to understand the subsurface geology. Limited trenching will only be done after the geologist confirms that there is potential ore deposits basing on reconnaissance of the rocks. This implies that no unnecessary trenching shall be done.

6.4 Stakeholders’ Recommendations

Conducted traditional authorities recommended the project to go ahead but the proponent was tasked to employ locals and bring development to the community.

7. IMPACTS IDENTIFICATION, DESCRIPTION AND ASSESSMENT

7.1 Impact Assessment Methodology

The proposed exploration 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). The methodology, which was used to assess impacts and alternatives, include the following:

- Public participation
- Site visit
- Professional experience

7.2 Identification of Potential Impacts of the Project

<p>Positive Impacts</p> <ul style="list-style-type: none"> - Local empowerment - Employment creation. - Community development - Land utilization for the benefit of people 	<p>Negative impacts</p> <ul style="list-style-type: none"> - Air Environment - Dust - Noise - Land Environment - Impact on landscape - Vegetation loss - Generation of waste - Impact on fauna - Impact on soil Water Environment - Impact on surface and groundwater sources Socio -Economics - HIV/AIDS - Occupational Health and Safety risks. - Heritage impact - Population influx - Indirect Impacts - Cumulative impacts
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7.3 Impact Analysis

In this section, the impacts of the proposed project on human and biophysical environment are evaluated and analyzed. Following the identification of the various potential environmental impacts, the impact analysis framework looked at the impacts under the following categories;

Table 7.1 : Ranking Matrix

	Temporal scale		Score	
EFFECT	Short term	Less than 5 years	1	
	Medium term	Between 5 and 20 years	2	
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.	3	
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there.	4	
	Spatial Scale			
	Study area	The proposed site /within immediate area of the activity	1	
	Beyond project boundary	Surrounding area outside the project boundary	2	
	Regional	District and Provincial level	3	
	National	Country	4	
	International	Internationally	5	
	Severity		Benefit	
	Slight/Slightly Beneficial	Slight impacts on the affected system(s) or party(ies)	Slightly beneficial to the affected systems(s) or party(ies)	1
	Moderate/Moderately Beneficial	Moderate impacts on the affected system(s) or party(ies)	An impact of real benefit to the affected system(s) or party (ies)	2
	Severe/Beneficial	Severe impacts on the affected system(s) or party(ies)	A substantial benefit to the affected system(s) or party(ies)	4
Very Severe/Very Beneficial	Very severe change to the affected system(s) or party(ies)	A very substantial benefit to the affected system(s) or party(ies)	8	
Likelihood				
LIKELIHOOD	Unlikely	The likelihood of these impacts occurring is slight	1	
	May occur	The likelihood of these impacts occurring is possible	2	
	Probable	The likelihood of these impacts occurring is probable	3	
	Definite	The likelihood is that this impact will definitely occur	4	

Table 7.2: Ranking matrix for Environmental Significance

Environmental Significance		Positive	Negative
LOW	An acceptable impact for which mitigation is desirable but not essential. The impact by itself is insufficient even in combination with other low impacts to prevent development.	4-7	4-7
MODERATE	An important impact, which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which, in conjunction with other impacts may prevent its implementation.	8-11	8-11
HIGH	A serious impact, which, if not mitigated, may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually long-term change to the natural and/or social environment and result in severe negative or beneficial effects.	12-15	12-15
VERY HIGH	A very serious impact, which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often, these impacts are unmitigable and usually result in very severe effects or very beneficial effects.	16-20	16-20

Table 7.3: Matrix to show environmental significance

	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4	7	8	9	10	11	12	13	14	15	16	17	18	19	20

7.4 Impact Evaluation

7.4.1 Negative impacts associated with exploration phase:

1. Impact on fauna

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact			
Impact on fauna Unmitigated	Short term	1	Study area	1	Moderate impact	2	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	2	5

Noise might be created from exploration activities like drilling and movement of vehicles which might consequently disturb animals in the area. Creating cutline in instances where accessibility for vehicles is required can also lead to habitat loss especial for small animals. Large animals are expected to be less affected in terms of habitancy given that no massive clearance shall be done. The impact is expected to be of low environmental significance if mitigation measures are implemented. If the proponent abides to the plan, that no new roads will be created and no massive vegetation clearing shall be done, the impact will be manageable.

Mitigations and recommendation

- Working hours should be limited to during the day, thus enabling the wildlife to roam freely at night.
- No massive clearance shall be allowed

2. Vegetation loss

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Vegetation Loss Unmitigated	Medium term	2	Study area	1	Slight impact	1	May occur	2	6
Mitigated	Medium term	2	Study area	1	Slight impact	1	Unlikely	1	5

Clearing of vegetation shall not be done. However, vegetation might be lost through the following activities, creation of cut lines for accessibility of vehicles, limited trenching and drilling. Protected plant species are most severely affected since the slightest disruption in their habitat can result in extinction. The proponent should therefore identify these protected species and cooperate them in the project.

