

By:

Hilya Amukwa
Environmental Practitioner

Martha Haludilu
Information Specialist

**ENVIRONMENTAL IMPACT
ASSESSMENT REPORT FOR
EXCLUSIVE PROSPECTIVE LICENSE
(EPL 8759)
ERONGO REGION**

Table of Contents

EXECUTIVE SUMMARY	1
INTRODUCTION	3
Figure 1 Map showing the location and the relative extent of the EPL	3
SCOPE OF THE STUDY	3
OBJECTIVES OF REPORT	4
THE ROLE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)	4
THE ROLE OF THE PROPONENT	5
ADMINISTRATIVE AND LEGAL FRAMEWORK	5
DESCRIPTION OF THE PROJECT	7
LOCATION	7
Figure 2 Farm Map	7
Figure 3 Corner coordinates of EPL 8759	9
Figure 4 Locality map.....	9
THE RECEIVING ENVIRONMENT	10
GEOLOGICAL SETTING	10
Figure 5 Geological map.....	10
ENVIRONMENTAL OVERVIEW	10
Climate	11
<i>Precipitation</i>	11
<i>Potential / actual impacts</i>	11
<i>Wind</i>	11
<i>Rainfall and Temperature</i>	12
<i>Topography and Drainage</i>	12
Figure 6 showing a drainage area close to the EPL 8759	13
BIOLICAL ENVIRONMENT	13
Flora and Fauna	13
Figure 7	14
SOCIO-ECONOMIC ENVIRONMENT	14
Figure 8 Economic map.....	15
Figure 9 Farmhouses cutting within the EPL 8759 area	16
PROJECT DESCRIPTION	16
STAKEHOLDER CONSULTATION	19
Figure 10 Site meeting with the headman.....	21
IMPACT ASSESSMENT	21
Conclusion	49

REFERENCES.....	51
APPENDIX A: SITE NOTICE PLACEMENTS AND NEWSPAPER ADVERTISEMENTS.....	52
Appendix B: Background Information Document	54
Appendix C Heritage Council Consent Letter and Archaeologist report.....	55
Appendix D Attendance register and communication.....	56
Appendix E Stakeholder List.....	57
Appendix F EMP.....	58

EXECUTIVE SUMMARY

The proponent propose to undertake exploration activities on Exclusive Prospecting Licence (EPL) 8759 for base and rare metals, industrial minerals, and precious metals in the Daures constituency, Erongo Region. The EPL 8759 is located 86 km northeast of Arandis and 70 km southwest of Usakos, and it can be easily accessible via the D1930 road.

The proposed project triggers listed activities in terms of the Environmental Management Act No. 7 of 2007, therefore an Environmental Clearance Certificate is required. As part of the Environmental Clearance Certificate application, an Environmental Impact Assessment has been undertaken in compliance with the Environmental Management Act No. 7 of 2007 and its associated regulations. This Environmental Scoping Report and Environmental Management Plan shall be submitted to the competent authority as part of the application for the Environmental Clearance Certificate.

The proposed project will entail exploration methods on EPL 8759 which will include: detailed geological mapping, electromagnetic and geophysical surveys, drilling and core sampling. If required, some vegetation may be cleared to allow access tracks and working areas to be created and for the installation and development of exploration drill holes. The duration of exploration activities is anticipated to be conducted over the course of a 3-year period, which also the duration of the EPL 8759 validity. The duration of each exploration programme shall be refined when detailed geological information are available. Once the exploration is successful and feasible, exploration operations can potentially transcend into mining a separate detailed Environmental Impact Assessment.

The EPL 8759 is within the Acacia Tree-and-Shrub Savanna biome and has Karstveld and Thornbush Shrubland vegetation types. It also supports a 'medium-low' terrestrial diversity of animal and plant life compared to the rest part of Namibia. The plant diversity in the EPL 8759 and vicinity has a few species due to the area receiving less rainfall than other areas in the country. The EPL covers an area of ~ 17782 Ha over the farm Twyfel , Vrede , Ootmoed , Schwarz Spitzkoppe , Oberwasser , Okambahe Reserve and Harmonie with land use dominated by small-scale livestock farming and wildlife.

This environmental and social impact assessment was undertaken using a methodology as per the Environmental Management Act and international best practices. The scoping process

also includes a desktop review and field assessments during the site visit. Insignificant sensitive receptors were identified during the scoping process – and the only potential environmental risks that may require further investigation were dust, noise, health and safety, visual, land use, waste, ecological, groundwater and surface water, heritage and socio-economic.

After further investigation, it was determined that the potential effects from the activities that will take place on EPL 8759 were considered to be of minor significance, once mitigations are implemented as summarised in the EMP which includes, but are not limited to:

- Local community shall be provided at least two weeks' notice of drilling operations and avoid drilling within 1km of their property.
- Regular communication with local community in order to identify any concerns or issues, and appropriate mitigation and management measures shall be further agreed.

The potential effects are therefore deemed not significant, localised if mitigation measures are complied with, thus the assessment is considered to be comprehensive and sufficient – thus no further assessment is required. Therefore, it is of the opinion of the environmental assessment practitioner (EAP) that an environmental clearance certificate could be issued, on conditions that the management and mitigation measures specified in the EMP are implemented and adhered to

INTRODUCTION

The proponent proposes to undertake exploration activities on Exclusive Prospecting License (EPL) 8759 in the Erongo Region, with interest in base and rare metals, dimension stones, industrial minerals and precious metals. The EPL is located about 86.05 km north northeast of Arandis and about 70 km southwest of Usakos. It covers an area of 17782.2417 Ha and extends over the following Farms, namely: Twyfel, Vrede, Ootmoed, Schwarz Spitzkoppe, Oberwasser, Okambahe Reserve and Harmonie

The Exclusive Prospective Licence (EPL) was granted by the Ministry of Mines and Energy, but activities may not commence prior to the completion of an Environmental Impact Assessment (EIA) and the issuance of environmental clearance in accordance with the Environmental Management Act of 2007.

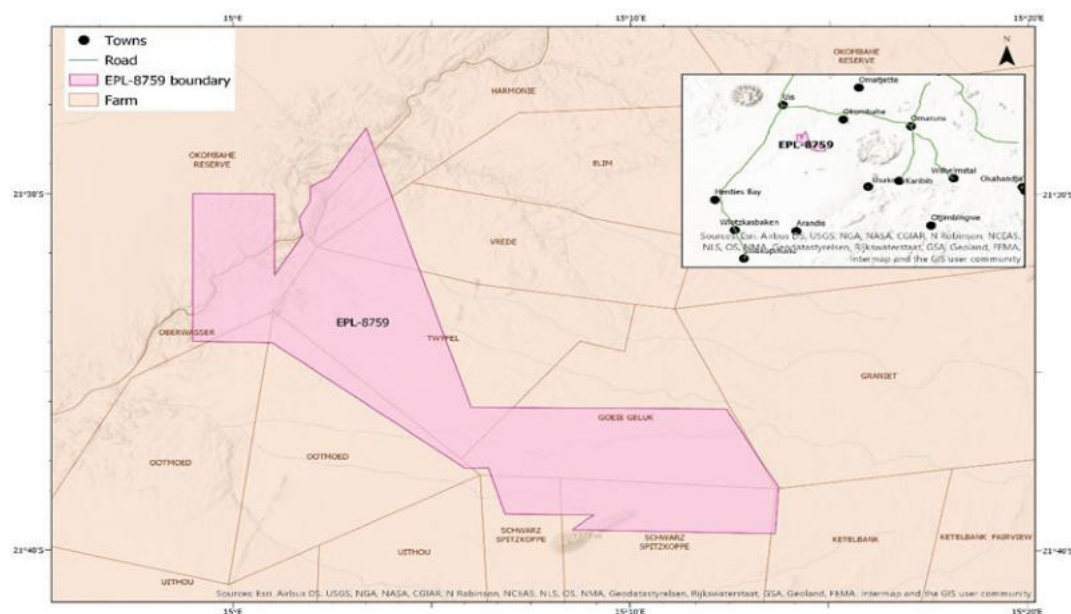


Figure 1 Map showing the location and the relative extent of the EPL.

SCOPE OF THE STUDY

The scope of the EIA is to determine the potential environmental impacts arising from the proposed activities by doing a risk assessment. Relevant environmental data has been compiled by making use of secondary data from desktop work and limited field work. Existing fauna and flora data from the national database was used to assess the impacts on biodiversity. The EIA Report and EMP will enable stakeholders to make informed judgements regarding the exploration activities from an environmental perspective.

OBJECTIVES OF REPORT

The objective of this assessment was to establish baseline environmental conditions and understand the potential impacts that could arise from the proposed activities of the various phases of the project. Additionally, it is to provide The Ministry of Environment and Tourism with the assessment document in order for the Environmental Commissioner to issue an Environmental Clearance Certificate (ECC) for the exploration activities on EPL 8759. Possible environmental impacts were identified and assessed with recommendations on appropriate mitigation measures.

Some objectives of the Environmental Impact Assessment study were:

- To define the project scope
- To recognize and measure any potential destruction to flora, fauna and natural surroundings;
- To highlight the positive inputs towards the Namibian economy through employment creation and foreign capital gains through investments
- To plan the provision of infrastructure and develop mitigation measures to minimize pollution, environmental disturbance and nuisance during the various phases of the project
- To recognize, assess and specify methods, measures and standards to be included in the detailed design, construction and operation of the project necessary to moderate these environmental impacts and cumulative effects and reduce them to tolerable levels;
- To facilitate an informed, transparent and accountable decision-making process by engaging with the relevant authorities and private landowners.

Furthermore, mitigation measures and continuous monitoring programme will be described in the Draft of Environmental Management Plan (EMP).

THE ROLE OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Miss Hilya Amukwa is the Environmental Assessment Practitioner (EAP) undertaking the EIA and the responsible person completing this report. Miss Martha Haludilu, a policy analyst and information practitioner, assisting in the EIA with the due diligence on the environmental desktop studies, conducting economic, background, environmental, law and policies research on the project.

THE ROLE OF THE PROPONENT

The proponent will uphold and be bounded to the EMP for the duration of the project, the proponent will make sure that the status quo of health and safety of the workers is upheld and that there will be fairness within the project.

ADMINISTRATIVE AND LEGAL FRAMEWORK

The EIA is based on the requirements of the Namibian Environmental Management Act (Act. No. 7 of 2007), as well as supporting policies and guidelines, which include the environmental regulations of February 2012. An Environmental Clearance Certificate for mineral exploration activities is required and thus an EIA and Environmental Management Plan (EMP) needs to be submitted to the Ministry of Environment and Tourism (MET) of Namibia for approval. In agreement with the national legal framework, the following laws are relevant to the exploration program for base and rare metals, dimension stones, industrial minerals and precious metals groups of minerals on EPL 8759.

YEAR	LAW/ORDINANCE	APPLICABILITY
1990	The constitution of Namibia (1990) Article 95 (1)	✓ <i>Preservation of Namibia's Ecosystems, essential ecological process and biological diversity</i> ✓ <i>Sustainable use of Natural Resources</i>
2007	Labour Act No. 11 of 2007 & Rules and Regulations promulgated under the Act.	✓ <i>Safety and health requirements</i>
1998	Affirmative Action (Employment) Act No. 29 of 1998	✓ <i>Fair employment practice</i>
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation of 1995	✓ <i>Prescribes Environmental Impact Assessments for any developments with potential negative impacts on the Environment</i>
2013	Water Resources Management Act 11 of 2013	✓ <i>Effluent discharge permit required under section 70</i> ✓ <i>Water related pollution</i>

		<i>and abstraction</i>
2012	Environmental Management Act 7 of 2007 with Regulations of 2012	<ul style="list-style-type: none"> ✓ <i>Establishes Principles for EA</i> ✓ <i>Ensures that significant effects of activities are considered timorously and carefully</i> ✓ <i>Allows for opportunities for participation by I & APs throughout the assessment process</i>
1975	Nature Conservation Ordinance 4 of 1975 with amendments and special regulations	✓ <i>Protection of various species</i>
1996	Nature Conservation Amendment Act 5 of 1996	<ul style="list-style-type: none"> ✓ <i>To provide for an economically based system of sustainable management and utilization of game in communal areas</i>
1969	Soil Conservation Act No. 76 of 1969	<ul style="list-style-type: none"> ✓ <i>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</i>
1974	Hazardous Substance Ordinance 14 of 1974, and amendments	✓ <i>Pollution prevention</i>
1999	Draft Pollution and Waste Management Bill (1999)	✓ <i>Protection for particular species, resources or components of the environment</i>

2004	National Heritage Act 27 of 2004	✓ <i>Disturbance of archaeological or cultural sites</i>
1992	Minerals (Prospecting and Mining) Act 33 of 1992 and special regulations	✓ <i>Exploration and exploitation of mineral resources</i>

DESCRIPTION OF THE PROJECT

LOCATION

The EPL is located about 86.05 km north northeast of Arandis and about 70 km southwest of Usakos. It covers an area of 17782.2417 Ha and extends over the following Farms, namely; Twyfel, Vrede, Ootmoed, Schwarz Spitzkoppe, Oberwasser, Okambahe Reserve and Harmonie. Below is a figure showing the corner coordinates of the EPL 8759.

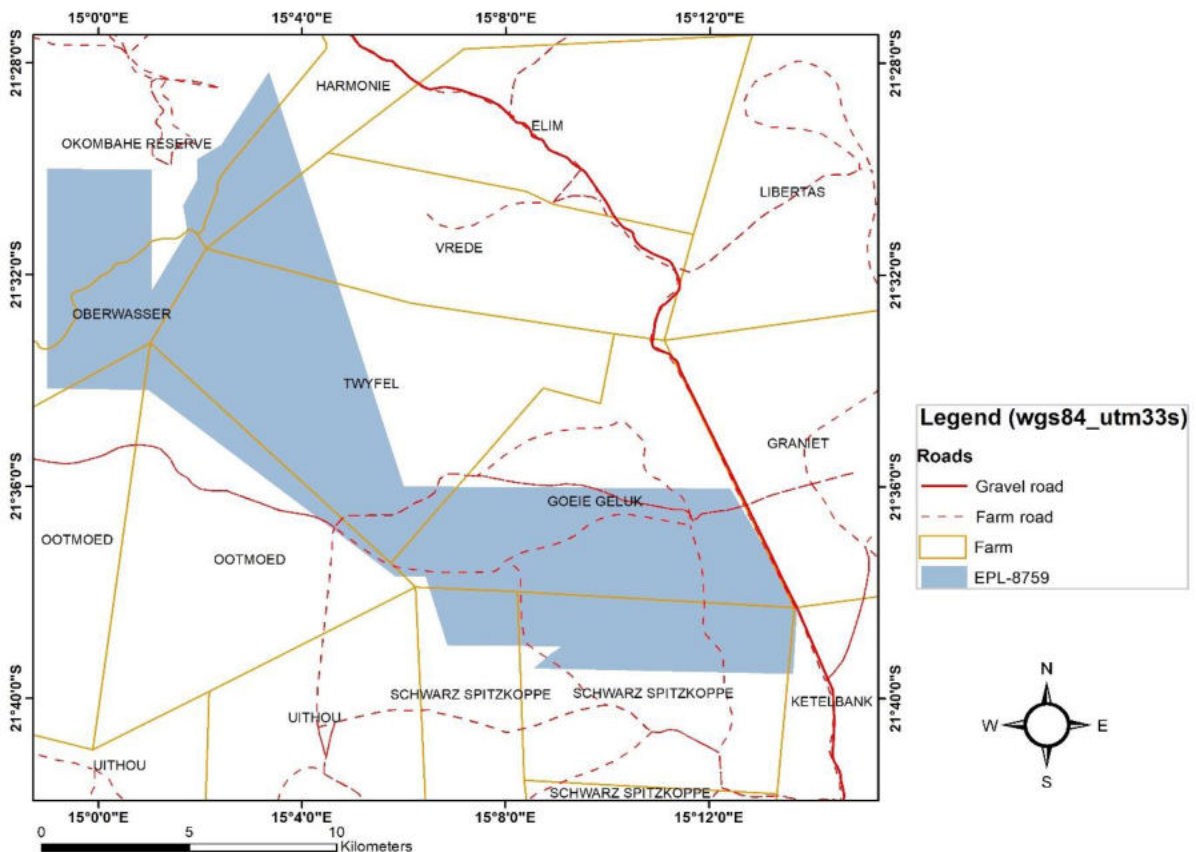


Figure 2 Farm Map

Order	Latitude		Longitude	
Part 1				
1	21° 39' 32.00"	S	15° 13' 39.00"	E
2	21° 39' 26.01"	S	15° 08' 33.47"	E
3	21° 39' 25.62"	S	15° 08' 33.47"	E
4	21° 39' 08.63"	S	15° 08' 54.54"	E
5	21° 39' 01.58"	S	15° 09' 05.43"	E
6	21° 39' 01.57"	S	15° 09' 03.29"	E
7	21° 39' 01.00"	S	15° 09' 04.00"	E
8	21° 39' 00.00"	S	15° 06' 52.00"	E
9	21° 38' 59.43"	S	15° 06' 51.37"	E
10	21° 37' 41.74"	S	15° 06' 25.84"	E
11	21° 37' 42.37"	S	15° 05' 50.75"	E
12	21° 34' 11.25"	S	15° 00' 59.63"	E
13	21° 34' 11.25"	S	15° 00' 58.34"	E
14	21° 34' 11.00"	S	15° 00' 58.00"	E
15	21° 34' 09.00"	S	14° 59' 00.00"	E
16	21° 30' 00.00"	S	14° 59' 00.00"	E
17	21° 30' 01.00"	S	15° 01' 03.00"	E
18	21° 32' 18.00"	S	15° 01' 03.00"	E
19	21° 31' 11.00"	S	15° 01' 45.00"	E
20	21° 30' 42.00"	S	15° 01' 40.00"	E

21	21° 30' S	15° 01' E
	12.00"	57.00"
22	21° 29' S	15° 01' E
	49.00"	57.00"
23	21° 29' S	15° 02' E
	33.00"	25.00"
24	21° 28' S	15° 03' E
	10.00"	21.00"
25	21° 36' S	15° 06' E
	00.00"	00.00"
26	21° 36' S	15° 12' E
	02.00"	25.00"
27	21° 38' S	15° 13' E
	14.00"	44.00"

Figure 3 Corner coordinates of EPL 8759

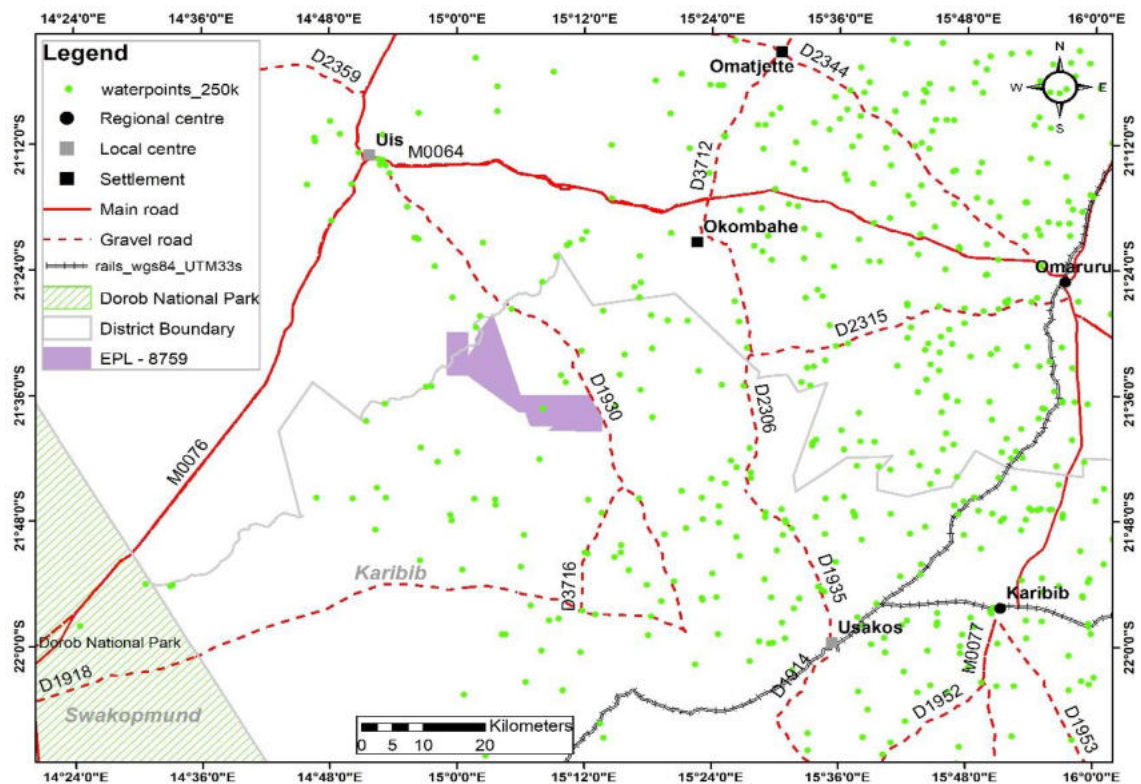


Figure 4 Locality map

The EPL can be accessible through the Spitzkoppe road through the D1930 gravel road route from the B2 road.

THE RECEIVING ENVIRONMENT

GEOLOGICAL SETTING

The geology of the EPL area is dominated by metamorphic rocks of Damara age. Marbles and mica schists of the Swakop Group underlie the EPL. They are exposed along the river course of the Omaruru River. In places, Damaran granites intrude the metamorphic. Outcrop of these intrusive occurs at several places within the EPL.

Flat lying areas are formed of calcretised gravel plains covering the rocks of the Swakop Group. Calcretised areas occur to the south and west of Klein Spitzkoppe and in the central parts of EPL 3851. The northern target on the EPL situated northwest of the Omaruru River probably represents an ancient river channel of the Omaruru River.

