

A SCOPING REPORT ON THE ENVIRONMENTAL IMPACT ASSESSMENT FOR COPPER MINING ACTIVITIES ON A MINING LICENCE 249, KUNENE REGION

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ENVIRONMENTAL ASSESSMENT FOR COPPER MINING ACTIVITIES IN THE EHONGO AREA, KUNENE REGION

EXECUTIVE SUMMARY

1. Introduction

1.1 Overview

The proponent, Shiloam Mining and Investments (Pty) Ltd, applied for a mining licence (ML 249) with the Ministry of Mines and Energy. The proponent intends to mine copper ore from the mining licence.

1.2 Location

The mining licence is located 57 km northeast of Opuwo, along the C35 road.

1.3 Environmental Assessment Requirements

The Environmental Regulations procedure (GN 30 of 2012) stipulates that no mining and mining activities may be undertaken without an environmental clearance certificate. As such, an environmental clearance certificate must be applied for in accordance with regulation 6 of the 2012 environmental regulations. It is imperative that the environmental proponent must conduct a public consultation process in accordance with regulation 21 of the 2012 environmental procedure, produce an environmental scoping report and submit an Environmental Management Plan for the proposed mining activities.

1.4 Project Alternatives

An alternative to the proposed mining activity would be to allocate the land-usage to other income generating activities tourism activities. The proposed project will strictly employ locals from nearby towns and settlements.

ENVIRONMENTAL ASSESSMENT FOR COPPER MINING ACTIVITIES IN THE EHONGO AREA, KUNENE REGION

FINAL SCOPING REPORT

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1. Introduction

1.1 Project Background

The proponent, Shiloam Mining and Investments (Pty) Ltd, applied for a mining licence, with the Ministry of Mines and Energy. The proponent intends to mine copper ore from the mining licence.

1.1.1 Mineral Licence Tenure

The mining licence was applied for by Shiloam Mining and Investments (Pty) Ltd.

The size of the mining licence is **2938 hectares**. The mining licence applied for is applicable for Base and Rare Metals and Precious Metals commodities.

The coordinates for the centre of the mining licence is 14°20'36.378"E and 17°50'35.017"S.



14°20'0"E

17°51'30"S

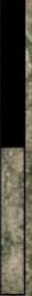
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Legend