Mitigations and recommendation

- Protected plant species should not be removed but preserved and the activities should fit into the environment without affecting the protected trees.
- Massive clearing shall not be allowed

3. Impact on landscape

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Impact on landscape Unmitigated	Short term	1	Study area	1	Moderate impact	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Exploration activities ie drilling and limited trenching will leave scars on the landscape. Disturbance on the land can consequently affect animals in the area in terms of their habitancy and also the general aesthetic value of the land. Less harm is generally expected during the exploration phase given that trenching shall be limited and done at a small scale with the use of shovels and picks. If mitigation measures are implemented, the impact will reduce from medium to low environmental significance.

Mitigations and recommendation

- Limited trenching should be done to understand the surface geology but when need arise to understand the subsurface geology, drilling should be used.
- Removed rocks and soil should be replaced back and levelling of the area done so as to try to restore the area to its natural state.

4. Dust

Identified Impact	Effect					Risk Likelihood	or Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact			
Dust Unmitigated	Short term	1	Study area	1	Slight impact	1	Probable 3	6
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur 2	5

Exploration activities which might generate dust are expected to be the following, movement of vehicles given that the roads are dust roads, drilling and limited trenching. The severity of the impact is expected to be slight such that it will not affect by-passers. Employees working in the area are the ones who might be at risk hence they are expected to cover themselves with dust masks to avoid contracting diseases like pneumoconiosis.

Mitigations and recommendation

- Soil watering when soil works are being executed and where dust is emitted
- People at site should be provided with respirators
- Regular monitoring and review to ensure safe operation

5. Noise impact

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Noise Unmitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

Noise might be produced from movement of vehicles and drilling. Drilling machines can produce noise of about 95- 100 decibels hence the normal levels of 55 decibels recommended by World Health Organization (WHO) might be surpassed. Noise generated is not expected to affect outside the boundaries but it might affect employees working at the site hence posing a risk of ear damage. However, the impact of noise will remain of low environmental significance if mitigation measures are implemented.

Mitigations and recommendation

- A drilling interval should be established, used and adhered to and working hours should be limited to minimum of 8 hours per day
- Noise should be addressed and mitigated at an early stage.
- Proper and timely maintenance of machineries and vehicles
- Employees should be equipped with ear protection equipment.

6. Impact on soil

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Soil Unmitigated	Short term	1	Study area	1	Moderate impacts	2	Definite	4	8
Mitigated	Short term	1	Study area	1	Slight impacts	1	Definite	4	7

Drilling and limited trenching will definitely disturb the soil on the sites. Soil might also be partly affected by oil or fuel leakages from vehicular and drilling machines. The impact is expected to affect only the study area and it will be definite that soil will be disturbed. The significance can be reduced from medium to low if mitigation measures are implemented.

Mitigations and recommendation

- After completion of exploration activities such as trenching, removed soil layers must be replaced and levelling must be done so that the original condition is restored.
- Proper care should be taken so that there is no spill that would cause soil contamination
- If any hazardous waste is produced it should be properly handled and sent for disposal to appropriate disposal areas
- Fuels shall not be kept/stored at the site

7. Impact on surface and groundwater sources

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Surface & groundwater Unmitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

Improper handling and disposal of hydrocarbon products and hazardous materials at the site may lead to groundwater contamination, in case of spills and leakages. Risk of hydrocarbon spillages might come from vehicles and drilling machine. On the north boundary of EPL 7184 there is an ephemeral river (Hoarusib River), hence there is need to take all precautionary measures so as to avoid any spillages which might end up contaminating the flows of the river thus during its time of flow.

Mitigations and recommendation

- Storage of oils and fuel on site shall not be allowed.
- Implement a maintenance programme to ensure all vehicles, machinery and equipment remain in proper working condition and maintenance should be conducted in designated areas only, preferably off-site.
- Waste oils and fuels from drip trays on stationery vehicles and machinery should be disposed of as hazardous waste at a licensed facility by a specialist hazardous waste handler.

8. Waste generation

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact			
Waste generation Unmitigated	Short term	1	Study area	1	Moderate impact	2	4	8
Mitigated	Short term	1	Study area	1	Slight impact	1	1	4

Exploration activities such as trenching will definitely produce waste in the form of unearthed rocks and soils. Waste might also be generated in the form of oils, fuel, food leftovers, papers and plastics. It is definite that waste shall be generated from unearthed rocks and soil but if mitigation measures are implemented such as making sure that after completion of exploration activities such as trenching, removed soil layers are replaced and levelling are done so that the original condition is restored, the impact will be of low environmental significance.