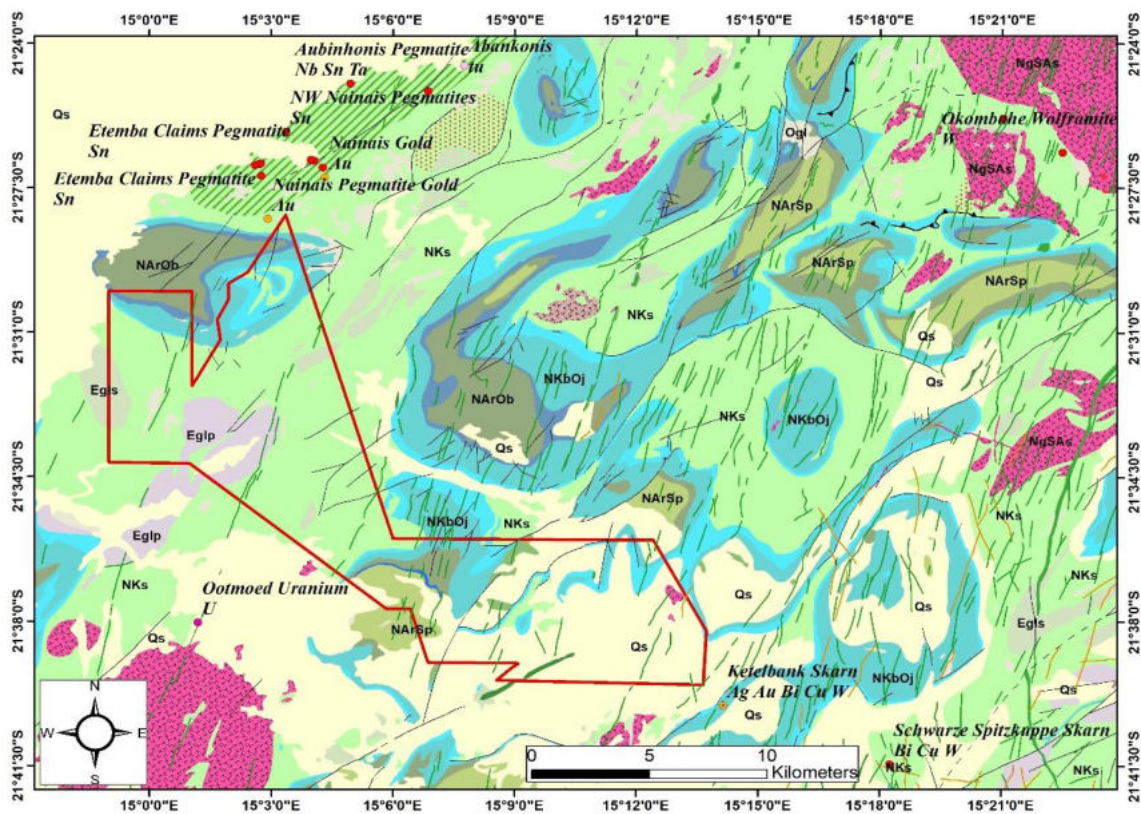


Figure 5 Geological map

ENVIRONMENTAL OVERVIEW

The information provided in this chapter is based on a literature survey of various sources. Wherever possible, these results were verified during the field visit.

Climate

Climate has a major influence on all aspects of life in Namibia. This applies to the availability of water, wind and temperature patterns, agricultural potential, life-stock farming, recent, historical and archaeological occurrences of settlements, as well as the distribution and abundance of wildlife and vegetation. As not otherwise stated the information given in this section is sourced from the Atlas of Namibia (Mendelsohn et al, 2002).

Precipitation

Rainfall in the EPL area is low and highly variable. According to available data, the average annual rainfall lies between 50-100mm/year in the west of EPL 3851 and 100 – 150mm/year for the east of the EPL area. Peak rain months are between January and March.

Unfortunately, no precise rainfall data could be obtained for the last two rainy seasons 2007/2008 and 2008/2009, which were exceptionally good. The intensity of the last rainy season was still obvious during the field visit as a dense grass cover was found in nearly all parts visited.

The western parts of the EPL area lies within the fog belt of the Namib Desert. Occasionally moist air from the coast is blown on-shore across the gravel plains to higher elevations where it will cool down and form fog. 25 – 50 days of fog/year can be expected for the EPL area.

Potential / actual impacts

- Dehydration of workforce especially during summer and east-wind conditions
- Sunburn risk
- Exposure in extreme cold and windy events

Wind

No detailed information for the EPL area regarding wind direction and intensity could be obtained at the present stage.

In central western Namibia, winds are predominately from the south and west for most times of the year. During the winter months high-pressure systems over the interior of southern Africa because strong north-easterly winds, so-called Berg winds. In this area, winds are

blowing overnight from South, in the morning from Southeast and during the afternoon from Southwest. At daytime, a moderate breeze of approximately (20 to 29 km/h) is always expected. Whilst gusts up to 55 km/h are possible.

Rainfall and Temperature

Namibia lies within in tropics and is thus regarded a hot country. However, temperatures vary during the day, seasonally and geographically. The closer an area is situated to the coast, temperature extremes are moderated by the presence of the cold offshore current. As the EPL area is under climatic coastal influence during most times of the year, minimum temperatures below freezing are seldom recorded. Average minimum temperatures are expected to be between 10 – 12°C, average maximum temperatures range between 30 – 32°C. However, during east-wind conditions (Berg wind, see below) temperatures can rise up to 40°C. The coldest month is August; hottest temperatures are reached in February. In general, seasonal temperature variances are not extreme, due to the effect of the cold ocean current. Spitzkoppe enjoys a hot desert climate in accordance with the Köppen-Geiger classification. The yearly average maximum temperature in Spitzkoppe is 29°C (ranging from 24°C in July to 33°C in October). Annual rainfall is 663mm, with a minimum of 0mm in July and a maximum of 197mm in February. The climate in the area is arid with a west-east gradient of average mean rainfall of 50-100 mm. Temperatures are high in summer (mean daily maximum for hottest month: 31-32°C) and moderate in winter (mean daily maximum for coldest month 9-10°C). In general zonal vegetation in this area has been described as “central Namib”, “grass zone” and “tral Namib”, “grass zone” and “Euphorbia damarana and “dwarf and Acacia shrubland of central west”.

Topography and Drainage

The landscape is classified as being in Spitzkoppe, which is dominated by limestone with little or no surface run-off, strong development of sinkholes, dolines and caves. The EPL8759 is partially located within the catchment of the Omatako River (Figure 3), an ephemeral river catchment flowing in a north easterly direction and EPL8759 is located north of the headwaters of the Daneib river catchment (Figure 4). Surface drainage appears to be poorly developed within EPL8759 where rivers are poorly developed. The satellite imagery (Figure 2) reveals the presence of parallel dunes running east west within the eastern part of EPL8759. These dunes have subsequently been covered with vegetation.



Figure 6 showing a drainage area close to the EPL 8759

BIOLOCAL ENVIRONMENT

Flora and Fauna

The EPL area falls within the western-central Escarpment and Inselberg biome. The vegetation structure is described as sparse shrub land (Mendelsohn et al, 2002). Both target areas on the gravel plains are covered by various grass species. Shrubs only occur within small drainage lines. The main shrub types observed in the drainage lines are *Boscia foetida*, *Acacia sp.*, *Parkinsonia africana* and *Salvadora persica*.

In contrast to the poorly vegetated gravel plains, the riverbed of the Omaruru shows a variety of larger trees (Plate 8). As typical, for ephemeral river courses of western Namibia the following tree species were observed: *Acacia erioloba*, *Faidherbia albida*, *Salvadora persica*, *Parkinsonia africana*. Rocky outcrops within the EPL areas are additionally vegetated by *Euphorbia damarana*, *Euphorbia virosa*, *Commifora sp.* and occasionally *Boscia albitrunca*. Invasive *Prosopis sp.* occur at many places in the EPL area. (Please note: the list of shrubs and trees is not complete and only names the most common species observed) as provided in figure 7 below.



Figure 7 *Euphorbia Virosa*



Wolfsmilch

SOCIO-ECONOMIC ENVIRONMENT

The land use is mainly for subsistence farming where in some cases the owners of the property live on the farms with their families and the employees too may have family members staying on the farm with them. From time to time, the farm owners may travel to nearby towns for access to food, fuel and medical services. The figure below renders a map of the farms within the EPL.

Livelihood

The Spitzkoppe Community (About 1 200 people live in the area) has since lived in the area. The Spitzkoppe area has spectacular natural resources and boasts some of Namibia's most unique sceneries and biodiversity, but at the same time, it is also a very sensitive environment under pressure from the number of visitors to the area and natural resource use. Schools face a lack of teaching materials and limited resources to offer the pupils the education needed. The people live in an area with very limited water resources. Water scarcity places a constraint on community income generation and development opportunities. The existing water resources are over exploited and to ensure future water security, the community has to take sustainable water management into consideration in their daily lives and business ventures, including tourism.

Heritage and Archaeology

An archaeological impact assessment was carried out for the proponent focusing on the proposed exploration activities on EPL 8759 near the Klein Spitzkoppe Mountain in the Erongo region. The assessment therefore reviewed the archaeological records, historical documents from the previous studies surrounding the area, interview with locals and a field survey as a basis of inference to conclude that damage or disturb sites or materials protected under the

National Heritage Act (27 of 2004) is unlikely to occur. However, due to the possibility that buried archaeological remains could become known in the course of construction work the client is advised to adopt the Chance Finds Procedure. See appendix c for heritage and archaeology consent letter and report.

Economy

Income is generated through small-stock farming, the informal sector and tourism, small mining of semi-precious stones and craft manufacturing sold to tourists. Spitzkoppe has limited land suitable for agriculture because of a lack of water. As a result, the existing land suited for grazing has been overgrazed.

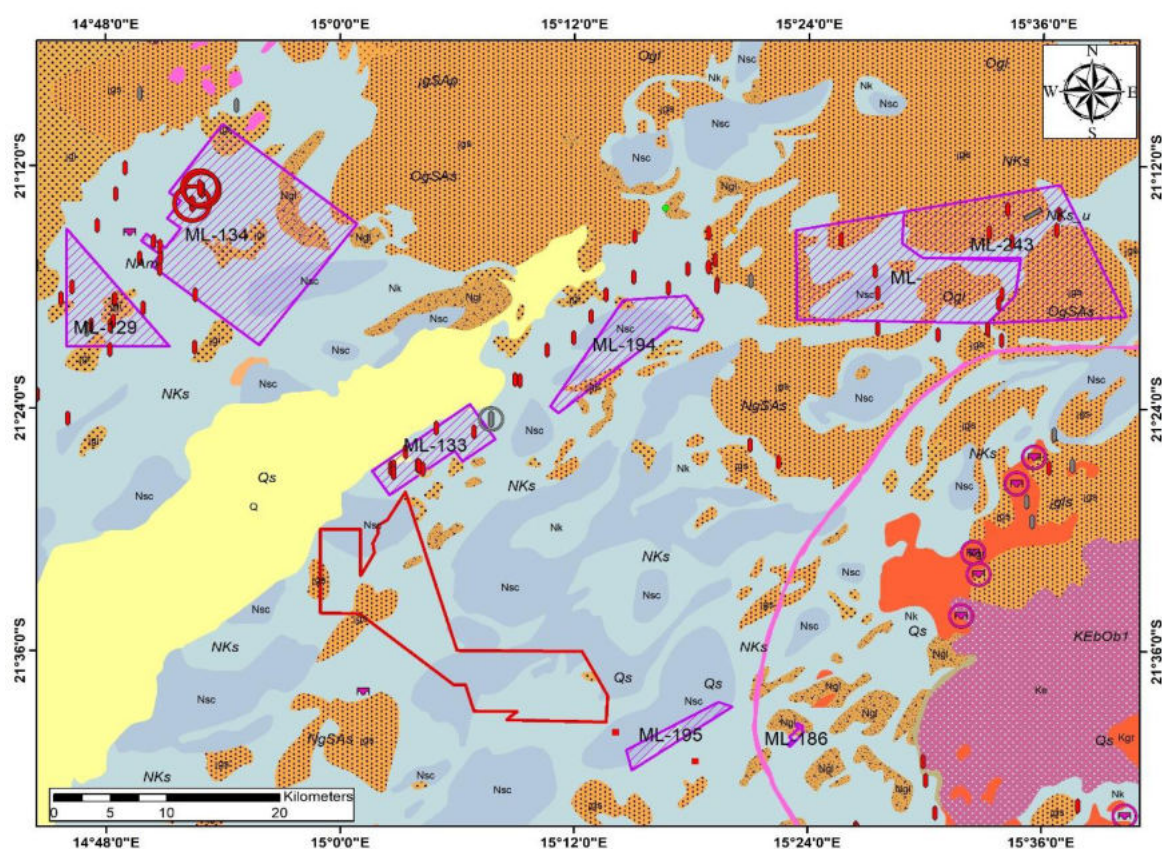


Figure 8 Economic map

See Appendix

Condition of housing in the area

As seen in the figure below the houses in the area are not in the best of conditions, they are bricked walled and falling apart in some places, but the farmers try to find a way to manage and fix the damages. The houses are well fenced of and are somehow secured.



Figure 9 Farmhouses cutting within the EPL 8759 area

PROJECT DESCRIPTION

Exploration follows three phases as described below. Firstly, there is a prospecting phase, then a drilling phase and lastly a pitting, trenching, bulk sampling and trial mining phase. Kunene Resources (Pty) Ltd plans to conduct a staged exploration approach as follows.

PROSPECTING

Aerial data is ascertained from existing maps and reports. In addition to this, the proponent plans to undertake remote sensing using an airborne electromagnetic survey. This consists of flying low over the terrain in a small dust cropper like aircraft using sophisticated equipment to survey the electromagnetic anomalies in the ground below. The outcomes of this survey and the desktop research must then be verified through fieldwork. Therefore, up to this point no physical disturbance is required.

Lithological (soil/rock) mapping, sampling and analysis will be necessary to verify the desktop and aerial survey work. The results from this initial lithological mapping may need further confirmation by means of small exploration pits as well.

Prospecting is in general a low intensity activity. Specifically, it constitutes the following:

- ✓ A prospector (Geologists and geo-technicians) walking through the area with a rock hammer and GPS examining and mapping the outcropped lithology.
- ✓ Collecting rock and sand samples by hand for either mineral or chemical analysis.
- ✓ Possible follow up pitting.
- ✓ It is estimated that a maximum of 6 persons would be needed for these field aspects

For the first 12 months, prospecting will be done by:

- ✓ Data collection and compilation of all available information into GIS digital format and interpretation of data (2 months)
- ✓ Mapping of the area & prospect pitting (2 months)
- ✓ Analysis of samples (4 months)
- ✓ Compilation of data and preliminary viability calculations (5 months)

For the remaining 24 months of the initial license tenement prospecting will be done by the following activities:

- ✓ The identification of potential mineral occurrences of base and rare metals, precious metals through additional remote sensing techniques.
- ✓ The identification of potential secondary mineral resources of economic interest. The area will also be looked at in the light of secondary mineralisation as well as for different types of mineral deposits.

EXPLORATION DRILLING, SAMPLE EXTRACTION AND ANALYSIS

This phase of exploration may begin in the first licence period or the subsequent licence periods. The most commonly used drilling techniques are Reverse Circulation Drilling (RC). This method is applied in exploration, resource evaluation and subsequently in defining an ore reserve.

RC Drilling uses a pneumatic hammer which drives a rotating tungsten-steel bit. The technique produces an uncontaminated large volume sample which is comprised of rock chips.

The target areas within the EIA which have been identified during the prospecting phase will then undergo exploration drilling to obtain undisturbed samples of the lithology which are associated with the specific minerals present. A number of consecutive drilling campaigns on increasingly closer-spaced exploration grids might be conducted. Drilling is initially done with the diamond coring technique. Once the type of ore body is understood, emphasis then lies on obtaining more closed-spaced samples for gaining confidence and information on the statistical variance. For this latter process, RC Drilling is the preferred technique.

If there are signs of specific target minerals present, then prospecting activities progress to more detailed work program. Drilling is then required to go deeper. Larger samples are geologically logged and analysed in a laboratory.

Exploration will take place during the daytime only and staff will either commute to site from the town or there would be an establishment of a drilling camp at an approved site within the EPL. Camp sites will be established in consultation with the local farm owners and be run according to strict conditions for control of litter and other disturbances.

Access will be organised along the existing roads as far as possible. Tracks for new access roads will be assessed for any environmental sensitivity. Solid waste will be removed off site and taken to Spitzkoppe approved landfill site. Ablution facilities will use chemical toilets and or sealed septic tanks and the sewerage taken to the Spitzkoppe sewerage plant periodically. No power supply infrastructure to the site is planned. Diesel power generation will be used. Temporary storage areas for drilling materials, machines etc. will be necessary at the camp. Security will be supplied on a 24-hour basis at the exploration camp. A fence surrounding the camp will be constructed to ensure people and domestic animals are not put at risk. These support services and facilities will be removed at the end of the 3rd phase of the exploration. An exploration team of 35 persons (4 drilling teams plus geologists and technicians) could potentially be required depending on the outcomes of the prospecting phase and the intensity of drilling requirements to meet the demands of market and investors.

Clearing of vegetation at the planned drill sites may be necessary and larger trees will be retained so that the bush can restore itself. Permits from the forestry directorate will be required for this purpose. Where necessary, stockpiling of top soil for rehabilitation at a later stage will be undertaken. Necessary landscaping of exploration areas will be undertaken upon completion of each phase of exploration.

PITTING, TRENCHING, BULK SAMPLING AND TRIAL MINING

In the advanced stage of exploration activities, larger amounts of sample material, whether a main mineral being targeted, or the secondary mineralisation target may be required for the performing processing trials and metallurgical testing programs. The ground conditions and geotechnical parameters would then be established with a view to extract the mineral from the ore reserve.

Bulk sampling for analytical processing will only be carried out if the material obtained during drilling is insufficient. Pits may be dug / excavated to a depth of 4m and 5 cubic meters of samples are taken. The location of the pits will depend on the drilling results. The size of the sample may be adjusted depending on the nature of the mineralisation observed from drilling. The pits and bulk sampling sites are determined from the results of the drilling and will most likely be where drilling had already taken place. A trench may span between drilling sites, thereby incurring additional disturbance.

The proponent plans to employ several people for the exploration phases. Initially, the exploration team doing field work would consist of a handful of geological personnel. During the drilling phase the exploration team will increase in numbers. For one RC rig the team consists of 4 members plus a driver. Each drill rig will have one foreman and one geologist assigned to it. The camp will have one chef and a camp manager. So, for a very intensive drilling programme, 3 RC will be needed. The total personnel number would be no more than 35 for this configuration. At this stage it is not clear how many rigs will be mobilised. During exploration, only temporary accommodation will be established within the respective EPL area.

STAKEHOLDER CONSULTATION

In terms of Section 7 of the Environmental Assessment Regulations (2012), this section provides details of Public Participation Process (PPP) undertaken in the compilation of this EIA scoping report.

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

This background information document (BID) see Appendix B provided IAPs with the opportunity to register and engage in the public participation process. Through registering, they have the opportunity to:

- ✓ Provide the EIA coordinator with additional information which should be taken into account in the assessment of impacts and during decision-making;
- ✓ Attend meetings and obtain information about the proposed project;
- ✓ Share any comments, issues or concerns related to the proposed exploration activities;
- ✓ Review and comment on the draft report and EMP and findings from the EIA process.

Aim for Public Participation Process (PPP)

The aim for the Public Participation Process is not limited to:

- ✓ Informing Interested and Affected Parties (I&APs) of the proposed project;
- ✓ Identifying issues, comments and concerns as raised by I&APs;
- ✓ Promoting transparency and an understanding of the project and its consequences;
- ✓ Serving as a structure for links and communication with I&APs; and
- ✓ Providing local knowledge and input in identifying potential environmental (biophysical and social) impacts and “hotspots” associated with the proposed development.

The Ministry of Environment and Tourism defines the Environmental Assessment Regulations (2012) of the Environmental Management Act (2007), as a process in which potential interested and affected parties such as neighbouring landowners, local authorities, environmental groups, village councils and communities, to comment on the potential environmental impacts associated with the proposed project. Besides these legal requirements, the consultation of the public and other relevant stakeholders was undertaken to ensure that their voices are heard and taken into account during the decision-making process.

Advertisement and site notices

The public participation notices for the EIA were advertised over two consecutive weeks in The Namibian Newspaper on **the**. Furthermore, EIA notices were placed in Karibib, Usakos, Gaingu Conservancy, and Spitzkoppe.

Public Meeting held on Site

In compliance with the EIA Regulations (2012), public (I&AP) and all stakeholders were notified as a requirement for EIA process. Therefore, to incorporate the varying needs of stakeholders and I&APs, as well as to ensure the relevant interactions between stakeholders and the EIA specialist team, the public was invited to the public meeting at the Spitzkoppe Community hall ,– as per the itinerary below:

Venue	Date	Time
Spitzkoppe community hall	27 August 2022	10:00AM - 12:00PM

Despite advertising the public meeting in the newspaper and their local radio, no one showed up for the meeting but the headman of the community and the secretary to the headman, we then proceeded to go view the site with the headman and got a chance to talk to some of the farm owners that the EPL falls under. The public interest on this project is minimal.



Figure 10 Site meeting with the headman

IMPACT ASSESSMENT

The purpose of this section is to assess and identify the most pertinent environmental impacts by describing certain quantifiable aspects of these impacts and to provide possible mitigation

measures to minimize the magnitude of the impacts that would be expected from the various activities that constitute the proposed minerals exploration in EPLs 8759.

The following potential impacts on the environment during exploration activities have been identified:

- ✓ Dust
- ✓ Noise
- ✓ Health & Safety
- ✓ Visual
- ✓ Land Use
- ✓ Waste
- ✓ Ecological
- ✓ Groundwater and surface water
- ✓ Heritage
- ✓ Socio-Economic

These identified potential impacts have been evaluated. Mitigation measures are proposed for each aspect of the different potential impacts identified. Comments and concerns raised during the public consultation process have been considered and included.