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14°20'0"E

Shutterstock.com



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Kilometers

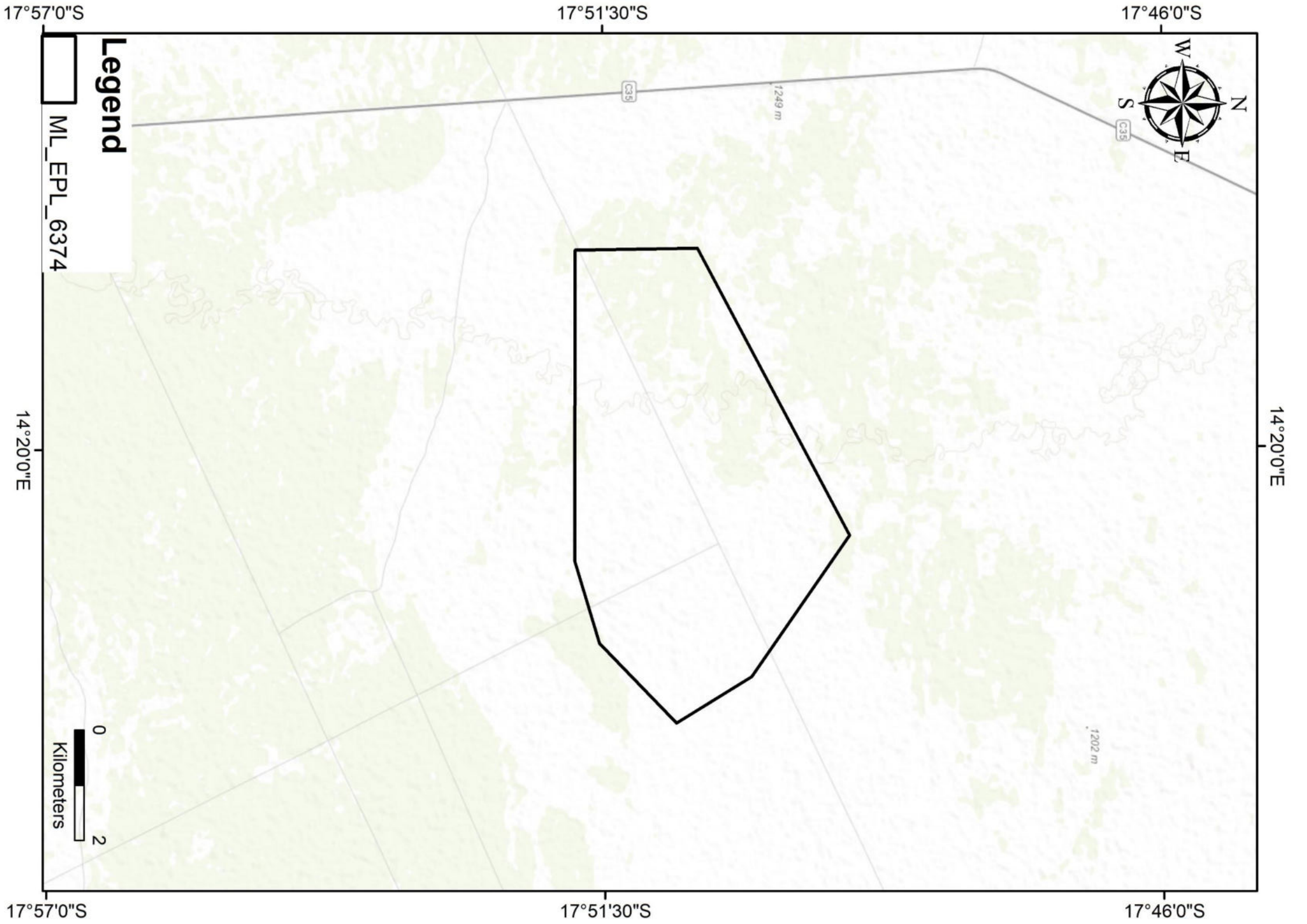
1.1.2 Proponent of the Proposed Project

The Mining licence were applied for by Shiloam Mining and Investments (Pty) Ltd. The proponent is focused on the acquisition and development of Base and Rare metals, and Precious Metals projects in Namibia.

Licence Holder	Postal Address	Email Address	Contact
Shiloam Mining and Investments (Pty) Ltd			264811500800

1.1.3 Environmental Consultant

Impala Environmental Consulting cc was appointed by the proponent to undertake an Environmental Assessment (EA) and Environmental Management Plan (EMP) for the mineral exploration project. Impala does not have any interest, be it business, financial, personal or other, in the proposed activity, application or appeal, other than fair remuneration for work performed on this project. The public participation process and report writing was overseen by Mr. Ndaluka Amutenya as the EAP. CV's of various role players are annexed to the appendix section of this report.



1.2 Project Location

The mining licence is located 57 km northeast of Opuwo, along the C35 road.