Mitigations and recommendation

- Contaminated wastes in the form of soil, litter and other material must be disposed off at an appropriate disposal site.
- Strictly, no burning of waste on the site or at the disposal site is allowed as it possess environmental and public health impacts
- After completion of exploration activities such as trenching, removed soil layers and rocks must be replaced and levelling must be done so that the original condition is restored.

7.4.2 Negative socio-economic impacts associated with exploration phase:

1. Occupational Health and Safety Risks

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance	
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
O.H.S Unmitigated	Short term	1	Study area	1	Moderate impacts	2	May occur	2	6
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4

Noise, dust and occupational stress are hazards, which are likely to be encountered during the exploration phase. Dust might be emitted during trenching and frequenting vehicles. Dust generated is not expected to go outside the EPLs boundaries hence people at risk will mainly be employees working in the area. Moreover, work pressure on employees can cause stress hence resulting into accidents. The proponent is therefore expected to, provide employees with appropriate personal protective clothing and allow employees to work on designated time according to the Labor Act.

Mitigations and recommendation

- Conduct Hazard identification and risk assessments
- Comply with all Health and Safety standards specified in the Labor Act.
- Provide all staff on site with protective equipment (helmets, gloves, respirators, work suits, earplugs, goggles and safety shoes where applicable).
- Use of dust suppression measures
- Reduce noise exposure by isolating noisy equipment and rotate tasks
- Provision of the following, First Aid at the site, safety posters at conspicuous places and immediate accident/incident investigation reporting.

2. Population Influx

Identified Impact	Effect						Risk Likelihood	or	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score				
Population Influx Unmitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	1	5	
Mitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	1	5	

The proponent is expecting to hire a few people given that this stage of the project is not labor intensive as compared to mining. The proponent will hire two permanent employees (geologist and assistant to the geologist), contractors for drilling and locals for manual labor when the need arises. Therefore, the impact of population influx is expected to remain of low environmental significance.

Mitigations and recommendation

- Local employment should be a priority so as to reduce the number of outsiders entering Opuwo area

3. Heritage impact

Identified Impact	Effect						Risk Likelihood	or	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score				
Heritage impact Unmitigated	Short term	1	Study area	1	Moderate impact	2	May occur	2	6	
Mitigated	Short term	1	Study area	1	Slight impact	1	Unlikely	1	4	

There are a number of archaeological works and declared heritage sites within the vicinity of the proposed development area but since none of these are on the EPLs, the impact on the existing archaeological and heritage sites is limited. Potential impacts on unknown archaeological and heritage sites might arise during the removal of topsoil thus during limited trenching and drilling. However, the overall significance of this impact is expected to be low given that trenching shall be limited and only used to understand the surface geology whilst drilling will be

used to understand the subsurface geology. Moreover, the exploration personnel will first walk around and identify areas of interest and on those targeted areas, trenching and drilling shall be applied hence reducing the area of land to be disturbed.

Possible areas where archaeological artifacts might be found include areas along an ephemeral river (Hoarusib River) on the north boundary of EPL 7184. Historically, people settled near water sources for easy accessibility for domestic use.

It is essential to note that, no construction shall be done during the exploration phase hence minimizing the impact on unknown archaeological heritage. The Proponent will also use already existing tracks and in an event that the tracks need rehabilitation, they will only be upgraded.

To note, if the Proponent come across archaeological features or objects that possess cultural values (e.g. Pottery, bones, shells, ancient clothing or weapons, ancient cutlery, graves etc.), the area should be barricaded off and the National Heritage Council of Namibia should be contacted immediately.

Mitigations and recommendation

- The Proponent should consult the headman of the area before conducting any work.
- All works are to be immediately ceased 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.

4. Risk and spread of HIV/AIDS

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact			
HIV/AIDS Unmitigated	Short term	1	Regional	3	Severe impact	4	May occur	10
Mitigated	Short term	1	Beyond project boundary	2	Slight impact	1	Unlikely	5

Even though a few employees will come to work in the area, but the virus can still spread. Anti-social behaviours like prostitution might be practised hence the probability of spreading HIV/AIDS. If mitigation measures are implemented, it will be unlikely that the virus will spread and the impact will be of low significance.

Mitigations and recommendation

- Employer should allocate time for employees to visit their families.
- Free distribution of condoms

5. Cumulative Impacts

Identified Impact	Effect						Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact	Score			
Cumulative impacts Unmitigated	Short term	1	Study area	1	Moderate impact	2	Probably	3	7
Mitigated	Short term	1	Study area	1	Slight impact	1	May occur	2	5

Alternation of existing landscape caused by limited trenching and drilling might impact on archaeological heritage and also result in loss of habitancy for some animals which can further affect the food web. The greatest potential impact of the proposed development on the archaeological heritage of the surrounding landscape will be during the removal of topsoil during limited trenching and drilling on identified areas of interest with possible mineral deposits. The proposed works will have a negative archaeological impact on undisturbed areas of ground where topsoil will be removed.