Assessment methodology for evaluating potential impacts

Risk Event	Description of the risk that may lead to an impact.
Status (+ or -)	<p>Positive - environment overall will benefit from the impact</p> <p>Negative - environment overall will be adversely affected by the impact</p> <p>Neutral - environment overall will not be affected</p>
Extent	<p>Site Specific Local (limited to within 15 km of the area)</p> <p>Regional (limited to ~100 km radius)</p>

	<p>National (limited to within the borders of Namibia)</p> <p>International (extending beyond Namibia's borders)</p>
Duration	<p>Very Short (days, <3 days)</p> <p>Short (days, 3 days - 1 year)</p> <p>Medium (months, 1 - 5 year)</p> <p>Long (years, 5 - 20 years)</p> <p>Permanent (>20 years)</p>
Intensity	<p>No Lasting effect (No environmental functions and processes are affected)</p> <p>Minor effects (The environment functions, but in a modified manner)</p> <p>Moderate effects (Environmental functions and processes are altered to such extent that they temporarily cease)</p> <p>Serious effects (where environmental functions and processes are altered such that they permanently cease and/or exceed legal standards/requirements)</p>

Probability	<p>Refers to the probability that a specific impact will happen following a risk event.</p> <p>Improbable (low likelihood)</p> <p>Probable (distinct possibility) Highly probable (most likely)</p> <p>Definite (impact will occur regardless of prevention measures)</p>
Prevention	Measures to reduce the probability of an impact occurring.
Significance (no mitigation)	None (A concern or potential impact that, upon evaluation, is found to have no significant impact at all.)
	<p>Low (Any magnitude, impacts will be localized and temporary. Accordingly, the impact is not expected to require amendment to the project design.)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation.)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable)</p>
Mitigation	Description of possible mitigation measures

Significance (with mitigation)	<p>None (A concern or potential impact that, upon evaluation, is found to have no significant impact at all.)</p> <p>Low (Any magnitude, impacts will be localized and temporary. Accordingly, the impact is not expected to require amendment to the project design.)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation.)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable.)</p>
Confidence Level	<p>The degree of confidence in the predictions, based on the availability of information and specialist knowledge.</p> <p>Low (based on the availability of specialist knowledge and other information)</p> <p>Medium (based on the availability of specialist knowledge and other information)</p>
	<p>High (based on the availability of specialist knowledge and other information)</p>

Risk Event	Description of the risk that may lead to an impact.
------------	---

<p>Status (+ or -)</p>	<p>Positive - environment overall will benefit from the impact</p> <p>Negative - environment overall will be adversely affected by the impact</p> <p>Neutral - environment overall will not be affected</p>
<p>Extent</p>	<p>Site Specific</p> <p>Local (limited to within 15 km of the area)</p> <p>Regional (limited to ~100 km radius)</p> <p>National (limited to within the borders of Namibia)</p>
<p>Duration</p>	<p>Very Short (days, 3 days)</p> <p>Short (days, 3 days -1 year)</p> <p>Medium (months, 1 - 5 year)</p> <p>Long (years, 5 - 20 years)</p> <p>Permanent (>20 years)</p>
<p>Intensity</p>	<p>No lasting effect (No environmental functions and processes are affected)</p> <p>Minor effects (The environment functions, but in a modified manner)</p>

	<p>Moderate effects (Environmental functions and processes are altered to such extent that they temporarily cease)</p> <p>Serious effects (where environmental functions and processes are altered such that they permanently cease and/or exceed legal standards/requirements)</p>
Probability	<p>Refers to the probability that a specific impact will happen following a risk event.</p> <p>Improbable (low likelihood)</p> <p>Probable (distinct possibility)</p> <p>Highly probable (most likely)</p> <p>Definite (impact will occur regardless of prevention measures)</p>
Prevention	<p>Measures to reduce the probability of an impact occurring.</p>
Mitigation	<p>Low (Any magnitude, impacts will be localized and temporary. Accordingly, the impact is not expected to require amendment to the project design.)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation.)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable) Description of possible mitigation measures</p>

Significance (with mitigation)	<p>None (A concern or potential impact that, upon evaluation, is found to have no significant impact at all.)</p> <p>Low (Any magnitude, impacts will be localized and temporary. Accordingly, the impact is not expected to require amendment to the project design.)</p> <p>Medium (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation.)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a ‘no go’ implication for the project unless mitigation or re-design is practically achievable.)</p>
Confidence Level	<p>The degree of confidence in the predictions, based on the availability of information and specialist knowledge.</p> <p>Low (based on the availability of specialist knowledge and other information)</p> <p>Medium (based on the availability of specialist knowledge and other information)</p> <p>High (based on the availability of specialist knowledge and other information)</p>

Dust Impact

Risk Event	Disturbances to soil and rock resulting in excessive dust in the atmosphere
Nature of Impact	Prospecting work is likely to create minimal dust. Drilling using reverse circulation or

	<p>impact drilling is very likely to create dust due to the nature of the technique. The generated dust impacts on personnel working in close proximity to the drilling rig. Impacts on the photo-transpiration efficiency of the surrounding plants can be hampered. The dusty plants are less palatable to grazing or browsing animals.</p>
Status	Negative
Extent	<p>Site Specific and possibly local depending on mobility of particles and prevailing weather conditions. Only on very windy days would visually impacting dust travel further than 15km. The source does not move unlike with trucks on dirt roads, so the impact is along a single vector.</p>
Duration	Project duration specific
Intensity	<p>Moderate effect in a radius of 150m. No known hazardous status of the substrate is expected</p>
Probability	Probable
Significance (no mitigation)	<p>Medium to Low. Natural weather conditions can create very dusty atmospheric conditions. The small scale and site-specific exploration activities contribute very little to the widespread ambient conditions that often prevail. Cars travelling on the access roads can create dust plumes trailing behind them. Exploration activities entail driving or walking to particular sites to collect samples. The impact is not persistent for the long term.</p>

Mitigation	<p>Dust suppression techniques should be employed if the specific exploration activity is likely to create dusty atmospheric conditions in excess of the periodic extremes.</p> <ol style="list-style-type: none"> 1. Avoid activities that create excessive dust on extremely windy days. 2. Personnel are required to wear personal protection equipment if excessive dust is created for prolonged working periods.
Significance (with mitigation)	Low
Confidence Level	High

Noise Impacts

Risk Event	Disturbance of sense of place and the effect on tranquil ambient noise levels
Nature of Impact	<p>Potential noise sources during the exploration within EPL 8759 could originate from vehicles, blasting (when taking bulk samples), hammers, powered hand tools, excavators and drill rigs. The nuisance factor of these noise sources will depend on the proximity of the exploration activities to the national road, homesteads and sensitive animal habitats. Other vehicles travelling on the road contribute to the ambient noise levels.</p>
Status (+ or -)	Negative
Extent	Site specific and Localized (up to 1km depending on the weather conditions)
Duration	Short

Intensity	Minor Effects (i.e. cumulative when near the national road) & Moderate Effects in quieter locations of farms, lodges and hunting establishments.
Probability	Definite
Prevention	Noise creation cannot be prevented completely and will occur and should be mitigated as best as possible.
Significance (no mitigation)	Medium
Mitigation	<p>For rural districts the daytime ambient noise level requirement outlined in SANS 10103 (2008) between 6am and 10pm is 45dBA. This is in line with the guidelines published by the World Health Organization (WHO). There are industry standards to which the noise sources (i.e. machinery) must comply. Regular maintenance of machinery should maintain the acceptable noise levels for operators working with the machines. The activities are to take place during daylight hours only. Periods of silence during the day may be necessary.</p> <p>The guidelines and PPE mitigations are discussed under the health and safety section.</p> <p>Arrangements to drill over the weekends or at other times need to be made with landowners so that there is no conflict with tourist, hunting or domestic activities. It is recommended that any complaints regarding noise be recorded in the bi-annual reports.</p>
Significance (with mitigation)	Low

Confidence Level	High
------------------	-------------

Health & Safety Impacts

Nature of Impact	<p>Noise:</p> <p>Long-term exposure to high levels of noise can cause permanent hearing loss. Neither surgery nor a hearing aid can help correct this type of hearing loss.</p> <p>Short-term exposure to loud noise can also cause a temporary change in hearing (your ears may feel stuffed-up) or ringing in your ears (tinnitus). These short-term problems may go away within a few minutes or hours after leaving the noisy area.</p> <p>Vibration:</p> <p>Different vibration types are defined as:</p> <p><i>Hand-Arm Vibration</i> is defined as mechanical vibration that, when transmitted to the human hand-arm system, entails risks to the health and safety of workers, vascular, bone or joint, neurological or muscular disorders.</p> <p><i>Whole-Body Vibration</i> is defined as the mechanical vibration that, when transmitted to the whole body, entails risks to the health and safety of workers lower back morbidity and trauma to the spine.</p>
Status	Negative

Extent	Site Specific
Duration	Short but continuous exposure to high noise levels may lead to permanent hearing loss
Intensity	Moderate to Serious Effects
Probability	Probable
Prevention	<p>Engineering controls that reduce sound exposure levels are available and technologically feasible for most noise sources. Engineering controls involve modifying or replacing equipment or making related physical changes at the noise source or along the transmission path to reduce the noise level at the worker's ear. The same goes for vibration.</p> <p>Choose low-noise tools and machinery.</p> <p>Maintain and lubricate machinery and equipment (e.g. oil bearings).</p> <p>Place a barrier between the noise source and employee (e.g., sound walls or curtains).</p> <p>Enclose or isolate the noise source.</p>
Significance (no mitigation)	High
Mitigation	<p>Noise:</p> <p>OSHA sets legal limits on noise exposure in the workplace. These limits are based on a worker's time weighted average over an 8-hour day. With noise, OSHA's permissible exposure limit (PEL) is 90dBA for all workers for an 8-hour day. The</p>

	<p>OSHA standard uses a 5dBA exchange rate. This means that when the noise level is increased by 5dBA, the amount of time a person can be exposed to a certain noise level to receive the same dose is cut in half.</p> <p>The WHO guideline on maximum noise levels to prevent hearing impairment set noise level limits at an average of 70 dBA over a 24-hour period with maximum noise levels not exceeding 110 dBA during the period. These latter limits would apply if the daytime shift is prolonged beyond the 8-hour day.</p> <p>Mitigation include:</p> <p>Operating noisy machines during shifts when fewer people are exposed. Limiting the amount of time, a person spends at a noise source.</p> <p>Providing quiet areas where workers can gain relief from noise sources</p> <p>Where possible, restricting worker presence to a suitable distance away from noisy equipment. (Controlling noise exposure through distance is often an effective, yet simple and inexpensive administrative control.)</p> <p>In open space, for every doubling of the distance between the source of noise and the worker, the noise is decreased by 6dBA.</p> <p>Hearing protection devices, such as earmuffs and plugs, are considered an acceptable, but less desirable option to</p>
--	---

	<p>control exposures to noise.</p> <p>Vibration:</p> <p>Industry vibration regulations set daily exposure limit values and action values for both hand-arm and whole-body vibration for eight hour shifts. Personnel can work shorter shifts where conditions exist causing excessive vibration.</p>
Significance (with mitigation)	Low
Confidence Level	High

Health and Safety Impacts

Risk Event	Injury risks due to normal working conditions
Nature of Impact	<p>The potential impacts on human health and safety resulting from exploration activities could include occupational accidents and injuries, vehicle accidents, exposure to weather extremes, trips and fall on uneven terrain, adverse health effects from dust generation and emissions, and contact with hazardous materials. The potential for these impacts to occur would be low because of the limited range of activities and number of workers required during exploration. Kunene Resources follows a set of industry-specific safety and health policies on the workplace.</p> <p>Operational procedures during tanker ship offloading pose numerous risks to operational personnel. These risks are</p>

	<p>assessed in terms of the predicted impact if realized. Typical examples are:</p> <ul style="list-style-type: none"> • Carcinogenic effects of some petroleum products • Breathing in excessive fumes • Product contact with eyes and skin • Slipping on wet surfaces • Working at heights • Muscular injury from incorrect lifting techniques
Status (+ or -)	Negative
Extent	Site Specific
Duration	Permanent
Intensity	Minor to Serious Effects
Probability	Highly probable
Prevention	<p>The operations of the exploration can cause serious health and safety risks to workers on site. Occupational exposures are normally related to dermal contact with fuels and inhalation of fuel vapors during handling of such products. For this reason, adequate measures must be brought in place to ensure safety of staff on site.</p> <p>An integrated health and safety management system acts as a monitoring tool and mitigating tool. The monitoring tools are elaborated upon in the EMP.</p> <p>Typical mitigating measures within the health and safety management systems are:-</p>

	<ul style="list-style-type: none"> ▶ Operational and procedural manuals ▶ Health and safety training ▶ Housekeeping rules ▶ Colour coding areas, pipes, equipment and substances ▶ Signage for personal protective equipment (e.g. protective clothing like safety boots and hard hats) ▶ Safe working procedures and permits to work ▶ Emergency response plans ▶ Material Safety Data Sheets (MSDS) ▶ First aid treatment and training ▶ Medical procedures and emergency services ▶ Daily safety reminders and/or drills ▶ Regulations for handling fuel <p>The MSDS gives health related medical responses for personnel assisting staff who are exposed to the fuels.</p>
Significance (no mitigation)	Medium
Mitigation	<p>Procedures for dealing with injuries or accidents must be in place and all contact details for emergency personnel available. The company safety manual is used as developed by the guidelines and statutory requirements under the Labour Act.</p>
Significance (with mitigation)	Low

Confidence Level	High

Visual Impacts

Risk Event	Changes to the aesthetic appeal of the area due to presence of people, vehicles and machinery. Visible changes to habitats due to human activities.
Nature of Impact	The experience of enjoying the vista unobstructed by human activities is considered highly desirable. Impact to visual resources would be considered adverse if the landscape were substantially degraded or modified. Exploration activities will only have temporary and minor visual effects, resulting from the presence of workers, vehicles and other equipment. Exploration activities would possibly contribute to this to some degree through drill pad and road construction. Prospecting phase activities would have negligible effect on this aspect.
Status	Negative
Extent	Localised
Duration	Short (presence of vehicles, personnel and machinery) Long (un-rehabilitated prospecting holes or pits)
Intensity	Moderate Effects
Probability	Definite
Prevention	For exploration to take place, personnel, vehicles and machinery will be deployed into the area for the short term periodically. Exploration is not possible without disturbing small sections of the various habitats.
Significance (no mitigation)	High

<p>Mitigation</p>	<p>Best practice methodologies for exploration will be employed. They may include the following: (Some of these also apply to mitigations for ecological impacts as well) As far as is possible existing roads and tracks are used to access target sites for sampling and drilling.</p> <p>Walking to target sites being careful not to disturb plants and faunal habitats.</p> <p>Personnel to be trained regarding the observable signs of faunal and floral biodiversity and the avoidance of habitat disturbance.</p> <p>Minimize the footprint of personnel, vehicles and machinery. As far as is possible no vegetation is to be removed. Where new roads are constructed the methods should be low intensive and possibly use manpower and not machines. New roads if planned well could assist with the future objectives of the farm, lodge or hunting establishment.</p> <p>Rehabilitate habitats through the removal of obvious signs of human presence. Remove all waste daily and dispose of it in the appropriate manner.</p> <p>Removal of machinery from the exploration sites if periods of inactivity are protracted.</p> <p>Drilling and subsequent phases should take place during the least busy tourism period as a measure to circumvent the negative publicity</p>
<p>Significance (with mitigation)</p>	<p>Medium</p>
<p>Confidence Level</p>	<p>Medium. Often, the sites that are disturbed and rehabilitated at least from an aesthetic perspective will in time be recolonized by both plants and animals. The aim is to minimize the footprint so as to achieve the</p>

	<p>least impact due to anthropogenic influences.</p> <p>There is no way to predict that changing the drilling period to less busy tourist times, that tourists, even if fewer in number, will not publish negative publicity.</p>

Land use Impact

Risk Event	Users and owners of the land could potentially experience restrictions to their constitutionally entitled liberties.
Nature of Impact	<p>EPL 8759 lies within state owned land and privately-owned land consisting of farms which are privately owned.</p> <p>Sometimes mineral exploration within the farming area is believed to be in opposition to the commercial, societal and biodiversity objectives of farming and natural environments.</p> <p>A Potential win-win scenario could be sustainable for the farms and mining providing for future generations. The value that mineral exploration and later still possible mining could bring to the district needs to be discussed between the company and the landowners.</p>
Status	Negative
Extent	Regional
Duration	Short (non-tourism/nature reserve farms within the EPL) Long (tourism-based farms within the EPL)
Intensity	Minor Effects (non-tourism/nature reserve-based farms) Serious Effects (for tourism-based farms)
Probability	Definite
Prevention	Exploration implies the presence of an exploration

	<p>team. The exploration activities would take place within sensitive nature reserve or tourist-based areas. Thus, it would not be possible to avoid the conflict of land use completely.</p>
Significance (no mitigation)	<p>High. The mineral exploration phase activities may impinge on the rights of the farmers or lodge owners.</p>
Mitigation	<p>Law requires that permission be provided through the issuing of an environmental clearance certificate for this listed activity. The EIA process facilitates a transparent process by which concerns can be raised. Common decency will direct the proponent to inform all stakeholders of the starting date for the activities once a positive record of decision has been issued by the government. The proponent (company) is subservient to the conditions laid down by the clearance certificate and the law that upholds it. The implementation of the exploration program will be in accordance with the approved Environmental Management Plan (EMP). The draft EMP can be found in Appendix.</p>
Significance (with mitigation)	<p>Medium to Low (the EMP must be strictly implemented and all efforts are made to reduce the impacts on the biodiversity, commercial and social aspects of the farmers)</p>
Confidence Level	<p>Medium</p> <p>The Ministry of Environment & Tourism may need to clarify and justify any grounds for which the exploration company will not be able to undertake exploration activities within the EPL areas.</p>

Waste Impact

Risk Event	Waste Production
Nature of Impact	The ability of a substance to be waste which must be cleaned up and or removed. Most of the waste produced will result from maintenance work performed on the machinery. Spilled product is also regarded as waste. Packaging from food products is included.
Status (+ or -)	Negative
Extent	Site Specific
Duration	Short
Intensity	Minor Effects
Probability	Definite
Prevention	Spillage prevention is possible through employing trained personnel and implementing general maintenance and upkeep of equipment.
Significance (no mitigation)	Medium
Mitigation	<p>Spills and leaks must be reported and cleaned up without delay.</p> <p>Workers will be made aware of their isolated living conditions, any goods for private use or for the business need to be brought a long way to the site and any waste generated also must be taken a long distance to the next dumping site. Therefore, avoidance of waste generation and recycling of all applicable materials are to be actioned daily.</p>

	Sewerage waste is to be removed from site. The department of water affairs have provided guidelines for the establishment of septic tanks.
Significance (with mitigation)	Low
Confidence Level	High

Ecological Impacts

Risk Event	Exploration activities may affect biodiversity of fauna and flora directly or through habitat alteration.
Nature of Impact	<p>Through the exploration for mineral resources there is potential for impacting the diversity of species within the various habitats by reducing population numbers of a particular species within the EPL. Pressures on the population numbers can potentially pressurize the populations within an area to an extent that causes the species to no longer exist within that area. Should a species be endemic to that same area then the risk of extinction is high. Altering the habitat can potentially result in the same outcome.</p> <p>For the most part the endemic species found within the area under assessment are also found elsewhere in the country. However, there may be exceptions and a precautionary approach must be taken. The species that are classified as Near Threatened, Vulnerable and Critically Endangered are those that although found elsewhere in Namibia should be taken cognizance of. Their specific habitat and feeding, breeding, nesting and migratory habits must not be impacted upon in the least degree.</p>

Status	Negative
Extent	Localized
Duration	Short to Medium term
Intensity	Serious effect if an individual/s is/are disturbed or destroyed/killed
Probability	Probable
Prevention	Though the habitats will remain relatively undisturbed due to the very low percentage footprint of activities planned, without prior knowledge of the whereabouts of the vulnerable, threatened and critically endangered species and their preferred habitat, it may not be possible to prevent an impact, regardless of how small it might be.
Significance (no mitigation)	High Though the intensity of the exploration is very low, as already explained, the significance of the impact is considered high based on the sensitivity of the species that occur here.
Mitigation	<p>Those areas targeted for exploration will be accessed along existing roads and tracks as far as possible. Many of the sites will initially be visited on foot. The latter two exploration phases may need to produce new tracks to access targeted sites. Dry water courses provide the next option for gaining access to remote sites for vehicles where no tracks formerly exist. These habitats are occasionally disturbed by flash floods and must re-establish communities of fauna and flora thereafter.</p> <p>Exploration teams need to be trained and provided orientation on how to best access sites for exploration</p>

	<p>with least impact on the observable and hidden signs of fauna and flora and their habitats.</p> <p>Rehabilitation of sites that have been explored must restore the sites, as far as is possible to their prior state to mitigate the visual impact and to allow for the best possible re-colonization of the site, by plants and animals.</p> <p>Tree surveys prior to clearing roads and drill pads are mandatory and forestry permits are required by law. NO PROTECTED TREES SHOULD BE FELLED.</p>
Significance (with mitigation)	Low
Confidence Level	Medium. Knowledge of the whereabouts of some species and their habitats may not be readily available and this makes it difficult to predict whether the low significance can be practically achieved. Surveys of the areas to be cleared will be required by the Forestry Directorate and bush clearing permits are to be issued by the same.

Groundwater and surface water Impacts

Risk Event	Exploration activities may affect the availability of water and the quality thereof
Nature of Impact	<p>Through the exploration for mineral resources there is potential for impacting:</p> <ul style="list-style-type: none"> ▶ Water availability for deep rooted trees in riverbeds (groundwater) ▶ Water availability and quality for people (groundwater) ▶ Risk of surface and groundwater

	<p>pollution</p> <p>► Risk of groundwater drawdown due to abstraction</p>
Status	Negative
Extent	Localized
Duration	Short to Long term
Intensity	Serious effect , permanent change to the availability of water would be devastating for the sustainable farming that occurs here.
Probability	Probable if boreholes puncture the Karst Formation, water abstraction is not controlled, or water pollution is not prevented
Prevention	It is possible to prevent over abstraction and pollution of water resources. It is also possible to prevent the puncturing of the Karst Formation through careful planning, knowledge and liaison with the Department of Water Affairs.
Significance (no mitigation)	High; Should the prevention measures not be in place then the significance of the impact will be high. The population carrying capacity is already low due to limited water resources.
Mitigation	No surface water bodies (eg. Farm dams) should be used for the exploration activities. Namwater could supply the exploration activities.

	<p>Farm boreholes may also be used but the sustainability of each farm borehole may differ. Again, only sustainable use of these sources should be made.</p> <p>The siting and drilling of boreholes for exploration must be carried out very carefully and not in any way jeopardize the sustainable use of water.</p> <p>Boreholes drilled in the field should not be contaminated in case they are linked to aquifers use of by nearby farmers. Should the company find good groundwater during the exploration activity, the borehole may be used as a water source provided the permission of the farmer is given and the necessary abstraction permit is attained from the department of water affairs. Again, only sustainable yields may be abstracted.</p> <p>Farmers may choose to maintain the new water boreholes after the exploration ceases.</p> <p>Camps and the setting up of ablution facilities must be done so that risks to groundwater quality are minimized.</p>
Significance (with mitigation)	Low
Confidence Level	High , only if the mitigations are carried out strictly. Guarantees must be given by the exploration company that they do not in any way damage the susceptible water resource.

Socio-Economic Impact

Risk Event	Positive aspect of sustaining employment in the sector.
------------	---

Nature of Impact	The project to be carried out at EPL 8759 site will employ a limited number of people involved with exploration on an intermittent basis. From 10 to 30 staff would be on site during the drilling phase depending on the intensity of the drilling program. On the negative side, the social and economic basis of the farms may be adversely affected by the presence and activities of the exploration team and equipment. Potential lowering of the security currently enjoyed could be potentially interrupted.
Status	Positive & Negative
Extent	Regional (radius of up to 100 km)
Duration	Short up to one year of drilling spread over a broad area.
Intensity	Moderate effect (for the positive) Moderate effect (for the negative)
Probability	Probable (both the negative and positive aspects)
Prevention	If the environmental clearance certificate is not forthcoming, then the positive impact is halted.
Significance (no mitigation)	Low (positive) The project will employ very few personnel, so it is not significant in the greater scheme of things. Medium (negative) The security of the farms could potentially be lowered through negligence and or intentional misuse of the privileged access to the

	farms.
Mitigation	<p>Where possible, local persons (i.e. from the adjacent towns and farms) should be employed. This depends on the level of skills the local persons have. Sustainable employment will result should the project be allowed to go ahead.</p> <p>The drilling program could take place during less busy tourism times and if necessary, increase the number of drill rigs during that time so as to shorten the period of activity.</p> <p>Company supervisory staff must manage the access to and from the farms very strictly ensuring the staff stay within predetermined areas and ensuring all inter leading gates etc. are closed and or locked as per the request of the farm owners.</p>
Significance (with mitigation)	<p>Low (positive)</p> <p>Low (negative)</p>
Confidence Level	High

Conclusion

In conclusion, this project in the EPL 8759 will explore base and rare metals, industrial minerals, dimension stone, precious metal group of minerals. Through exploring for these commodities, contributions to the Namibia's economy will be made and continued employment to the existing staff is made possible.

For all aspects of operations and prospecting work strict adherence to the company's environment, Health and Safety policies must be ensured. Environmental training of the work force as well as monitoring of all aspects pertaining to Environment, Health and Safety must be carried out in accordance with the approved EMP.

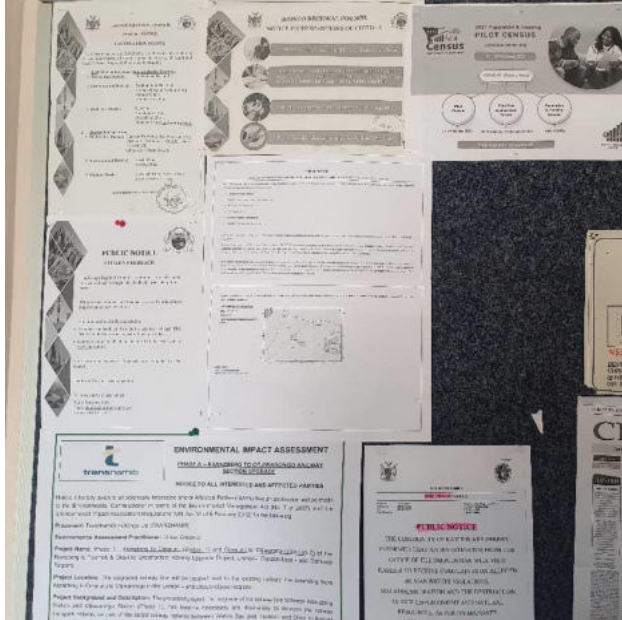
The exploration within the EPL the company will follow a phased approach, which will be in line with the relevant Namibian legislation and regulations. The exploration program will be conducted in line with the EMP thus implementing the necessary mitigation measures, monitoring and stipulated rehabilitation. It is of utmost importance that good relations are upheld with the farming community and other affected parties.

REFERENCES

- Mendelsohn, J., Jarvis, A., Roberts, C., & Robertson, T. (2003). Atlas of Namibia. A Portrait of the Land and its People. Cape Town: David Philip Publishers; New Africa Books (Pty) Ltd.
- Rothauge, A., 2017. Bush Control Manual. AgriConsult Namibia. Ed. Ina Neuberger Wilkie. John Meinert Printing ISBN 978 99945 85 83 0
- Marshall, T. & Baxter-Brown, R., 1995. Basic principles of alluvial diamond exploration. Journal of Geochemical Exploration, pp. 278-293.
- Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T., 2002. Atlas of Namibia: a portrait of the land and its people, Cape Town: David Philip.
- Miller, R.M. 1983. The Pan-African Damara Orogen of S.W.A./Namibia. Special Publication of the Geological Society of South Africa, 11, 431-515.
- Miller R. McG. (1992). Mineral resources of Namibia. Geological Survey of Namibia.
- Miller, R.M., 2008. Neoproterozoic and early Palaeozoic rocks of the Damara Orogen. In: Miller, R.M. (Ed.). The Geology of Namibia. Geological Survey of Namibia, Windhoek vol. 2, pp. 13-1–13-410. References.
- Monadjem, A., Taylor, P.J., F.P.D. Cotterill and M.C. Schoeman. 2010. Bats of southern and central Africa. Wits University press, Johannesburg, RSA.
- Müller, M.A.N. 2007. Grasses of Namibia. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.
- Schneider, G. & Seeger, K., 1992. Copper. In: s.l.:The Mineral Resources of Namibia, pp. 2.3, 1- 172.
- Skinner, J.D. and Chimimba, C.T. 2005. The mammals of the southern African sub region. Cambridge University Press, Cape Town, RSA.
- Taylor, P.J. 2000. Bats of southern Africa. University of Natal Press, RSA.
- Van Oudtshoorn, F. 1999. Guide to grasses of southern Africa. Briza Publications, Pretoria, South Africa.

APPENDIX A: SITE NOTICE PLACEMENTS AND NEWSPAPER ADVERTISEMENTS

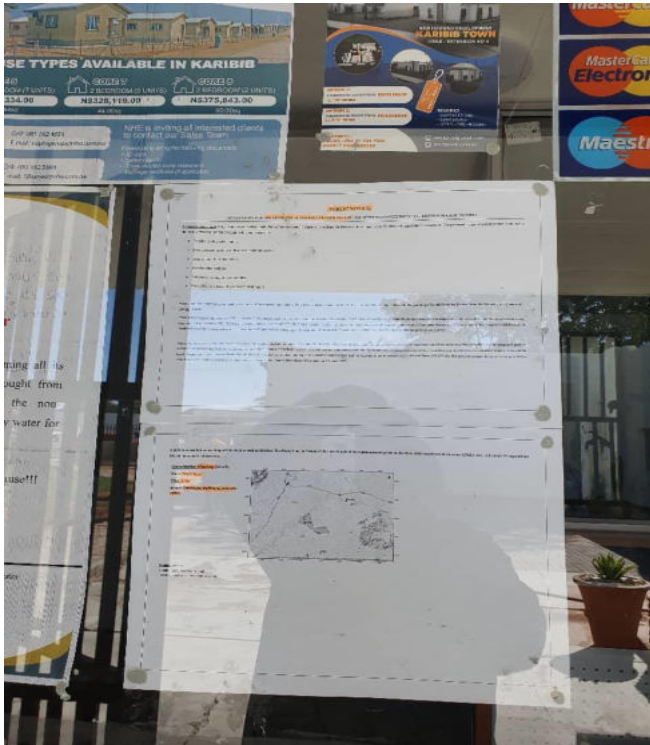
Spitzkoppe



Gangu Conservancy



Karibib



Appendix B: Background Information Document

Background Information Document (BID)

For EPL 8759, Erongo Region, Namibia

**Exploration application for Environmental Clearance
Certificate for Proposed EPL 8759.**

PROPONENT: Newcrest Investment CC

nndadhi@gmail.com +264 81 351 035 2

PREPARED BY: Hilya Amukwa

hamukwa@gmail.com +264 81 738 293 4

DATE: 04 May 2022

INTRODUCTION

Newcrest investment CC, proposes to undertake exploration activities on Exclusive Prospecting License (EPL) 8759 in the Erongo Region, with interest in base and rare metals, dimension stones, industrial minerals and precious metals. The EPL is located about 86.05 km north northeast of Arandis and about 70 km southwest of Usakos. It covers an area of 17782.2417 Ha and extends over the following Farms, namely: Twyfel, Vrede, Ootmoed, Schwarz Spitzkoppe, Oberwasser, Okambahe Reserve and Harmonie as seen in

Figure 1.

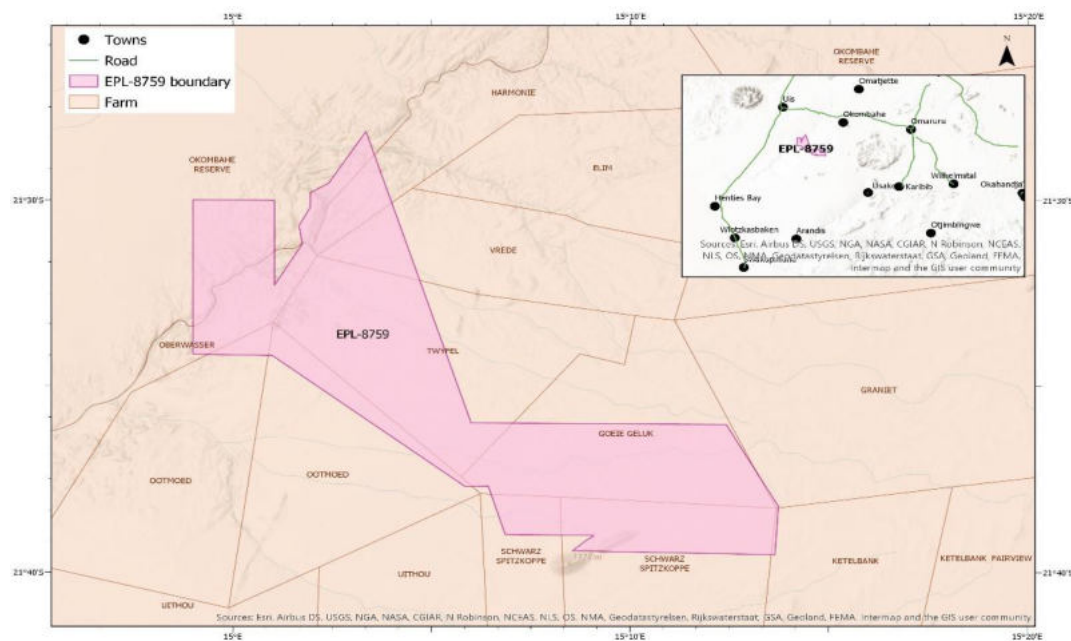


Figure 1: Location map of EPL 8759, showing farms covered and infrastructure in the area.

The extraction of mineral resources is a listed activity that must not be undertaken without an Environmental Clearance Certificate (ECC) from the Ministry of Environment and Tourism: Department of Environmental Affairs (MET: DEA). In order to inform the ECC decision, an Environmental Impact Assessment (EIA) process must be conducted as per the requirements of the Environmental Management Act (Act No. 7 of 2007) and its 2012 EIA Regulations. Therefore, this document was prepared as part of the EIA process for the following reasons:

- To introduce the proposed project and related activities to potential Interested and Affected Parties (I&APs);
- To provide information on the Environmental Assessment (EA) process and how I&APs can be involved;
- To invite all parties to register as I&APs on the Ministry of Environment, Forestry & Tourism's (MEFT) EA database so that they can remain informed about the status of the EA process for this project; and

- To provide all I&APs with an opportunity to comment or provide inputs/ concerns on the proposed project and associated process, including biophysical and socio-economic aspects, as well as any other issues of concern.

The overall aim of this stage of the EA process is to identify and consult Interested and Affected Parties (I&APs). The subsequent sections provide a brief background about the proposed activities.

PROJECT DESCRIPTION

The proposed activity will entail the following planned activities and construction/ erection of support infrastructure and services.

Planned activities

The exploration program will commence with

- Detailed geological mapping
- Detailed desktop study of historical exploration data
- Delineation of drilling targets
- Core logging analysis
- Laboratory testing of core samples
- Production of a feasibility of a technical report

Areas found to comprise good quality resource of the targeted minerals will then be delineated and pursued further for possible mining, subject to the granting of a valid mining license from the Ministry of Mines and Energy (MME).

Required support infrastructure, equipment and services

It is anticipated that the following infrastructure, utility services and equipment will be required to support the planned activities.

- Earth moving equipment
- Drilling equipment
- 4x4 bakkie
- Tented exploration camp equipment
- Mobile ablution activities
- Temporary core storage facility

Need and desirability of the project

The most important impact of mining in mine area is providing job opportunity; livelihood, and longer Mining brings life to the area and provides better life situation by making road, power, groundwater, health centres and schools. Waste materials into valley and preparing them for second use will provide new topography and new landscape.

ENVIRONMENTAL ASSESSMENT PROCESS

The Environmental Management Act (also referred to as the EMA), stipulates that for each developmental project, which is listed under the EIA regulations, an Environmental Impact Assessment (EIA) should be conducted. The aim of the EIA is to identify, assess and ascertain potential environmental impacts that may arise from the proposed activity.

Figure 2 below shows an environmental process flow chart that describes the different stages that the project will go through and undertake. Currently we are at the scoping stage.

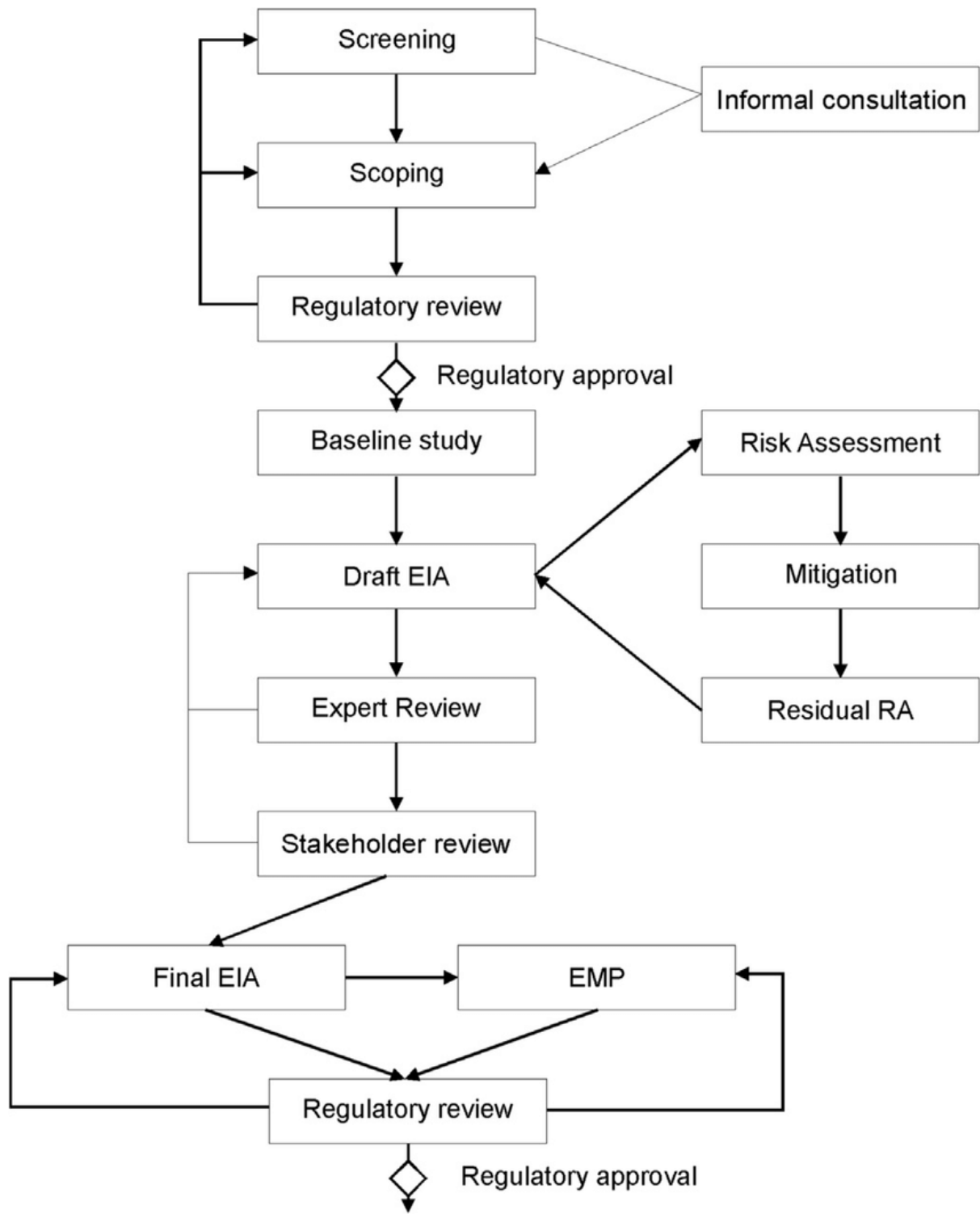


Figure 2

Potential Impacts

Positive impacts

- Employment
- Infrastructure
- Taxes and charges paid by companies to governments
- Contribution to GDP
- Better livelihood for the community
- Financial benefits to traditional authorities
- Improved logical understanding of the area

Negative impacts

- Air and noise pollution
- Health and safety issues
- Loss of biodiversity
- Contamination of soils
- Visual impacts

The public participation process

Public consultation is a crucial part of the environmental scoping process. It provides interested and affected parties (I&APs) an opportunity to find out more about the proposed activity and it allows a platform for the public to raise any issues or concerns.

Given the current situation of Covid-19 and the pronounced state of emergency, a public meeting will be held subject to compliance to wearing of masks fulltime. Therefore, I&APs are encouraged to submit their comments and concerns during the period of this EA. In order for these comments to be considered, they must reach us by the 16th July 2022 a public consultation meeting is scheduled for 9th July 2022 at the spitzeskope traditional authority office.

All those who register as I&APs for this EA process will be notified when the Scoping stage is complete and will receive an opportunity to comment and review the Scoping Report. The time for the public consultation meeting will be confirmed with interested and affected parties only.

Please find our contact details below should you require more information or if you would like to register as and I&AP:

Hilya Amukwa

Tel.: +264817382934

Email: hamukwa@gmail.com

Appendix C Heritage Council Consent Letter and Archaeologist report

ARCHAEOLOGICAL AND CULTURAL IMPACT
ASSESSMENT REPORT FOR MINERALS EXPLORATION ON AN EXCLUSIVE
PROSPECTING LICENSE (EPL) NO. 8759 USAKOS DISTRICT, ERONGO
REGION, NAMIBIA

Compiled by:

Henry Nakale [Bachelor of Arts Honours Degree in Archaeology,
Museums and Heritage Studies] (GZU), [Bachelor of Social Science in
Heritage and Museum Studies] (UP), [Masters of Social Science in
Tangible Heritage Conservation & Management] (UP).

&

Dr Mowa Eliot, Maritime Archaeology University of Bristol. PhD
Archaeology (UP).

Compiled for:

Newcrest Investment CC

04 September 2022

Project Details

Item	Description
Proposed development and location	Newcrest Investment CC (The Proponent) is intending to conduct exploration and drilling activities on Exclusive Prospecting License (EPL) 8759 to explore for Base and Rare Metals, Dimension Stone, Industrial Minerals and Precious Stone. The EPL is located about 86.05 km north northeast of Arandis and about 70 km southwest of Usakos in the Erongo Region. The EPL covers a surface area of 17782.2417 hectares (ha).
Title	ASSESSMENT REPORT FOR MINERALS EXPLORATION ON AN EXCLUSIVE PROSPECTING LICENSE (EPL) NO. 8759, ERONGO REGION, NAMIBIA
Purpose of the study	The purpose of this document is an Archaeological and Heritage Impact Assessment report that describes the cultural values and heritage factors that may be impacted on by the proposed exploration activities.
Coordinates	EPL Centered at 21°36'23" S 15°05'40" E
Municipalities	Usakos District
Predominant land use of surrounding area	Farming, Tourism and mining
Heritage Consultant	OTAH & ESM Cultural Heritage Consultants
Author(s) identification	Dr. Eliot Mowa & Mr. Henry Nakale

In terms of land ownership, the land - use of the EPL 8759 extends over the following Farms: Twyfel, Vrede, Ootmoed, Schwarz Spitzkoppe, Oberwasser, Okambahe Reserve and Harmonie.

Copyright

Authorship: This A/HIA Report has been prepared by Mr. Henry Nakale and Dr. Eliot Mowa. The report is for the review of the National Heritage Council of Namibia.

Copyright: This report and the information it contains is subject to copyright and may not be copied in whole or part without written consent of the authors.

This report can however be reproduced by IDT and The National Heritage Council of Namibia for the purposes of the Archaeological and Heritage Management in accordance with the National Heritage Act, 27 of 2004

Geographic Co-ordinate Information: Geographic co-ordinates in this report were obtained using a hand-held Garmin Global Positioning System device. The manufacturer states that these devices are accurate to within +/- 5 m.

Maps: Maps included in this report use data extracted from the NTS Map and Google Earth Pro.

Disclaimer: The Authors are not responsible for omissions and inconsistencies that may result from information not available at the time this report was prepared.

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the National Heritage Council Regulations and Guidelines as to the authorisation of proposed exploration project being proposed by Newcrest Investment CC.