Mitigations and recommendation

- Limited trenching should be done to understand the surface geology but when need arise to understand the subsurface geology, drilling should be used.
- The Proponent will need to monitor, by seeking consultation from an archaeological consultant during topsoil removal over relatively large areas so as to ensure the full recognition and recording of any buried finds or features.
- Removed rocks and soil should be replaced back and levelling of the area done so as to try to restore the area to its natural state

7.4.3 Positive impacts associated with the project

1. Employment creation

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance	
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Employment creation Unmitigated	Short term	1	National	4	Very beneficial	8	Definite	4	17
Mitigated	Short term	1	National	4	Very beneficial	8	Definite	4	17

Employment will be created during the exploration phase. Job type will range from skilled, semi-skilled and unskilled. Geologist and the assistant will be considered as the permanent employees of the company. Contractors for drilling and locals for manual labour will work on a contract basis.

2. Local Empowerment

Identified Impact	Effect					Risk or Likelihood	Score	Overall Significance	
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Local Empowerment Unmitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19
Mitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19

It is definite that the project will promote local empowerment. The shareholders of Kaoko Mining Namibia (Pty) Ltd are all Namibian citizens who managed to group their licenses together in a bid to explore for the possible discovery of a medium to large minable copper deposit.

3. Land utilization for the benefit of people

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Land utilization for the benefit of people Unmitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19
Mitigated	Permanent	4	Regional	3	Very beneficial	8	Definite	4	19

The EPLs were granted to the locals but most of the shareholders did not have funds to start exploration activities. Therefore, the formation of the company helped most of the shareholders. Given that exploration activities are done and minable deposits are obtained, this can result in utilisation of the land hence benefiting the people.

4. Generation of Revenue

Identified Impact	Effect					Score	Risk or Likelihood	Score	Overall Significance
	Temporal Scale	Score	Spatial Scale	Score	Severity of impact				
Revenue Unmitigated	Permanent	4	National	4	Very beneficial	8	Definite	4	20
Mitigated	Permanent	4	National	4	Very beneficial	8	Definite	4	20

Revenue will be generated through taxes. Kaoko Mining Namibia (Pty) Ltd and contractors will pay tax hence generating revenue.

7.4.4 Post-Exploration Phase

Post-exploration phase will present the following negative impacts, alteration of the landscape/visual impact and loss of employment. However, the stage of exploration is expected to have minimum damage to the environment as compared to mining. Nevertheless, pits created during limited trenching need to be rehabilitated. The following shall be done as a way to restore the environment:

- ✓ Rehabilitation of the site to acceptable standards should be commenced once exploration works cease.
- ✓ All pits shall be backfilled or contoured to a stable angle of repose.
- ✓ Stockpile disturbed bedrock on site in a safe and stable manner.
- ✓ Landowners shall be consulted to indicate acceptance of the rehabilitation.

Pertaining the impact of loss of employment, the proponent will have to implement the following measures:

- ✓ The Proponent should inform the employees on time, on the intentions to cease the exploration works and the expected date of such closure. This will provide the employees with enough time to search for work elsewhere.
- ✓ The Proponent should raise awareness of the possibilities for work in related industrial sectors.

7.5 Summary & Analysis of Impacts

In conclusion, the proposed exploration project will present impacts which will be manageable if the Proponent implement the EMP. If the mitigation measures are implemented the following impacts, impact on landscape, fauna, soil, waste and HIV/AIDS will move from moderate to low environmental significance. Furthermore, in order to maintain low significance, the implementation of measures will need to be continuously monitored.

8. ENVIRONMENT MANAGEMENT AND MONITORING PLAN

Environmental planning and management as a concept seek to improve and protect environmental quality for both the project site and the neighborhood through segregation of activities that are environmentally incompatible. EMP is a vital output for an Environmental Impact Assessment as it provides a checklist for project monitoring and evaluation.

Environmental Management Plan (EMP) for the proposed project is aimed at providing a logical framework within which identified negative environmental impacts can be mitigated and monitored. **See Appendix C**, for the EMP.

9. CONCLUSION AND RECOMMENDATIONS

9.1 Conclusion

In conclusion, potential impacts which might be related to the project were identified and assessed. If the proponent implements all the mitigation measures proposed in the EMP, the identified impacts will be manageable and of low environmental significance.

9.2 Recommendation

Based on the information provided in this report, the consultant is confident the identified risks associated with the proposed development 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. In addition, environmental audits by an independent environmental consultancy must be carried out during the exploration phase to monitor environmental compliance. The monitoring and audit reports should accompany the application for renewal of the environmental clearance certificate after 3 years.

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