Signed by:

Table of Contents

Executive Summary	6
1.0 Introduction.....	6
1.1 Project Description.....	9
2.0 Legislations	10
3.0 Approach to study	10
3.1 Terms of Reference.....	10
3.2 Methodology	11
4.0 Assumptions and Limitations.....	13
5.0 Brief heritage setting of the Project Area.....	13
5.1 Localized area	15
6.0 Fieldwork Findings and Observations	15
8.0 Conclusions and Recommendations	18
8.1 Management recommendations	18
Appendix 1)	19
The proponent is advised to implement the following management actions on the way forward:.....	19
8.2 Conclusions	21
References.....	22

Table 1; rating scales for the assessment of archaeological significance and vulnerability developed by the QRN.....	11
Table 2; Assessment criteria for the evaluation of cumulative impacts on archaeological sites developed by the QRN.....	12
Figure 1; Locality map for EPL 8759 in the Erongo region near the Klein Spitzkoppe(Source: Hilya Amukwa 2022).	8
Figure 2; Map of EPL 8759 (Source Hilya Amukwa 2022).....	9
Figure 3: Ruined building structures on farm Goieie Geluk within EPL 8759 (Sources: Authors 2022).	17
Figure 4; Targeted outcrop within EPL 8759 (Sources: Authors 2022).	17

Executive Summary

An archaeological impact assessment was carried out for Newcrest Investment CC focusing on the proposed exploration activities on EPL 8759 near the Klein Spitzkoppe Mountain in the Erongo region. The assessment therefore reviewed the archaeological records, historical documents from the previous studies surrounding the area, interview with locals and a field survey as a basis of inference to conclude that damage or disturb sites or materials protected under the National Heritage Act (27 of 2004) is unlikely to occur. However, due to the possibility that buried archaeological remains could come to light in the course of construction work the client is advised to adopt the Chance Finds Procedure attached as Appendix 1 to this report. of the selected target areas.

1.0 Introduction

Newcrest Investment CC has appointed OTAH and ESM Cultural Heritage Consultants (**JV**) to provide an archaeological/heritage assessment as envisaged under the provisions of the National Heritage Act (27 of 2004). This report presents the results of an archaeological/heritage field survey of the area, focusing on EPL 8759. The report suggests mitigation measures that would be in keeping with the applicable laws and policies governing the preservation of archaeological remains in Namibia. The EPL is located about 86.05 km north northeast of Arandis and about 70 km southwest of Usakos in the Erongo Region. The EPL covers a surface area of 17782.2417 hectares (ha) as shown in **figure 1**.

Newcrest Investment CC., hereinafter referred to as the proponent intends to carry out the following activities:

To undertake exploration and drilling activities on Exclusive Prospecting License (EPL) 8759 and to explore for industrial minerals, base, rare earth elements and precious metals, mineral deposits.

Due to the destructive tendency of such exploration activities, which may include earth-moving/land alteration operations, it is a pre-requisite to conducting an Archaeological and/ or Heritage Impact Assessment (AIA) as obligated by the National Heritage Act, Act No. 27 of 2004 and, in part, by the Environmental Management Act, Act No. 7 of 2007. The main thrust of the

provisions of the aforementioned legislation is to protect and salvage cultural/ archaeological and environmental resources from potential destruction resulting from exploration or mining activities.

It was against this background that an Archaeological Impact Assessment (AIA) was carried out on EPL 8759 to fulfil the following objectives:

- a) To identify and document cultural/ archaeological materials and sites occurring in the area within and around the EPL.
- b) To assess the nature and scale of archaeological impact of the exploration activities on heritage resources.
- c) To suggest some conservation strategies for the cultural heritage resources that might occur in the area proposed for explorations which can be potentially destroyed in the course of such activities.

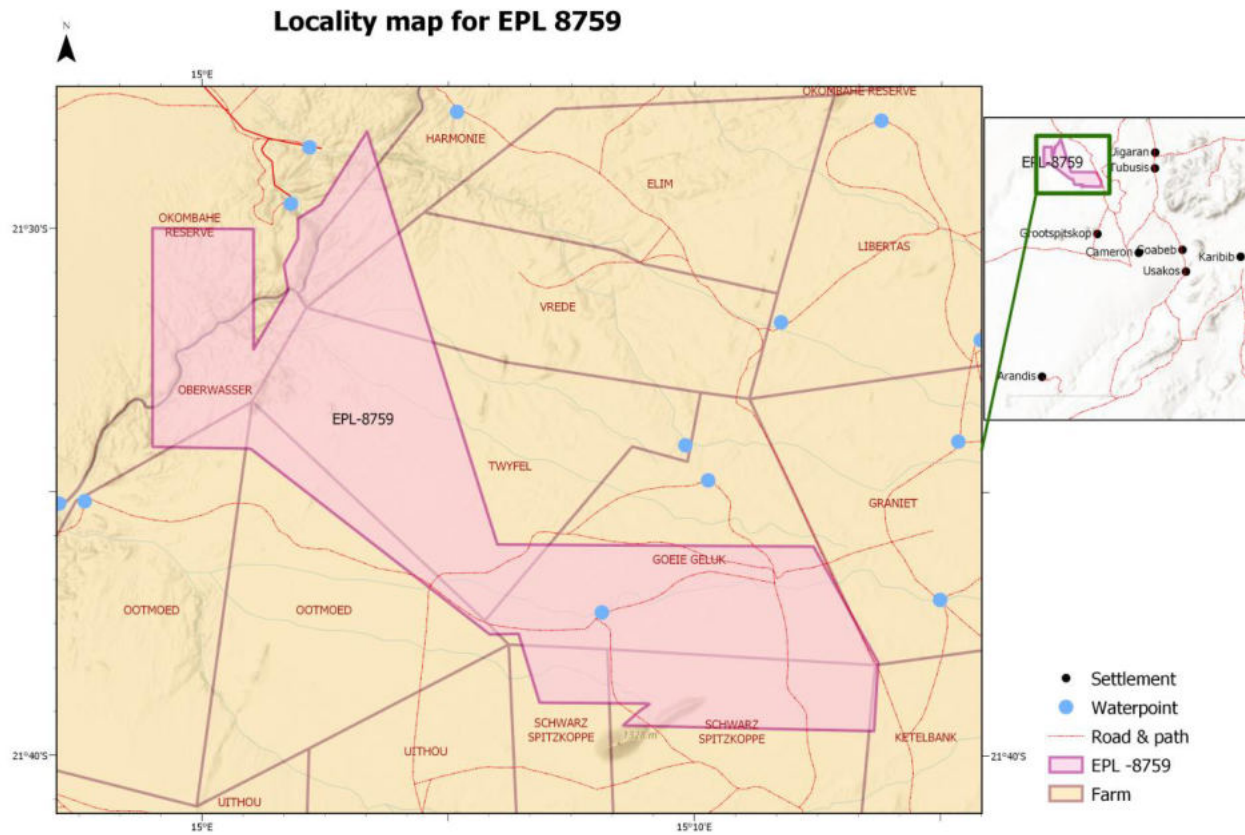


Figure 1; Locality map for EPL 8759 in the Erongo region near the Klein Spitzkoppe(Source: Hilya Amukwa 2022).

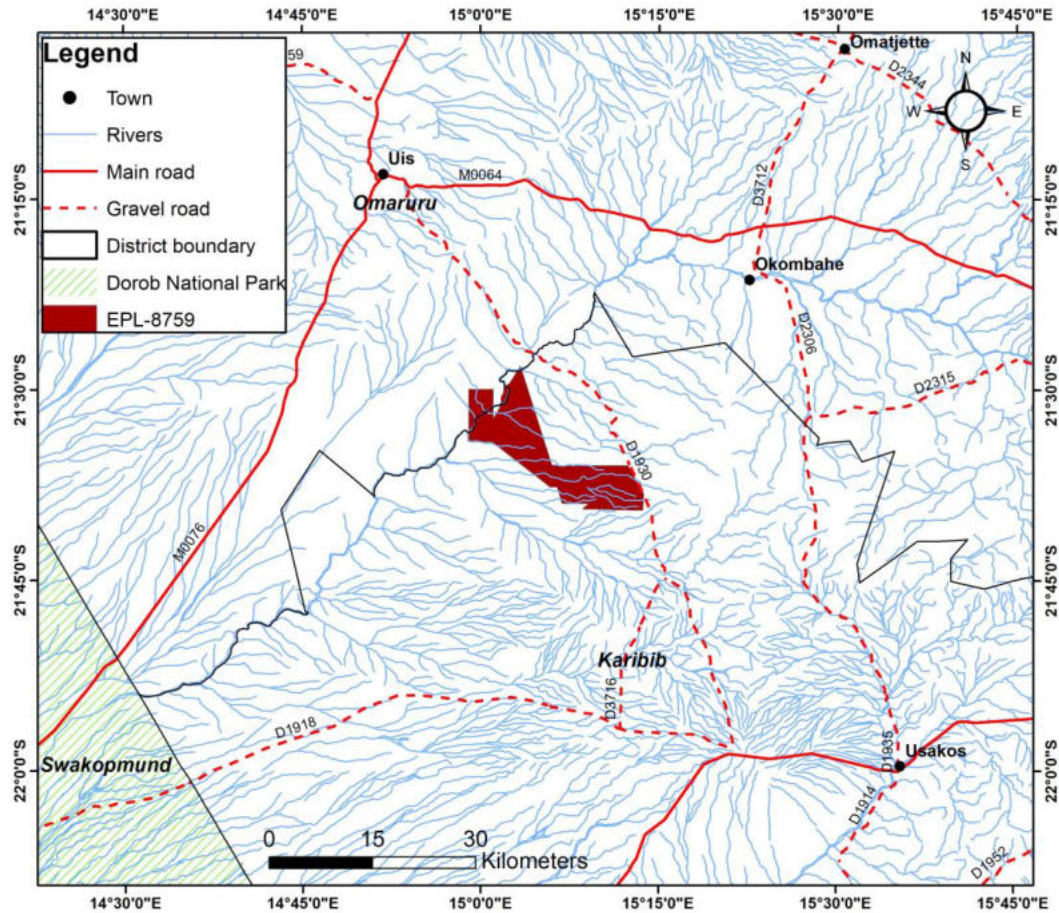


Figure 2; Map of EPL 8759 (Source Hilya Amukwa 2022).

1.1 Project Description

The proposed activity will entail the following planned activities and construction/ erection of support infrastructure and services.

Planned activities

The exploration program will commence with

- || Detailed geological mapping
- || Detailed desktop study of historical exploration data
- || Delineation of drilling targets
- || Core logging analysis
- || Laboratory testing of core samples
- || Production of a feasibility of a technical report

Areas found to comprise good quality resource of the targeted minerals will then be delineated and pursued further for possible mining, subject to the granting of a valid mining license from the Ministry of Mines and Energy (Hilya Amukwa 2022).

2.0 Legislations

In most cases where the aspect of mining is involved, cultural and archaeological evidence located within areas earmarked for development or mining usually faces the danger from complete destruction. The legal instrument for the protection of heritage sites and objects in Namibia is the National Heritage Act (No. 27 of 2004).

To ensure that this unique heritage of our past is protected and well documented, the National Heritage Act 27 of 2004 and EIA Terms of Reference concerning the assessment of impacts of the proposed development on the cultural and heritage resources associated with the receiving environment shall be used to guide the exploration exercise. The statutory mandate of heritage impact assessment studies is to encourage and facilitate the protection and conservation of archaeological and cultural heritage sites, following the provisions of the National Heritage Act, Act 27 of 2004 and Environmental Management Act (EMA) No. 7 of 2007 and its 2012 EIA Regulations. The National Heritage Act (Section 1 of 2004) defines heritage resources as those of geological and rare objects; paleontological; archaeological; ethnographic objects; historical objects/sites; maritime heritage; built monuments; mining sites as well as objects of scientific interests.

3.0 Approach to study

3.1 Terms of Reference

The main essence of the archaeological survey and assessment was to identify and record all sensitive archaeological sites within the limits of EPL 8759 that could negatively be affected by the above-mentioned project. The assessment is also intended to establish the heritage significance of possible resources and assess their vulnerability, estimate the extent of the possible impacts and establish the site and project-specific mitigation measures. This study is intended to satisfy the requirements of the Environmental Management Act (7 of 2007), and those of the National Heritage Act (27 of 2004).

3.2 Methodology

This Heritage & Archaeological Impact Assessment followed a desktop-based assessment, interview with local community members and field surveys. These methodologies are standards for environmental and heritage assessment in Namibia, which are in line with international best practices. Desktop information was fashioned from current and existing heritage archives. These were taken from existing heritage records comprising those from the National Heritage Council, archaeological GIS spatial data and record that has been substantially exposed during the last decades, by a series of detailed archaeological assessments carried out during the mineral investigation and mining operations, and the development of infrastructure required by these operations. These sources were then supplemented by site visit fieldwork within EPL 8759.

Sensitivity and susceptibility rating scales, aimed at establishing the nature of vulnerability and sensitivity of heritage resources that are likely to be impacted by the exploration activities, were adopted as per assessment objectives. Their vulnerability to the disturbance in the course of exploration that includes drilling was evaluated according to parallel 0-5 scales, abridged in Table 1.

Table 1; rating scales for the assessment of archaeological significance and vulnerability developed by the QRN.

Significance Rating	
0	No heritage significance
1	Disturbed or secondary context, without diagnostic materials
2	Isolated minor finds in undisturbed primary context, with diagnostic materials
3	Archaeological and paleontological site (s) forming part of an identifiable local distribution or group
4	Multi-component site (s), or central site (s) with high research potential
5	Major archaeological or paleontological site (s) containing unique evidence of high regional significances
Vulnerability Rating	

0	Not vulnerable
1	No threat posed by current or proposed development activities
2	Low or indirect threat from possible consequences of development (e.g., soil erosion)
3	Probable threat from inadvertent disturbance due to proximity of development
4	High likelihood of partial disturbance or destruction due to close proximity of development
5	Direct and certain threat of major disturbance or total destruction

Concerning each specific source of impact risk to heritage resources, the assessment methodology estimated the extent of the impact, the magnitude of impact, and the duration of these impacts. The scales of estimation are set out and explained in Table 2.

Table 2; Assessment criteria for the evaluation of cumulative impacts on archaeological sites developed by the QRN.

CRITERIA	CATEGORY	DESCRIPTION
Extent or spatial influence of impact	National	Within Namibia
	Regional	Within the Region
	Local	On site or within 200 m of the impact site impact
Magnitude of impact (at the indicated spatial scale)	High	Social and/or natural functions and/ or processes are severely altered
	Medium	Social and/or natural functions and/ or processes are notably altered
	Low	Social and/or natural functions and/ or processes are slightly altered
	Very Low	Social and/or natural functions and/ or processes are negligibly altered
	Zero	Social and/or natural functions and/ or processes are negligibly altered

		Social and/or natural functions and/ or processes remain unaltered
Duration of impact	Short Term	Up to 3 years
	Medium Term	4 to 10 years after construction
	Long Term	More than 10 years after construction

4.0 Assumptions and Limitations

This heritage impact assessment described here relies on desktop studies and is supported by field assessments undertaken. It is possible to predict the likely occurrence of further archaeological sites with some accuracy and to present a general statement of the local archaeological site distribution. Nevertheless, it is critical as a precautionary measure and best practice, we are recommending the proponent to strictly follow the chance find procedure as the project progresses should any archaeological objects be found during drilling and trenching. The Chance finds procedure is outlined in the National Heritage Council booklet, (2017) and the proponent will be supplied with a copy. Failure to follow and implement such a procedure will result in appropriate action being taken against the proponent as per the Heritage Act of 2004.

5.0 Brief heritage setting of the Project Area

This western part of Namibia is arid and presents a harsh environment for human habitation. However, these harsh environmental condition still retains some attractive attributes that led to the habitation of the Erongo Mountains, Brandberg mountains, Spitzkoppe and Twyfelfontein. According to Nankela (2020) these areas accorded humans minimum basic needs such as water and wild game since under the mountain topography enables orographic rainfall that forms localized micro-climates to meet the basic needs of the early settlers. Available archaeological evidence is characterized by short periods of relatively intense occupation, and long periods in which there appears to have been little or no human presence (Kinahan 2011). This is apparent as observed by the early researchers within the greater Erongo, it has been theorized that such

evidence of human occupation and subsequent desertion by the original artists of the many rock paintings and engravings in the Erongo region, is a consequence of environmental and climatic changes. Resulting in the movement and migration of wildlife northward, which was subsequently pursued by humans resulting in the desertion of the rock paintings and engravings by the original artists.

The Erongo region has been the focus of several archaeological surveys and assessments during the last two decades. These surveys have helped to determine the local archaeological sequence and to establish the relationship between archaeological sites and the types of terrain that characterize the area, including gravel outwash fans, granite outcrops and the many dolerite ridges that crisscross the landscape. However, archaeological surveys for mining and infrastructure projects are highly focused on a specific localized area of particular projects and do not therefore as a rule reflect the wider archaeology of the entire spatial area that shares similar topography and geologic composition characteristics. Cumulative results of earlier surveys indicate the archaeological importance of this general area, although the intensity of the survey varies considerably and large parts of the area are archaeologically unknown (Kinahan 2020).

According to Kinahan (2011) the general sequence and archaeological characteristics of the area under consideration, based on current knowledge, are as follows:

- a. Early to mid-Pleistocene** (ca. 2my to 0.128my; OIS 6, 7, 19 &c): represented by surface scatters of stone tools and artefact debris, usually transported from original context by fluvial action, and seldom occurring in sealed stratigraphic context.
- b. Mid- to upper Pleistocene** (ca. 0.128my to 0.040my; OIS 3, 4 & 5a-e): represented by dense surface scatters and rare occupation, evidence in sealed stratigraphic context, with occasionally associated evidence of food remains.
- c. Late Pleistocene to late Holocene** (ca. 0.040my to recent; OIS 1 & 2): represented by increasingly dense and highly diverse evidence of settlement, subsistence practices and ritual art, as well as gravesites and other remains.

5.1 Localized area

The area under study lies about 25 km northeast of the Spitzkoppe mountain. The history of archaeological research at the Spitzkoppe reaches back to 1917 when the Bushman Paradise was first excavated by the geologist Reuning (Vogt, 2006). In subsequent years it was studied by, among others, the French prehistoric cave art specialist, Abbé Henri Breuil in 1948 (Breuil, 1955). Various expeditions to the Bushman Paradise were made by Dr. Ernst Scherz with an aim of recording the prehistoric art (Scherz, Denninger, & Breunig 1986). Kinahan made the first systematic survey of the Spitzkoppe archaeological region and recorded 37 rock art and archaeological sites including the Bushman Paradise. According to Kinahan (1990), the site yielded evidence for an early transition from a hunter gatherer to herding economy. Part of the evidence is the paintings of what Kinahan has identified as cattle (Kinahan, 1990, p. 9).

6.0 Fieldwork Findings and Observations

A detailed field survey was carried out within the footprints of EPL 8759 on the 24 July and 27 August 2022 respectively. The field survey aimed at recording and locating the most important archaeological features that might be negatively impacted by the proposed exploration activities within the boundaries of EPL8759. The field survey involved a combined approach which included foot survey, public consultation meeting and one-on-one interviews with Mr. Benjamin Naruseb (Headman) and some community members. Three undated

abandoned historical building structures were recorded within the Goieie Geluk resettlement during these field survey, the field survey team further recorded two graves in farm Ootmoed but they are laying outside the concerned EPL. The site locations are set out below together with brief remarks on their significance. The vulnerability of the sites is given in terms of their distance from the explorations target area.

During the public consultation meeting and one – on – one interviews, the community members confirmed that there are no any other known potential heritage sites within the footprints of EPL 8759. However, areas like Oberwasser and Okambahe Reserve are zoned off and currently not occupied because they are used as breeding areas for the wild animals. The field survey team

also learned that there are several small scale mining activities going on within the areas of Twyfel, Goieie Geluk, Harmonie and Swarz Spitzkoppe.

Site 1; Ruined Building Structures

Site coordinates: 21° 36'44.08" S 15°11'41.75" E

Description: Abandoned undated building structures

Significance rating: 1 (Historical significance)

Vulnerability rating: 2 (Low or indirect threat from possible consequences of development, the abandoned structures are adjacent to the farm house)

Site 2; Graves

Site coordinates: Outside the EPL boundaries

Description: Two graves,

Significance rating: 1 (historical significance).

Vulnerability rating: 2 (Low or indirect threat from possible consequences of development, the two graves are in close proximity to the farm house).



Figure 3: Ruined building structures on farm Goieie Geluk within EPL 8759 (Sources: Authors 2022).



Figure 4; Targeted outcrop within EPL 8759 (Sources: Authors 2022).

8.0 Conclusions and Recommendations

EPL 8759 have recorded two possible historical sites dating back the colonial era. With such evidence, it is highly possible that subsurface remains may be exposed during site preparation and explorations activities, therefore the chance find procedure is highly recommended.

The significance rating of these sites is referred to in Table 1 and ranges from 0 to 1. They are considered as low value archaeological or heritage resources. In terms of their vulnerability rating, both sites are rated 0 (not vulnerable) but these sites will require mitigation measures should the proponent wish to expand their area of exploration.

8.1 Management recommendations

Appropriate impact mitigation measures to be adopted in the course of the project would include: location details of both sites to be incorporated within the project GIS and EMP.

- a) Creation of a 50-meter radius buffer zone for site 1 recorded in this assessment. Further research or investigation of this site is highly recommended.
- b) Site inspection by the heritage council of the buffer zone to ensure the proponent abide by the conditions as set by the heritage council.
- c) Adopt the Chance Find Procedure
- d) Oberwasser and Okambahe Reserves should be excluded from the exploration activities as this are zoned off as breeding areas, should the proponent wish to expand their exploration activities within these two reserves then a field survey should be carried out by a qualified archaeologist.

Appendix 1)

The proponent is advised to implement the following management actions on the way forward:

1. **Chance Finds Procedure (CFP) management guideline:**

EPL 8759 is an important mining infrastructure development area subject to heritage and archaeological assessment at the planning stage. These assessments were desktop-based, and field surveys were carried out therefore; significant subsurface heritage resources might be discovered. Onsite personnel and contractors must be sensitized to recognize “chance finds heritage” in the course of their work. The procedure set out here covers the reporting and management of such finds. The CFP covers the actions to be taken from the discovery of a heritage site or object to its investigation and assessment by a trained archaeologist. The CFP is intended to ensure compliance with the relevant provisions of the National Heritage Act (27 of 2004), especially Section 55 (4): “a person who discovers any archaeological objects must as soon as possible report the discovery to the council”. The procedure of reporting set out below must be observed so that heritage materials are reported to the authorities.

A. Responsibilities:

Operator to exercise due caution if archaeological remains are found

Foreman to secure site and advise management timeously

Superintendent to determine safe working boundary and request inspection

Archaeologist to inspect, identify, advice management, and recovers remain

B. Procedure:

Action by the person (operator) 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

C. Action by foreman:

- Report findings, site location and actions are taken to the superintendent
- Cease any works in the immediate vicinity

D. Action by superintendent

- Visit the site and determine whether work can proceed without damage to findings;
- Determine and mark the exclusion boundary
- Site location and details to be added to the Archaeological Heritage database system

E. Action by archaeologist

- Inspect site and confirm the addition to AH database system;
- Advise National Heritage Council and request a permit to remove findings;
- Recovery, packaging and labeling of findings for transfer to National Museum

F. In the event of discovering human remains

- Actions as above;
- Field inspection by archaeologist to confirm that remains are human;
- Advise and liaise with NHC Guidelines; and
- Recovery of remains and removal to National Museum or National Forensic Laboratory, or as directed.

8.2 Conclusions

At this stage it is important that the proponent is made aware of the fact that archaeological/heritage sites in the project area are protected under the National Heritage Act (27 of 2004). When exploration is underway, the proponent should make sure that all personnel and contractors are aware of the protected nature of archaeological sites as well as the legal obligation to report any new finds to the National Heritage Council as soon as possible. The proponent should take steps to avoid either direct damage to the sites or to their immediate landscape setting.

References

Gwasira G. and Katjuongua, G. 2006 A condition assessment of the prehistoric art from the Bushman Paradise Cave, Große Spitzkoppe. University of Namibia.

Kinahan, J. 2005. The late Holocene human ecology of the Namib Desert. In Smith, M, and Hesse, P. eds 23 Degrees South: Archaeology and Environmental History of the Southern Deserts. Canberra, National Museum of Australia pp120-3

Kinahan, J. 2013. Recent grave site on Farm Otjikoto 573, Otjozondjupa Region, Report to B2 Gold, Namibia.

Kinahan, John. 2012. Archaeological Guidelines for Exploration & Mining in the Namib Desert, the Namibia Archaeological Trust.

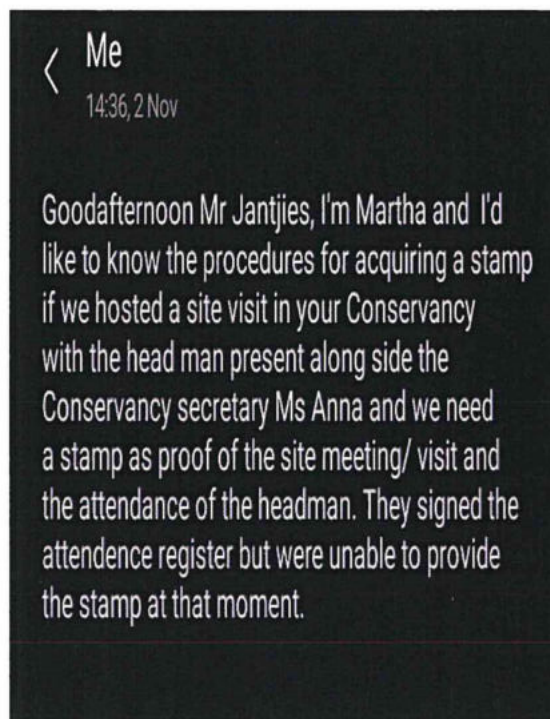
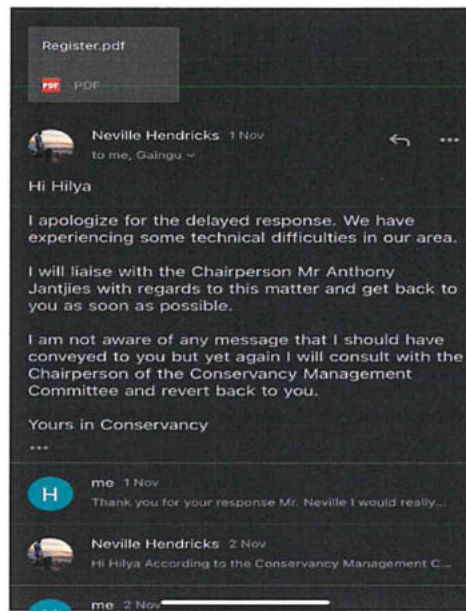
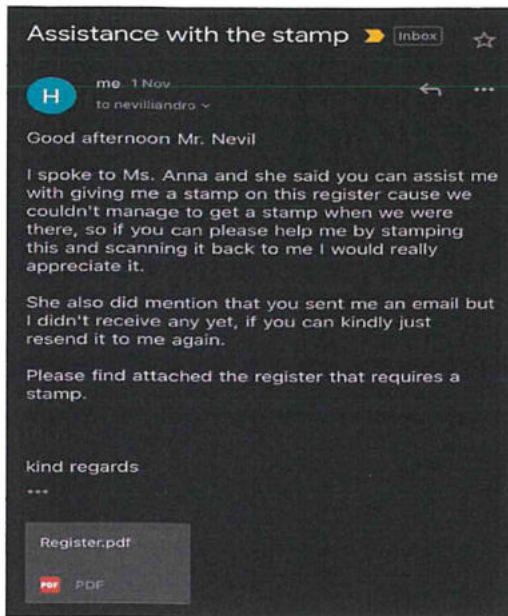
National Heritage Act 27 of 2004.2004. Government Gazette

Public consultation and interview with community members. Communication (2022).

Wendt, W.E. 1972. Preliminary report on an archaeological research programme in South West Africa. Cimbebasia (B) 2: 1-61.

Appendix D Attendance register and communication

Communication with the conservancy chairperson



Appendix E Stakeholder List

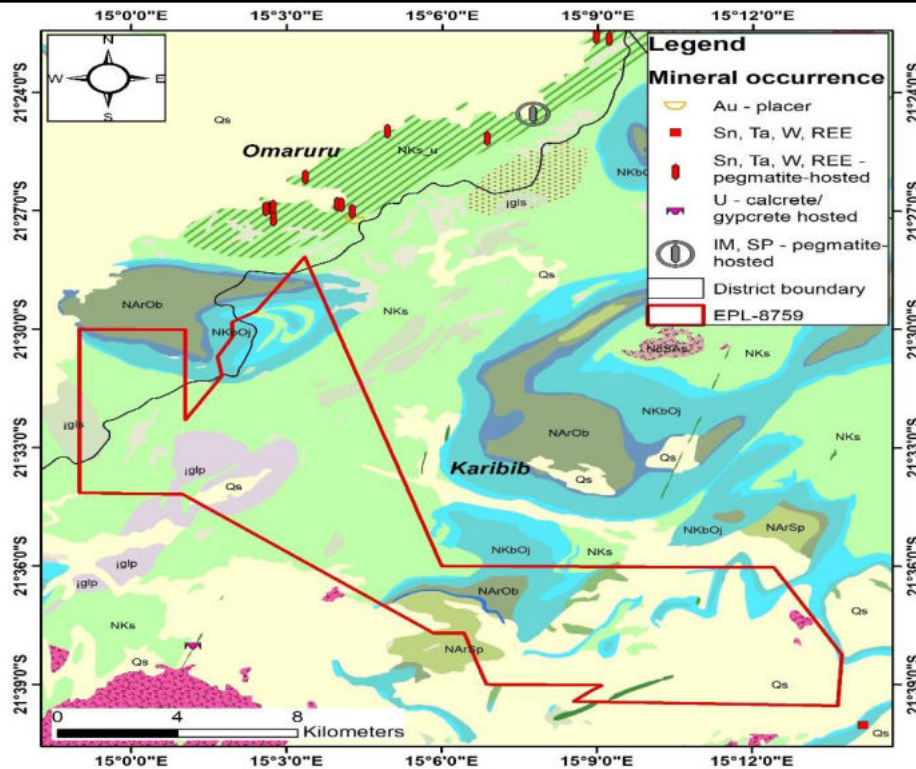
Stakeholder List of EPL 8759

Stakeholders List			
Proponent:	Newcrest Investment cc		
	Organisation	Contact person	Department/Position/Affiliation
SEA/EIA Project Team	Gaia Consultants cc	Hilya Amukwa	Environmentalist
	Organisation	Contact person	Department/Position
Central Government	Ministry of Environment and Tourism	Theo Nghithila	Executive Director
		Timoteus Mufeti	Environmental Commissioner
		Caroline Garusoas	Deputy Environmental Commissioner
		Saima Angula	Deputy Director: Environmental Assessment, Waste Management, Pollution Control and Inspections
	Ministry of Agriculture, Water & Land Reform	Mr. Percy Misika	Executive Director
		Margaret Kalo	Senior Public Relations Officer
	Ministry of Mines & Energy	Mr. Simeon Negumbo	Executive Director
		Erasmus Shivolo	Mining Commissioner
		Mathews Amunghete	Chief Inspector of Mines
	Ministry of Urban and Rural Development	Nghidinua Daniel	Executive Director
		Niita Iipinga	Dep. Director: Resettlement
		Organisation	Contact person
Regional GRN	Erongo Regional Council	Neville Adre	Governor
		Ms Ludmilla H Doeses	Chief Regional Officer
		Mr Meroro	Deputy Director: Planning

Appendix F EMP

2022

Environmental Management Plan (EMP) FOR EPL 8759



Hilya Amukwa -- Environmental Practitioner

Martha Haludilu – Information Specialist

Table of Contents

Purpose of Environmental Management Plan (EMP)	3
Project Phases Covered in the EMP	4
Legal Implications and obligations under the EMP	4
Environmental Management Principles	5
Commitment and Accountability:	5
Competence	6
Risk Assessment, Prevention and Control	6
Performance and Evaluation	6
Stakeholder Consultation	6
Continual Improvement	6
Organization plan: Roles and responsibilities	6
Identified impacts on bio-physical environment Negative Impacts	7
Air quality: Dust emissions	7
Mitigation Measures to be enforced	7
Monitoring	8
Table 1: The roles and responsibilities of various stakeholders to the EMP	8
Table 2: The roles and responsibilities of various stakeholders, environmental indicators and objectives	10
Table 3: The implementation of the objectives should be adhered to as indicated in the table	11
Table 4: Summary of environmental impacts, mitigation measures and monitoring plan for all project phases.....	12
<i>Construction Phase</i>	12
<i>Operational Phase</i>	16
<i>Decommissioning phase</i>	20
Resource required	22
Table 5. The qualitative assessment of air quality impacts for the movement of vehicles on un-paved roads and drilling activities.	22
Noise pollution from vehicles, drilling and other activities	22
Mitigation Measures to be enforced:	22
Table 6. Shows the qualitative assessment of noise.	23
Monitoring	23

Impacts on terrestrial biodiversity Flora/ Vegetation	23
Mitigation Measures to be enforced: Flora	23
Mitigation Measures to be enforced: fauna	24
Methods for monitoring:	24
Table 7. Shows the qualitative impact assessment for biodiversity related to the exploration activities and the impact of personnel on biodiversity.....	25
Alien invasive plants	25
Mitigation Measures to be enforced:	25
Table 8. Shows the qualitative impact assessment of alien invasive.....	25
Methods for monitoring:	26
Land-use and land contamination	26
Table 9. Shows the qualitative impact assessment for land use related to the exploration activities.	26
Actions/Mitigation measures:	26
Groundwater and surface water contamination Mitigation Measures to be enforced:	26
Table 10. Shows the qualitative assessment of surface water and groundwater impacts:.....	27
Compliance and Performance Monitoring, Reporting and corrective actions for the EMP	36
Conclusion	42
RECOMMENDATIONS	43
References	44

Purpose of Environmental Management Plan (EMP)

Environmental management plan (EMP) serves as a tool that can ensure sustainable mineral exploration, as it contains measures aimed at protecting, rehabilitating and restoring the environment to its productive state before, during and after exploration. It serves as a risk strategy that contains logical framework, monitoring programs, mitigation measures and management control. The aim of an Environmental Management plan (EMP) is to develop procedures to implement project's mitigation measures and monitoring requirements. It is deemed as a risk strategy that contains logical framework and management control strategies to minimize potential environmental impacts to significant level. The EMP ensures the community that the environmental management of the project is acceptable. As well as stipulating the roles and responsibilities of persons involved in the project. An EMP ensures that legal and policy requirements are well known and understood by the proponent, its employees and contractors and will be strictly enforced by its management team. Issues and concerns identified in the EIA will form a set of environmental specifications that will be implemented on site.

The control measures described in this EMP have been developed following consideration of the findings of the Environmental Impact Study (EIS), which concluded that a number of environmental values would be impacted by the proposed exploration activities. The intent of the proposed control measures is to ensure that project related activities will not negatively affect the environment, or the health, welfare and amenity of people and land uses by meeting or exceeding statutory requirements.

Furthermore, overall objectives of this EMP are:

- ✓ To develop measures that will mitigate the adverse impacts of the proposed project
- ✓ Ensuring compliance with regulatory authority stipulations and guidelines
- ✓ To formulate measures to enhance the value of environmental components where possible.
- ✓ To formulate measures to protect environmental resources as well enhance the value of environmental components where possible.

- ✓ Responding to unforeseen events and providing feedback for continual improvement in environmental performance.

Project Phases Covered in the EMP

The following phases are addressed in this EMP:

- ✓ **Exploration phase:** this is the phase where the proponent will be carrying out exploration of mineral and other minerals. It is also the time when proponent has to undertake maintenance and care of the environment and machinery.
- ✓ **Environmental monitoring phase:** this is the phase when mitigation measures are implemented, and the monitoring plan put in place. This phase runs concurrently with the exploration and decommissioning.
- ✓ **Decommissioning phase:** This is the phase when exploration activities cease as a result of either poor exploration results or loss of market demand for the targeted commodity. Rehabilitation measures will have to put in place during exploration and before decommissioning.

Legal Implications and obligations under the EMP

The EMP will be sent to the Directorate of Environmental Affairs and Forestry (DEAF) of the Ministry of Environment, Forestry and Tourism (MEFT) for approval. Once the DEA is satisfied with the contents of the EMP, they will issue an Environmental Clearance Certificate (ECC) to the Proponent to commence with the exploration in the proposed area. The ECC is linked with the recommendations of the Environmental Management Plan. Once the ECC is issued, the EMP becomes a legally binding document and each role-player including contractors and subcontractors are made responsible to implement the relevant sections of the EMP and is required to abide by the conditions stipulated in this document. (Environmental Management Act 7 of 2007)

Environmental Management Principles

The proponent will ensure that all parties involved in the project uphold the following broad aims:

- i.** All persons will be required to conduct all their activities in a manner that is environmentally and socially responsible. This includes all consultants, contractors, and sub-contractors, transport drivers, guests and anyone entering the exploration area in connection with the exploration project.
- ii.** Health, Safety and Social Well Being
 - ✓ Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against natural dangers on site, and radiation hazards; and,
 - ✓ Promote good relationships with the local authorities and their staff.
- iii.** Biophysical Environment
 - ✓ Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
 - ✓ Prevent or minimize environmental impacts;
 - ✓ Prevent air, water, and soil pollution, Biodiversity conservation and due respect for the purpose and sanctity of the area.

To achieve these aims, the following principles need to be upheld.

Commitment and Accountability:

The proponent senior executives and line managers will be held responsible and accountable for: Health and safety of site personnel while on duty, including while travelling to and from site in company vehicles and environmental impacts caused by exploration activities or by personnel engaged in the exploration activities, including any recreational activities carried out by personnel in the area. This will be upheld by the following:

Competence

The proponent will ensure a competent work force through appropriate selection, training, and awareness in all safety, health and environmental matters.

Risk Assessment, Prevention and Control

Identify, assess and prioritize potential environmental risks. Prevent or minimize priority risks through careful planning and design, allocation of financial resources, management and workplace procedures. Intervene promptly in the event of adverse impacts arising.

Performance and Evaluation

Set appropriate objectives and performance indicators. Comply with all laws, regulations, policies and the environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.

Stakeholder Consultation

Create and maintain opportunities for constructive consultations with employees, authorities, other interested or affected parties. Seek to achieve open exchange of information and mutual understanding in matters of common concern.

Continual Improvement

Through continual evaluation, feedbacks, and innovation, seek to improve performance regarding social health and well-being and environmental management throughout the lifespan of the exploration project.

Financial Provisions for exploration

In line with Namibia's environmental rehabilitation policy, the proponent will make the necessary financial provision for compliance with the EMP.

Organization plan: Roles and responsibilities

The environmental aspects which may be affected by the proposed project have been categorized into negative and positive impacts as an extension of the preceding sections. This section

summarizes the objectives, indicators to be observed, schedules to be adhered to and roles and responsibilities of various stakeholders to the EMP.

Identified impacts on bio-physical environment Negative Impacts

The following potential effects on the environment during the construction, operation and decommissioning phase of the quarrying project have been identified:

Air quality: Dust emissions

Mitigation Measures to be enforced

- ✓ Dust suppressants shall be applied to all the exploration activities as well as all off roads and gravel roads.
- ✓ The speed of exploration vehicles must be strictly controlled to reduce dust or prevent deterioration of the roads being used.
- ✓ All off roads in the project area should have a speed limit of 50km/h in order to minimize the amount of dust generated by vehicles.
- ✓ During high wind conditions the proponent must make the decision to cease works until the wind has calmed down.
- ✓ Use of personal protective equipment for proper dust control for respiratory protection and other necessary PPE (gloves, work suits, sun hats etc.).
- ✓ Converting high-use vehicles to cleaner fuels, where feasible
- ✓ Installing and maintaining emissions control devices, such as catalytic converters.
- ✓ Implementing a regular vehicle maintenance and repair program.
- ✓ The movement of drilling related vehicles on unpaved access track will be on a small scale.
- ✓ Water sprays should be used around the lay-down area when drilling, especially when performing reverse circulation, where water is not used.

- ✓ Regardless of the size or type of vehicle, fleet owners /operators should implement the manufacturer recommended engine maintenance programs.

Monitoring

- ✓ Daily inspection by the ENC of the gravel roads and exploration site on possible dust creation that requires attention.
- ✓ Daily inspection on site by the ENC to ensure that all workers are wearing their protective clothes at all time during the exploration process and the dry skin contact with gloves is prevented.

Table 1: The roles and responsibilities of various stakeholders to the EMP

Proponent	<ul style="list-style-type: none"> ✓ Responsible for the management and implementation of the EMP ✓ Ensure environmental policies are communicated to all personnel throughout the proposed project and that employees understand the guidelines of the EMP ✓ Responsible for providing the resources required to complete the projecttasks ✓ Appoint a safety health and environment manager and supporting officers,and ✓ Ensure all workers are inducted on safety measures. ✓ Ensure that all contract workers, sub-contractors and visitors to the site areaware of the requirements of this EMP, relevant to their roles and always adhere to this EMP ✓ Report any non-compliance or accidents to the Safety Health and Environment Manager.
------------------	--

<p>Safety Health and Environment management</p>	<ul style="list-style-type: none"> ✓ Oversee safety health and environment related activities ✓ Monitor daily operations and ensure adherence by personnel to the EMP ✓ Maintain the community issues and concerns register and keep records of complaints, and ✓ Maintain an up-to-date register of employees who have completed site induction. ✓ Receive, recording and responding to complaints ✓ Ensure adequate resources are available for the implementation of the EMP ✓ Ensure safe and environmentally sound operations, and ✓ Responsible for the management, maintenance, and revisions of this EMP
<p>Employees</p>	<ul style="list-style-type: none"> ✓ Adhere to measures set out in the EMP ✓ Ensure they have undertaken a site induction, and ✓ Report any operations or conditions which deviate from the EMP as well as any non-compliant issues or accidents to the environmental manager
<p>Traditional authority</p>	<ul style="list-style-type: none"> ✓ Ensure that their traditional communities use the natural resources at their disposal on a sustainable basis and in a manner that conserves the environment and maintains the ecosystems for the benefit of all persons in Namibia. ✓ help in facilitating the constructing public infrastructure in their localities, even ensuring their functionality ✓ Ensure the adherence to the terms of agreement dictated by the ECC
<p>Communal conservancy management</p>	<ul style="list-style-type: none"> ✓ Monitoring the exploration progress and its impact on the wildlife, environment and conservancy in

	general
--	---------

The table above is summarized below, with the following parties to aid in overseeing that the overall objective of this document is met;

- ✓ Management Committee
- ✓ Safety Health and Environment Manager
- ✓ Safety and Health Officer
- ✓ Environmental Officer
- ✓ Foreman on duty
- ✓ Personnel on duty/ employees

Table 2: The roles and responsibilities of various stakeholders, environmental indicators and objectives

Objectives	Indicators	Responsibility
To avoid any form of hydrocarbon spills on and around the exploration site	No hydrocarbon spillage or/and remnants of hydrocarbon spillage shall be visible round the project site	SF,PS, ENC
To avoid any form of litter be it paper, metal, plastic and human waste on and around the exploration site	No litter or/and remnants of litter shall be visible around the project site	SF,PS, ENC
To minimize land and soil disturbance	Driving tracks and excavation shall be restricted and only be visible within the project site.	SM, SF, ENC
To protect and conserve fauna and flora within the project area	Minimum levels of habitat disturbance	SM,SF, ENC
To minimize dust generation on site and atmospheric pollution	Emissions/generation particulate content of the dust around the site and gravel roads shall not	SM,SF, ENC

	exceed maximum allowable concentration that may affect human being and animals	
To ensure compliance with statutory requirements	Assurance measures shall be put in place and Periodic inspections aimed at corrective action undertaken, recorded and documented	EC, PP, ENC

Table 3: The implementation of the objectives should be adhered to as indicated in the table

Objectives	Indicators	Responsibility
To avoid any form of hydrocarbon spills on and around the mining site	No hydrocarbon spillage or/and remnants of hydrocarbon spillage shall be visible around the projectsite	Personnel on duty, Foreman on duty
To avoid any form of litter be it paper, metal, plastic and human waste on and around the mining site	No litter or/and remnants of litter shall be visible aroundthe project site	All employees, Environmental Officer, safety, Health and Environment Manager.
To minimize land and soil disturbance	Driving tracks and excavation shall be restricted and only be visible within the project site.	Personnel on duty, Foreman on duty and Environmental Officer.
To protect and conserve fauna and flora within the project area	Minimum levels of habitat disturbance	Safety, Health and Environment Manager, Environmental Officer and personnel on duty
To minimize dust generation on site and atmospheric pollution	Emissions/generation particulate content of the dust around the site and gravel roads shall	Foreman on duty, Environmental Officer and Safety Health and Environment Manager.

	not exceed maximum allowable concentration that may affect human being and animals	
To ensure compliance with statutory requirements	Assurance measures shall be put in place and Periodic inspections aimed at corrective action undertaken, recorded and documented	Environmental Manager, Safety Health and Environment Manager.

The following tables gives the mitigation measures to be undertaken during construction, operation, closure and decommissioning phases with the proponent responsible for implementation.

Table 4: Summary of environmental impacts, mitigation measures and monitoring plan for all project phases

Construction Phase

Environmental impacts	Proposed mitigation measures	Responsibility	Monitoring plan
Air pollution	<ul style="list-style-type: none"> Regular maintenance of vehicles and equipments. Brief workers and contractors. Control speed and operation of construction vehicles. Regular maintenance of vehicles, construction equipments and heavy machineries. Provide workers with dust masks. 	Personnel on duty, Foreman on duty and Environmental Officer	<ul style="list-style-type: none"> Amount of dustproduced. Level of landscaping executed.
Noise pollution	<ul style="list-style-type: none"> All noise should be kept within reasonable levels. Employees and neighbors should be notified of any scheduled 	Foreman on duty, Environmental Officer, Safety Health and Environment	<ul style="list-style-type: none"> Amount of noiseproduced

	<p>unusual noise.</p> <ul style="list-style-type: none"> • Regular maintenance of vehicles, equipment's and heavymachinery. • Workers should be provided with personal hearing protection if working in a noisy environment. 	Manager.	
Solid waste	<ul style="list-style-type: none"> • Littering should be discouraged by having strategically placed bins and refuse skips on site. • Recycling plastic, paper and cans should be encouraged on site • The bins should be emptied on a regular basis by the proponent or an independent contractor. • The site should have containers with bulk storage facilities at convenient points to prevent littering. 	Personnel on duty, Environmental Officer and Safety Health and Environment Manager	<ul style="list-style-type: none"> • Presence of dust bins/waste collection points.
Oil leaks and spills	<ul style="list-style-type: none"> • Contactor should have a sealed designated area where maintenance is carried out to prevent percolation of contaminants. • Oil products should be handled carefully on bounded surfaces; in case it leaks. • Vehicles and equipment should be well maintained to prevent oil leaks. 	Personnel on duty, Foreman on duty Environmental Officer and Safety Health and Environment Manager	<ul style="list-style-type: none"> • Absence of oil spills and leaks on site.
First aid	<ul style="list-style-type: none"> • A well-stocked first aid kit shall 	Safety Health and Environment	<ul style="list-style-type: none"> • Contents of the first aid kits.

ENVIRONMENTAL MANAGEMENT PLAN (EMP) EPL 8759

	be maintained by a qualified personnel.	Manager, Safety and Health Officer.	
Visual	<ul style="list-style-type: none"> Environmental considerations will always be adhered to before clearing roads, trenching and excavation. 	Safety Health and Environment Manager, Environmental Officer	<ul style="list-style-type: none"> Employees to be trained on how to minimize impacts that can easily be identified with the eye.
Archaeological sites	<ul style="list-style-type: none"> Buffer zones will be created around the sites. Adhere to practical guidelines provided by the responsible archaeologist to reduce archaeological impacts of quarrying activities. All archaeological sites to be identified and protected before development commences. 	All personnel on duty, Environmental officer, Safety Health and Environment Manager	<ul style="list-style-type: none"> Register of all archaeological sites identified.
Occupational health and safety	<ul style="list-style-type: none"> Provide personal protective equipment's, train workers on personal safety, and how to handle equipment's and machines. A well-stocked first shall be maintained by qualified personnel. Report any accidents/incidences and treat and compensate affected workers. Provide sufficient 	Safety and Health Officer, Safety Health and Environment Manager	<ul style="list-style-type: none"> Workers using personal protective equipment's. Availability of a well-stocked first aidbox.

ENVIRONMENTAL MANAGEMENT PLAN (EMP) EPL 8759

	<p>and suitable sanitary conveniences which should be kept clean.</p> <p>Clean sanitary facilities.</p>		
Fauna	<ul style="list-style-type: none"> • Some habitat areas such as the river and tunnel outcrops will be avoided wherever possible. • A fauna survey will be conducted to determine the effect of fragmented habitat to game species should the need arise. • No animals shall be killed, capture or harmed in any way. • No food stuff shall be left lying around as this will attract animals which may result in human-animal conflict. 	<p>Personnel on duty, Environmental Officer, Safety Health and Environment Manager</p>	<ul style="list-style-type: none"> • Regular monitoring of any unusual signs of animal habitat.
Alien invasive plants	<ul style="list-style-type: none"> • Ensure vehicles and equipment are clean of invasive plants and seeds. • Eradicating alien plants using area management plan. • Contain neighboring infestations and restrict movement of invasive plants from adjacent lands • Educating everyone on site on types of invasive plants. 	<p>Environmental Officer, Environmental Manager</p>	<ul style="list-style-type: none"> • Regular monitoring of any signs of alien plants.
	<ul style="list-style-type: none"> • Environmental 	<p>Environmental</p>	<ul style="list-style-type: none"> • Warning signs

ENVIRONMENTAL MANAGEMENT PLAN (EMP) EPL 8759

Loss of vegetation	<p>considerations will always be adhered to before clearing roads, trenching and excavating.</p> <ul style="list-style-type: none"> • The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive area will be avoided. • The movement of vehicles will be restricted to certain tracks only. 	Officer, Safety Health and Environment Manager	<p>onsite</p> <ul style="list-style-type: none"> • Restored vegetation
Social Aspect	<ul style="list-style-type: none"> • Job creation • Skills development • Better Infrastructures 	Traditional Authority, Environmental officer	<ul style="list-style-type: none"> •

Operational Phase

Environmental /Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Noise pollution	<ul style="list-style-type: none"> • All noise should be kept within reasonable levels. • Employees and neighbors should be notified of any scheduled unusual noise. • Regular maintenance of vehicles, equipment and heavymachinery. • Workers should be provided with personal hearing protection if working in a noisy 	All employees, Safety Health and Environment Manager Environmental Officer	<ul style="list-style-type: none"> • Amount of noise produced

ENVIRONMENTAL MANAGEMENT PLAN (EMP) EPL 8759

	environment.		
Visual	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads and excavations 	Safety Health and Environment Manager Environmental officer	<ul style="list-style-type: none"> • Employees to be trained on how to minimize visual impacts
Fauna	<ul style="list-style-type: none"> • Some habitat areas will be avoided where possible. • A fauna survey will be conducted to determine the effects of fragmented habitat game species should the need arise. • No animal shall be kept, captured, killed or harmed in any way. • No food stuff will be left lying around as these will attract animals which may result in human-animal conflict. 	All employees, Environmental officer Safety Health and Environment Manager	<ul style="list-style-type: none"> • Regular monitoring of unusual signs of animal habitat.
Alien invasive plants	<ul style="list-style-type: none"> • Ensure debris is properly disposed of. • Ensure vehicles and equipment are clean of invasive plants and seeds. • Contain neighboring infestations and restrict movement of invasive plants from adjacent lands • Educating everyone on site on types of invasive plants. Eradicating alien invasive plants by using an area management plan 	Safety Health and Environment Manager Environmental Officer Foreman and personnel on duty	<ul style="list-style-type: none"> • Regular monitoring of any signs of alien invasive plants
	<ul style="list-style-type: none"> • Environmental 	Safety Health and	<ul style="list-style-type: none"> • Restored

<p>Loss of vegetation</p>	<p>considerations will be adhered to at all times before clearing roads, trenching and excavations.</p> <ul style="list-style-type: none"> • Paths and roads will be aligned to avoid root zones. • Permeable materials will be used wherever possible. • Movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided and restricted to certain tracks only. 	<p>Environment Manager</p>	<p>vegetation</p>
<p>Solid waste</p>	<ul style="list-style-type: none"> • Minimize solid waste generated on site. • Encourage segregation of waste on site • Debris should be collected by waste collection contractor. • Excavated waste should be piled at a designated approved location. 	<p>Safety Health and Environment Manager Environmental Officer All foremen, personnel on duty</p>	<ul style="list-style-type: none"> • Amount of waste onsite. • Availability of dust bins, waste collection point.
<p>Oil leaks and spills</p>	<ul style="list-style-type: none"> • Machinery should be well maintained to prevent oil leaks. • Contractors should have a designated area where maintenance is carried out and should be underlain by impermeable layer. • Workshops should be bounded by concrete 	<p>Environmental Officer, Safety Health and Environment Manager, Foremen, personnel duty</p>	<ul style="list-style-type: none"> • No observed/detected oil spills and leaks onsite
<p>Archaeological sites</p>	<ul style="list-style-type: none"> • Buffer zones will be created around the sites. • Adhere to practical 	<p>Environmental and safety manager</p>	<ul style="list-style-type: none"> • Up to date register of all archaeological sites identified in

	<p>guidelines provided by an archaeologist to reduce archaeological impact of quarrying activities.</p> <ul style="list-style-type: none"> • All archaeological sites to be identified and protected before further quarrying commences. 		the vicinity.
First aid	<ul style="list-style-type: none"> • Qualified personnel shall maintain a well-stocked first aid kit. 	<p>Safety and health Officer, Safety Health and Environment Manager</p>	<ul style="list-style-type: none"> • Contents of the first aid kit.
Fire preparedness	<ul style="list-style-type: none"> • Fire incidence firefighting emergency response plan. • Ensure all firefighting equipments are always available regularly maintained, serviced and inspected. • Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any. 	<p>Health safety officer Safety Health and Environment Manager</p>	<ul style="list-style-type: none"> • Fire signs put up in strategic places. • Availability of well-maintained firefighting equipments.
Environmental health and safety	<ul style="list-style-type: none"> • Train workers on personal safety and disaster prepared 	<p>Safety Health and Environment Manager</p>	<ul style="list-style-type: none"> • Provide sanitary facilities. • Copies of annual audit.

	<p>ness.</p> <ul style="list-style-type: none"> • Provide sufficient and suitable sanitary conveniences which should be kept clean. • Conduct annual health and safety audits. • Report any accidents/incidences, treat and compensate affected workers. • A well-stocked first aid kit shall be maintained by qualified personnel. 		
--	---	--	--

Decommissioning phase

Impact	Proposed mitigation measures	Responsibility	Monitoring plan/Indicator
Noise and air pollution	<ul style="list-style-type: none"> • Workers in noisy section must wear personal hearing protection. • Regular maintenance of vehicles, equipment's, heavy machinery on regular basis. • Workers should be provided with dust mask to wear at all times. • Decommissioning work can only be carried out during the day. 	<p>Health safety and Environment Manager</p> <p>Environmental Officer</p>	<ul style="list-style-type: none"> • Amount of noise and dust generated

<p>Disturbed Physical environment</p>	<ul style="list-style-type: none"> • Undertake a complete environmental restoration programme and introducing appropriate vegetation for ground stabilization. 	<p>Health safety and Environment Manager Environmental Officer</p>	
<p>Solid waste</p>	<ul style="list-style-type: none"> • Contracted waste collection company should collect solid waste. • Excavation waste should be used or backfilled • Open pit must be fenced off to avoid animals and unauthorized people from entering. • Waste dumps must be sloped and lined with topsoil to allow re-germination of grasses 	<p>Health safety and Environment Manager Environmental Officer</p>	<ul style="list-style-type: none"> • Amount of waste on site. • Presence of well-maintained receptacles and central collection point.
<p>Occupational health and safety</p>	<ul style="list-style-type: none"> • Train workers on personal safety and how to handle equipment and machines. • Provide personal protective equipment (PEE). • A well-stocked first aid kits shall be maintained by 	<p>Officer, Health safety and Environment manager</p>	<ul style="list-style-type: none"> • Workers using protective equipment. • Availability of a first aid box.

	qualified personnel. • Demarcate area under decommissioning.		
--	---	--	--

Resource required

The aforementioned Phases will require a great deal of resources from money to mining tools such as Miner tools—tools that miners carry on them, like pickaxe and chisels. Mining PPE—equipment that miners use to stay safe while working. Surface mining equipment—all the tools and mining machines used for surface mining. Underground mining equipment—all the tools and mining machines used for underground mining such as drills, excavators, Dozers, Mining trucks, Shovels and wheel tractor scrapers.

Table 5. The qualitative assessment of air quality impacts for the movement of vehicles on unpaved roads and drilling activities.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	L	M	H
Mitigated	L	L	L	L	L	L

Noise pollution from vehicles, drilling and other activities

Mitigation Measures to be enforced:

- ✓ Drilling will only be conducted during the day, where the drill-site is located close to a dwelling.
- ✓ Workers working near high noise exploration machinery will be provided with ear protection equipment such as earmuffs and earplugs.
- ✓ Reduction of noise from drilling rigs by using downhole drilling
- ✓ No noise generating activities should be undertaken before 8am and after 17:00 hours, over weekends and on public holidays.
- ✓ Employees should be limited to working hours only at most 8 hours per day.
- ✓ In the event that activities continue outside the stipulated hours the contractor will communicate such occurrences to potentially affected communities prior to commencing such activities.

- ✓ Do not allow the use of horns/hooters as a general communication tool, but use it only where necessary as a safety measure.
- ✓ Safe minimum distance from noise generating activities should be introduced.
- ✓ Noise levels should not be equal to or exceed 85dBA for workers working an 8-hour shift (according to ISO 18000).

Table 6. Shows the qualitative assessment of noise.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	L	M	M
Mitigated	L	L	L	L	L	L

Monitoring

Noise monitoring may be carried out for the purposes of establishing the existing ambient noise levels in the area of the proposed project, or for verifying operational phase noise levels. Noise monitoring programs should be designed and conducted by trained specialists. The type of acoustic indices recorded depends on the type of noise being monitored, as established by a noise expert. Continuous monitoring of noise levels should be conducted to make sure the noise levels at the site does not exceed acceptable limits.

Impacts on terrestrial biodiversity Flora/ Vegetation

Mitigation Measures to be enforced: Flora

- ✓ The footprint of the area to be disturbed will be minimized as far as is practically possible.
- ✓ Remove unique fauna and sensitive fauna before commencing with the development activities and relocate to a less sensitive/disturbed site if possible.
- ✓ Disturbed areas must be kept to a minimum. Off-road driving should not be allowed and only existing tracks should be used.
- ✓ Remove unique fauna and sensitive fauna before commencing with the development activities and relocate to a less sensitive/disturbed site if possible.
- ✓ Recommend the planting of local indigenous species of flora as part of the landscaping as these species would require less maintenance than exotic species

and have important ecological functions in terms of carbon sequestration from decomposing materials at the site.

- ✓ Disturbance of marginal vegetation in the mountains should be limited.
- ✓ Where it is clear that certain large species will be destroyed consideration should be given to offering to rescue the individuals involved and relocate them to nearby gardens.
- ✓ Transplant removed trees where possible, or plant new trees in lieu of those that have been removed.
- ✓ The protected and endemic species should be re-introduced in the area.

Mitigation Measures to be enforced: fauna

- ✓ Honour agreements set out in the site-access contracts, specifically relating to the areas utilized for professional hunting. Special consideration should be given to the sensitive hunting season if any.
- ✓ Barriers/barricades confining driving trucks must be erected to avoid stray driving and trampling on habitat. Proper demarcation of the exploration area.
- ✓ Avoid disturbance on invertebrate on-site and along the gravel road stretch.
- ✓ Avoid the creation of multiples roads strips, which could result in the disturbance of breeding sites for various mammals.
- ✓ A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise.
- ✓ Care will be taken to ensure that no litter is lying around as these may end up being ingested by wild animals
- ✓ No workers will be allowed to collect or snare, hunt or otherwise capture any wild animal.
- ✓ No domestic animals will be permitted on the exploration site by means of erecting a perimeter fence; small stock should graze at designated areas.
- ✓ Birds or Nest sites will not be disturbed by any employee, visitor or contractor.
- ✓ If possible, encountered bird kills and nest removal should be registered in a biodiversity data-base and information should be made available to the general public.
- ✓ There should be limited movement of heavy-duty machinery and exploration equipment in the area to avoid interference.

Methods for monitoring:

- ✓ Regular monitoring of any unusual signs of animal habitat.

Table 7. Shows the qualitative impact assessment for biodiversity related to the exploration activities and the impact of personnel on biodiversity.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	L	M	M
Mitigated	L	L	L	L	L	L

Alien invasive plants

Mitigation Measures to be enforced:

- ✓ The site manager will ensure that debris is properly disposed.
- ✓ Vehicle tyres inspections can be carried out although this may not be a practical mitigation measure.
- ✓ The proponent should implement an alien plants awareness campaign to educate and sensitize the employees and the local community on the menace of planting alien vegetation in the area.
- ✓ Eradicating alien plants by using an Area Management Plan.
- ✓ Prevent the introduction of potentially invasive alien ornamental plant species.
- ✓ The proponent should adopt and support the implementation of an annual alien plants clearing campaign.

Table 8. Shows the qualitative impact assessment of alien invasive.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	L	L	L	M	L
Mitigated	L	L	L	L	L	L

Methods for monitoring:

- ✓ Regular monitoring of any unusual signs of alien species.
- ✓ The proponent and local community should establish an alien plant task force to ensure that there is no planting of alien plants species in the area.

Land-use and land contamination

Table 9. Shows the qualitative impact assessment for land use related to the exploration activities.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H-M	L	M	M	M
Mitigated	L	L	L	L	L	L

Actions/Mitigation measures:

- ✓ The footprint of the area to be disturbed will be minimized as far as is practically possible.
- ✓ Areas used as lay down areas are to be raked and/or ploughed to encourage re-vegetation
- ✓ Agree on relevant compensation with landowners where land used for hunting purposes are impacted.

Groundwater and surface water contamination Mitigation Measures to be enforced:

- ✓ Non-toxic and biodegradable drilling lubricant will be used
- ✓ No dumping of waste products of any kind in or in close proximity to surface water bodies and possible recharge areas for groundwater.
- ✓ Wastewater should not be discharged directly into the environment
- ✓ Waste water / contaminated water should be contained for proper disposal.
- ✓ Drip trays must be placed underneath vehicles when not in use to contain all oil that might be leaking from these vehicles.

- ✓ In all areas where there is storage of hazardous substances (i.e. hydrocarbons), there will be containment of spillages on impermeable floors and bund walls that can contain 110% of the volume of the hazardous substances.
- ✓ All refuelling and any maintenance of vehicles will take place on impermeable surfaces.
- ✓ Spill kits will be readily available on site. Employees and/or contractors will be trained to use the spill kits to enable containment and remediation of pollution incidents.
- ✓ Environmental awareness for contractor and employees to be included during inductions
- ✓ Avail a spill response action plan in case of accident and any spills will be contained and cleaned up immediately.
- ✓ Accessibility to spill prevention and response equipment, such equipment should be visible and accessible to all employees at any given time.
- ✓ Spills will be cleaned up immediately to the satisfaction of the Environmental Manager by removing the spillage together with the polluted soil and by disposing of them at a recognized facility as stipulated in the spill response action plan.
- ✓ Designated waste collection tanks should be available on-site and away from waterways, and such isolation should be maintained at all times.
- ✓ Storage of the hazardous substances in a bounded area,

Table 10. Shows the qualitative assessment of surface water and groundwater impacts:

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	M	L	L	H
Mitigated	L	L	L	L	L	L

Fire and explosion hazard Mitigation Measures to be enforced

- ✓ Sufficient fire extinguishers will be installed on every exploration vehicle.
- ✓ A designated area needs to be identified as an assembly area where personnel meet in case of such incident. All employees, contractors and visitors should be made aware of this area through inductions conducted before entering the site.
- ✓ Exploration personnel will be trained on how to use fire extinguishers. A fire and explosive management policy and procedures document for the site should be drafted and review on

a regular basis and every employee should know the content of this document so that they can act accordingly when a fire or an explosion breaks out.

- ✓ Refresher courses on the content of the fire and management policy and procedure document should be given on a regular basis to ensure that the employees are aware and are competent in reacting to such incidents.
- ✓ Sufficient fire extinguishers with sufficient length of hosepipes will be made available on site for fire protection.

Table 11. Shows the qualitative assessment of fire and explosion hazard impacts:

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	L	L	L	L	L
Mitigated	L	L	L	L	L	L

Hazardous waste and materials management

Table 12. Shows the qualitative assessment of hazardous waste and materials impacts:

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	M	L	L
Mitigated	L	L	L	L	L	L

Mitigation Measures to be enforced

- ✓ All chemicals and other hazardous substances must be stored and maintained in accordance with the Hazardous Substances Ordinance (No. 14 of 1974), with all relevant licences and permits to be obtained where applicable.
- ✓ Given the potential harm to human health during handling and use of any of hazardous substances it is essential that all staff be trained with regards to the proper handling of these substances as well as First Aid in the case of spillage or intoxication.

- ✓ Storage areas for all substances should be banded and capable to hold 120% of the total volume of a given substance stored on site.
- ✓ Job safety analysis to identify specific potential occupational hazards and industrial hygiene surveys, as appropriate, to monitor and verify chemical exposure levels, and compare with applicable occupational exposure standards.
- ✓ Hazard communication and training programs to prepare workers to recognize and respond to workplace chemical hazards. Programs should include aspects of hazard identification, safe operating and materials handling procedures, safe work practices, basic emergency procedures, and special hazards unique to their jobs Training should incorporate information from Material Safety Data Sheets for hazardous materials being handled. MSDSs should be readily accessible to employees in their local language.
- ✓ Provision of suitable personal protection equipment (PPE) (footwear, masks, protective clothing and goggles in appropriate areas), emergency eyewash and shower stations, ventilation systems, and sanitary facilities.
- ✓ Monitoring and record-keeping activities, including audit procedures designed to verify and record the effectiveness of prevention and control of exposure to occupational hazards, and maintaining accident and incident investigation reports on file for a period of at least five years.

Solid waste management

Mitigation Measures to be enforced:

- ✓ Waste generated will be handled in accordance with the contract signed with the landowner. This shall include: waste should be separated and recycled / re-used where possible. Where waste management procedures do not exist, a procedure should be developed.
- ✓ Suitable receptacles for waste disposal will be provided at appropriate locations on site. These receptacles will be clearly marked for different waste types.
- ✓ Mandatory waste segregated right at the source of waste generation. The collection of segregated waste would be made from the site and amenity areas.
- ✓ Employees and contractors will be shown the importance of correct waste disposal as well as waste minimization and recycling.
- ✓ Place priority on waste reduction, waste reuse and waste recycling, in that order.
- ✓ Sufficient waste storage bins on site and regular emptying of the waste storage bins.

- ✓ Strictly, no burning of waste on the site or at the disposal site, as it possesses environmental and public health impacts.
- ✓ The collected solid waste should be disposed at registered and approved disposal site agreed upon by both Municipality and the proponent.

Table 13. Shows the qualitative assessment impacts from waste management

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	H	L	M	M	L
Mitigated	L	L	L	L	L	L

Heritage Impacts

Mitigation Measures to be enforced

Adhere to practical guidelines provided by an archeologist on site to reduce archaeological impacts.

- ✓ The site location where archaeological features might be found should be d marked with flag tape and the GPS coordinates should be recorded.
- ✓ Notices/ information boards information will be placed on site.
- ✓ Training employees regarding the protection of these sites.
- ✓ Obtain appropriate clearance or approval from the competent authority.
- ✓ In the event of such finds, all activities must stop, and the project management or contractors should notify the National Heritage Council of Namibia immediately.

Monitoring

- ✓ An archaeologist will inspect any identified archaeological sites before project commencement.

Table 13: Impact evaluation for heritage impact.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	L	M	L	M	L	M
Mitigated	L	L	L	L	L	L

Visual impacts

Mitigation Measures to be enforced

- ✓ The access road to exploration sites must be established in consultation with the headman and usage of existing roads shall be enforced.
- ✓ The design, construction, and location of access to main roads will be in accordance with the requirements laid down by the controlling authority.
- ✓ Negative visual effects can further be prevented through mitigations (i.e. keep existing trees, introduce tall indigenous trees).
- ✓ When exploration activities cease, restore the visual sense of the area to its natural state for instance all excavations, pits are to be backfilled and drillings holes to be capped when no longer in use
- ✓ Care must be taken to ensure that all rehabilitated areas are similar to the immediate environment in terms of visual character, vegetation cover and topography and any negative visual impacts will be rectified to the satisfaction of the environmental consultant.
- ✓ Minimize disturbance to topsoil.
- ✓ Overburden will be placed back into excavation as part of the rehabilitation programme.
- ✓ Restrict off road vehicles and equipment to designated areas.
- ✓ Maintain the small shrubs found on the site and only remove vegetation that has an impact on the development.

- ✓ Land markings, vehicle tracks, and excavations shall be restored to the original landform and, visual state as much as possible.
- ✓ In the case of dual or multiple uses of access roads by other users, arrangements for multiple responsibilities must be made with the other users. If not, the maintenance of access roads will be the responsibility of the holder of the exclusive prospecting licence (EPL).

Table 14. Impact evaluation for visual impacts.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	M	L	M	L	M
Mitigated	L	L	L	L	L	L

Health, safety and security Mitigation Measures to be enforced:

- ✓ All vehicular equipment operators must have valid licences for that particular vehicle class.
- ✓ Ensure that all exploration personnel are properly trained depending on the nature of their work.
- ✓ Provide for a first aid kit and a properly trained person to apply first aid when necessary.
- ✓ A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases as described above.
- ✓ Emergency medical treatment should be available on site. Provide for a first aid kit and a properly trained person to apply first aid when necessary.
- ✓ A wellness program should be initiated to raise awareness on health issues, especially the impact of sexually transmitted diseases, Covid 19, hepatitis etc. Encourage HIV counseling and testing and facilitate access to Antiretroviral (ARV) medication.
- ✓ Prevent diseases spread by biological agents by providing proper toilets and cleaning up facilities, proper waste removal, running water and detergent on site.
- ✓ Clearly demarcate the exploration (area of current activities e.g. drilling site) site boundaries along with signage of “no unauthorized access”.

- ✓ Clearly demarcate dangerous areas and no-go areas on site.
- ✓ Staff and visitors to the exploration site must be fully aware of all health and safety measures and emergency procedures.
- ✓ The contractor must comply with all applicable occupational health and safety requirements.
- ✓ The workforce should be provided with all necessary Personal Protective Equipment where appropriate.
- ✓ The contractor must comply with all applicable occupational health and safety requirements.
- ✓ Implement the use of alcohol detectors.

Methods for monitoring:

- ✓ The proponent whenever necessary will hold public meetings.
- ✓ Regular meeting with the Interested and affected parties, where they can air their concerns should be done four times in a year.
- ✓ The outcome of these meeting should be recorded in a form of a report and the proponent needs to address the issues raised in this meeting.

Table 15: Impact evaluation for health, safety and security.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	L	L	M	L
Mitigated	L	L	L	L	L	L

Socio-economic impacts

Positive Impacts

Employment Creation Enhancement measures:

- ✓ The proponent will introduce training programs (bursary schemes, on the job training etc) in order to boost the supply of local skills

- ✓ It is proposed that local people community members within the area especially the farm owners that are within EPL 8759 and surrounding areas should be considered first for employment. Especially where no specific skills are required.
- ✓ Gender equality considerations during recruitment process.
- ✓ Employment preference will be afforded to previously disadvantaged Namibians.

Generation of revenue

According to the law of Namibia, operating companies are to pay taxes. The proponent will pay tax to the government upon successful exploration activities; hence, this will benefit the nation at large given that money generated from taxes is diverted to the public by the government.

Enhancement measures:

- ✓ Continuous payment of taxes due as regulated in the Namibian laws.

Negative Impacts Socio-economic concerns

- ✓ As the movement of staff and contractors to and from the area increases, the risk of spread of HIV/AIDS and other STDs increases;
- ✓ Increased influx of jobseekers to the area as people come in search of job opportunities during the operational phase of the project. This could lead to potential increase in the unemployed people in the area and the establishment/growth in informal settlements, which could exacerbate security issues due to increased crime rates.
- ✓ Impacts on the size and structure of the population. Increased informal settlement and associated problems;
- ✓ Negative impact on the health and safety of the surrounding community and workers
- ✓ Impact from loss of grazing for domestic livestock in “exclusive use zone”
- ✓ Impacts on cultural and spiritual values.
- ✓ Demographic factors: Attraction of additional population that cannot benefit from the project.
- ✓ Perception of Health and Safety risks associated with exploration.

Mitigation Measures to be enforced:

- ✓ The population change can be mitigated by employing people from the local community and encouraging the contractors to employ local individuals.
- ✓ Safeguard against the development of illegal settlements around the project area.
- ✓ The perception of risks will be mitigated by putting up safety signs wherever possible and ensuring that all employees and visitors to the site undergo a safety induction course.

Methods for monitoring:

- ✓ The proponent whenever necessary will hold public meetings.

Table 16. Shows the qualitative socio economic impacts.

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	M	M	M	M
Mitigated	M	L	M	M	L	L

Actions/Mitigation measures:

- ✓ Honor agreements set out in the site-access contracts
- ✓ Consult and provide feedback regarding activities on the individual properties
- ✓ Provide contact details to a designated person, who will serve as liaison between landowners and the exploration teams
- ✓ Ensure gates are closed after entry and exit.
- ✓ Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm.

Municipal Service Impacts

Proposed exploration project will require provision of the following services:

- ✓ Potable water for domestic purposes
- ✓ Temporary toilets
- ✓ Solid waste management
- ✓ Bulk water and power supply

Compliance and Performance Monitoring, Reporting and corrective actions for the EMP

Monitoring of EMP

Monitoring of the EMP performance for the proposed project by the Contractor emphasizes early detection, reporting, and corrective action. It is divided into three parts, namely:

- ✓ Monitoring of project activities and actions to be undertaken by the Environmental Coordinator (ENC) appointed by the Contractor.
- ✓ The Environmental Coordinator (ENC) shall report all incidents and situations which have the potential of jeopardizing compliance of statutory provisions as well as provisions of this EMP to the Project Proponent.
- ✓ The Environmental Coordinator (ENC) shall take corrective prompt measures, adequate and long-lasting in addressing non-compliance activities or behavior.
- ✓ To ensure compliance of the Contractor ENC to the implementation of the EMP, it is highly recommended that an External Environmental Expert be appointed by the proponent to ensure the implementation of the EMP.
- ✓ The proponent is compelled by the Environmental Management Act of 2007 to submit environmental monitoring reports every 6 months to the DEAF

Inspections and Audits

During the life of the project, performance against the EMP commitments will need to be monitored and corrective action taken where necessary, in order to ensure compliance with the EMP and relevant environ-legal requirements.

Internal Inspections/Audits

The following internal compliance monitoring programme will be implemented:

Project kick-off and close-out audits will be conducted on all contractors. This applies to all phases during exploration. The following inspections will be carried out:

- ✓ Before a contractor begin any work, the applicable phase site manager to ensure that the EMP commitments are included in Contractors' standard operating procedures (SOPs) and method statements will conduct an audit.
 - ✓ Following completion of a Contractors work, a final close-out audit of the contractor's performance against the EMP commitments will be conducted by the applicable phase site manager.
1. Monthly internal EMP performance audits will be conducted during the construction/initial and decommissioning phases.
 2. Ad hoc internal inspections can be implemented by the applicable manager at his/her discretion, or in follow-up to recommendations from previous inspection/audit findings.

External Audits

- ✓ At the end of each project phase, and annually during the exploration phase, an independently conducted audit of EMP performance will be conducted.
- ✓ Specialist monitoring/auditing may be required where specialist expertise are required or in order to respond to grievances or authorities directives.
- ✓ Officials from the DEA may at any time conduct a compliance and/or performance inspection of exploration activities. The proponent will be provided with a written report of the findings of the inspection. These audits assist with the continual improvement of the exploration project and the proponent will use such feedback to help improve its overall operations.

Documentation

Records of all inspections/audits and monitoring reports will be kept in line with legislation. Recommendations on corrective actions will be issued on inspection/audit findings. These will be tracked and closed out upon execution.

Reporting requirements

Environmental compliance reports will be submitted to the Ministry of Environment, Forestry and Tourism on a bi-annual basis.

Environmental management system framework

Environmental Management System (EMS) will be established and implemented by the proponent and their Contractors. This subchapter establishes the framework for the compilation of a project EMS. The applicable manager will maintain a paper based and/or electronic system of all environmental management documentation. These will be divided into policy and performance standards & Enviro legal documentation.

Policy and Performance Standards

A draft environmental policy and associated objective, goals and commitments has been included in the EMP. The project proponent may adapt these as necessary.

Enviro-Legal Documentation

A copy of the approved environmental assessment and EMP documentation will always be available by the proponent. Copies of the Environment Clearance Certificate and all other associated authorizations and permits will also be kept with the exploration team. In addition, a register of the legislation and regulations applicable to the project will be maintained and updated as necessary.

Impact aspect register

A register of all project aspects that could impact the environment, including an assessment of these impacts and relevant management measures, is to be maintained. This Draft EMP identifies the foreseeable project aspects and related potential impacts of the proposed project, and as such forms the basis for the Aspect Impact Register; with the Project Activity. It should however be noted that during the life of the project additional project aspects and related impacts may arise which would need to be captured in the Aspect-Impact Register.

Procedures and Method Statements

In order to affect the commitments contained in this EMP, procedures and method statements will be drafted by the relevant responsible exploration staff and Contractors. These include, but may not be limited:

- ✓ Standard operating procedures for environmental action plan and management programme execution.
- ✓ Incident and emergency response procedures.
- ✓ Auditing, monitoring and reporting procedures, and
- ✓ Method statements for EMP compliance for ad hoc activities not directly addressed in the EMP action plans.

All procedures are to be version controlled and signed off by the applicable manager. In addition, knowledge of procedures by relevant staff responsible for the execution thereof must be demonstrable and training records maintained.

Register of roles and responsibilities

During project planning and risk assessments, relevant roles and responsibilities will be determined. These must be documented in a register of all environmental commitment roles and responsibilities. The register is to include relevant contact details and must be updated as required.

Environmental management schedule

A schedule of environmental management actions is to be maintained by the applicable phase site managers and/or relevant Contractors. A master schedule of all such activities is to be kept up to date by the manager. Scheduled environmental actions can include, but are not limited to:

- ✓ Environmental risk assessment;
- ✓ Environmental management meetings;
- ✓ Soil handling, management and rehabilitation;

- ✓ Waste collection;
- ✓ Incident and emergency response equipment evaluations and maintenance
- ✓ Environmental training;
- ✓ Stakeholder engagement;
- ✓ Environmental inspections and
- ✓ Auditing , monitoring and reporting

Change Management

The environmental management schedule must have a procedure in place for change management. In this regard, updating and revision of environmental documentation, of procedures and method statements, actions plans etc. will be conducted as necessary in order to account for the following scenarios:

- ✓ Changes to standard operating procedures (SOPs);
- ✓ Changes in scope;
- ✓ Ad hoc actions;
- ✓ Changes in project phase; and
- ✓ Changes in responsibilities or roles
- ✓ Changes in project personnel

All documentation will be version controlled and require sign off by the applicable phase site managers.

Environmental code of conduct

The Code of Conduct outlined in this section of the EMP applies to, sub-contractors, visitors, permanent and temporal workers. Therefore, anybody within the boundaries of the project site must adhere to the Environmental Code of Conduct as outlined in this section of the EMP. The Environmental Coordinator ENC will implement on-site environmental guidelines and has the authority to issue warnings as well as discipline any person who transgresses environmental rules and procedures. Persistent transgression of environmental rules will result in a disciplinary

hearing and thereafter continued noncompliance behavior will result in permanent removal from the construction sites.

Site closure and rehabilitation

Rehabilitation is the process of repairing the damage done by exploration activities. Rehabilitation plan has been developed with a main aim of returning disturbed environment close to its pre exploration state. It is also planned to cater for the access road, vehicle tracks around the site, vegetation removal, abandoned exploration drill holes, and restoration of areas covered by sampling stockpile and rock piles. The closure vision for the proposed project is to establish a safe, stable and non-polluting post- prospecting landscape that can facilitate integrated, self-sustaining and value generating opportunities, thereby leave a lasting positive legacy.

Site closure and rehabilitation activities

All waste (such as hazardous and domestic) waste will be transported offsite for disposal in licensed landfills in Spitzkoppe or surrounding towns. Disturbed or/and contaminated areas will be cleaned up, treated where necessary and restored to its pristine state.

- ✓ Demolition of camping structures.
- ✓ Removing of equipment on site.
- ✓ Removal of associated infrastructures such as storage tanks, solar panels and heavy-duty generators.
- ✓ Where access tracks have been developed in cases where there are no roads, these will be rehabilitated and closed as part of normal closure actions in consultation with landowners.
- ✓ Existing secondary roads in the area should be used to prevent damages of the main road.
- ✓ The recovered topsoil and subsoil should be utilized to reconstruct the original soil profile

The rehabilitation actions intended to be undertaken at the end of the life of the proposed exploration activities are described below.

Remediation of Contaminated Areas

All soil, contaminated with hydrocarbons, will be identified, excavated and disposed in accordance with nearest town council disposal requirements at appropriate sites.

- ✓ Removed soils will be managed as determined by the nature and extent of the contamination.
- ✓ All equipment in which chemicals have been stored or transported will be cleaned and disposed of in a suitable disposal facility.

Waste Management

Waste management activities will include:

- ✓ Hazardous waste will be managed handled, classified and disposed.
- ✓ No burring and burying of waste.
- ✓ Nonhazardous substances will be disposed in the nearby landfill sites.
- ✓ It may be necessary to fence temporary salvage yards for security reasons, particularly where these are located close to public roads.

Conclusion

The proponent intends to carryout exploration activities on EPL 8759 for base and rare metals, dimension stone, industrial minerals and precious metals. The proposed exploration activities include desktop studies, geophysical surveys, geochemical survey, geological mapping, trenching, drilling and geochemical sampling as well as laboratory analysis aimed discovering mineral resources of economic interest. Potential positive and negative impacts of the proposed exploration activities on the EPL 8759 were identified, assessed, and mitigation measures are provided in the EMP. These mitigation measures and recommendations provided are deemed sufficient to minimize the identified impacts to acceptable levels. This is to ensure that all potential impacts identified in this study and other impacts that might arise during the exploration activities are properly addressed on time.

The Environmental Management Plan should be used as an on-site reference document during all phases of the proposed project, and auditing should take place in order to ensure compliance with the EMP of the proposed

project. Parties responsible for transgression of the EMP should be held responsible for any rehabilitation that may need to be undertaken. Overall, the severity of potential environmental impacts of the proposed project activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions) will have low probability of occurrence, localized extent, and low magnitude and temporally duration. This report should be viewed as a framework for integrating mitigation measures and applicable legal tools to ensure both compliance and sustainability. It is therefore very important that the proponent provides adequate support for human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned exploration activities.

RECOMMENDATIONS

It is therefore recommended that the mineral exploration activities on the project site be granted an Environmental Clearance Certificate, provided that: All mitigations provided in this EMP should be implemented as stipulated and where required and emphasized, improvement should be effectively put in place. The Proponent and all their workers comply with the legal requirements governing this type of project and its associated activities.

In a summary the following are to be observed to:

- ✓ The proponent should take all the necessary actions to implement the EMP to minimize adverse impacts on the environment.
- ✓ The proponent is to observe all the provisions of the EMP and all conditions of the access agreement to be entered between the proponent and the landowners.
- ✓ The proponent to give advance notices and obtain permission to have access to private property such as private farms from the landowners.
- ✓ The exploration activities should be conducted in line with the EMP, thus implementing the necessary mitigation measures, monitoring and stipulated rehabilitation measures.
- ✓ In a case where portable water is discovered during boreholes drilling operations, the proponent shall support other land users in the area in terms of access to freshwater supply for both human consumption, wildlife and agricultural support as may be requested by the local community / landowners/s. Relevant underground water abstraction permit/s be obtained from the Ministry of Agriculture, Water and Land Reform (MAWLR) and abstraction and monitoring conditions thereof be observed.

References

- 'ACACIA', 2002. Atlas of Namibia Project. Directorate of Environmental Affairs, Ministry of Environment and Tourism.
- Ashmole, I., & Motloun, M. (2008). Mineral: the latest trends in exploration and production technology. In *Proceedings of the International Conference on Surface Mining* (Vol. 5, No. 8).
- Careddu, N., Di Capua, G., & Siotto, G. (2019). Mineral industry should meet the fundamental values of geo ethics. *Resources Policy*, 63, 101468.
- Barnard, P., 1998. *Biological diversity in Namibia - a country study*, Windhoek: Namibian National Biodiversity Task Force.
- Brown, C. & Lawson, J., 1989. *Birds and electricity transmission lines in South West Africa/Namibia*, Windhoek: Madoqua.
- Burke, A., 2003. *Floristic relationship between insel bergs and mountain habitats in the Central Namib.*, s.l.: Dinteria.
- Calcutt, V., 2001. *Introduction to Copper: Mining & Extraction*, s.l.: Copper Development Association.
- Christian, C., 2005. *Spitzkoppe Lodge Proposal Final Report*, Windhoek: Eco Plan (Pty) Ltd.
- Coats Palgrave, K. 1983. *Trees of Southern Africa*. Struik Publishers, Cape Town, RSA.
- Curtis, B. and Mannheimer, C. 2005. *Tree Atlas of Namibia*. National Botanical Research Institute, Windhoek, Namibia.
- Environmental Management Act 7 of 2007
- Griffin, E., 1998. *Species richness and biogeography of non-acarine arachnids in Namibia*, Windhoek: Biodiversity and Conservation.
- Kisters, A., 2008. *Introduction to the Damara Orogen*, Windhoek: Isotope Geology of Namibia.
- Levinson, O., 1983. *Diamonds in the Desert*. Cape Town: Tafel berg.
- Lim, S., 2017. *50,000 years of vegetation and climate change in the Namib Desert* (Doctoral dissertation, Université Montpellier).
- Mannheimer, C. and Curtis, B. (eds) 2009. *Le Roux and Müller's field guide to the trees and shrubs of Namibia*. Macmillan Education Namibia, Windhoek.

- Marshall, T. & Baxter-Brown, R., 1995. Basic principles of alluvial diamond exploration. *Journal of Geochemical Exploration*, pp. 278-293.
- Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T., 2002. *Atlas of Namibia: a portrait of the land and its people*, Cape Town: David Philip.
- Miller, R.M. 1983. The Pan-African Damara Orogen of S.W.A./Namibia. *Special Publication of the Geological Society of South Africa*, 11, 431-515.
- Miller R. McG. (1992). Mineral resources of Namibia. Geological Survey of Namibia.
- Miller, R.M., 2008. Neoproterozoic and early Palaeozoic rocks of the Damara Orogen. In: Miller, R.M. (Ed.). *The Geology of Namibia*. Geological Survey of Namibia, Windhoek vol. 2, pp. 13-1–13-410. References.
- Monadjem, A., Taylor, P.J., F.P.D. Cotterill and M.C. Schoeman. 2010. Bats of southern and central Africa. Wits University press, Johannesburg, RSA.
- Müller, M.A.N. 2007. *Grasses of Namibia*. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.
- Schneider, G. & Seeger, K., 1992. Copper. In: s.l.: *The Mineral Resources of Namibia*, pp. 2.3, 1-172.
- Skinner, J.D. and Chimimba, C.T. 2005. *The mammals of the southern African sub region*. Cambridge University Press, Cape Town, RSA.
- Taylor, P.J. 2000. *Bats of southern Africa*. University of Natal Press, RSA.
- Van Oudtshoorn, F. 1999. *Guide to grasses of southern Africa*. Briza Publications, Pretoria, South Africa.