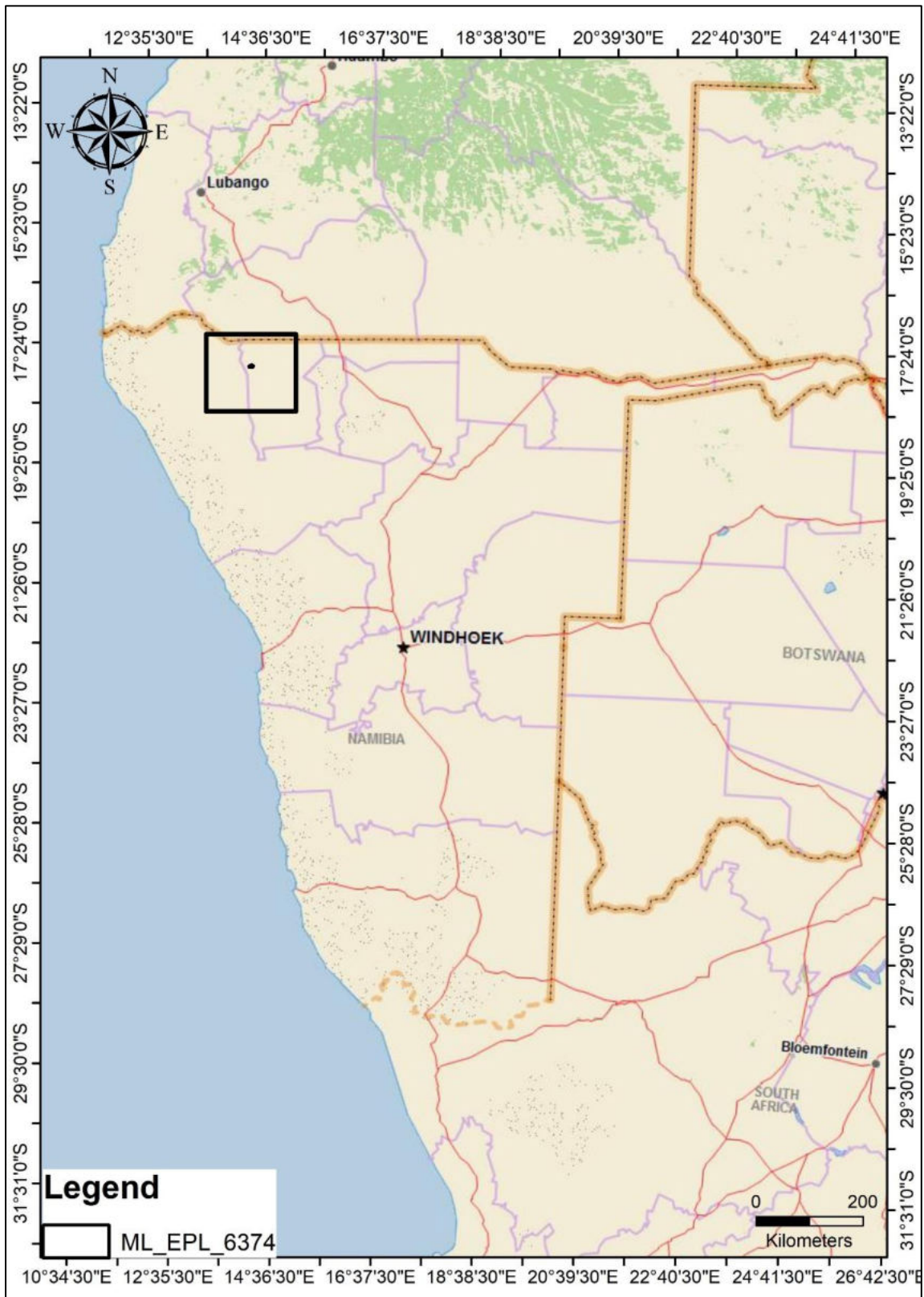


Figure 3 Locality map of the Mining licence area

1.3 Infrastructure and Services

1.3.1 Electricity

At this stage, electricity requirements for the project are minimal. The bulk of the power supply to the exploration site will be sourced from the proponent's own generator or from a nearby power grid, in consultation with NORED. The power requirements for the proposed project will be minimal as power will only be required for the following activities:

- Emergency lighting.
- Powering machinery during the mining process.
- Power supply for temporary office block or container if necessary.

1.3.2 Water Supply

The water requirements for the project are minimal. Water will be brought on site and utilised whenever necessary. The water will mostly be used for general consumption and cleaning.

1.3.3 Refuse and Waste Removal

The proponent will negotiate directly with all suppliers of consumables such as grease, oil etc. to remove these materials for disposal once they have been used and need to be discarded. The proponent will provide adequate temporary sanitary facilities and such facilities must be maintained in a hygienic condition. Sewerage must be disposed in a manner not polluting the environment. The proponent will remove all refuse pertaining to the proponent's activities, domestic or otherwise, from the property. Domestic waste will be disposed of at a waste dump in Windhoek. The Miner will undertake environmental rehabilitation, both during and at the conclusion of the mining operations. Unusable oil will be collected in drums and sold to dealers for recycling.

1.3.4 IT Systems and Communication

Provision will be made for two-way radios to enable the drill rig operators and the on-site staff to communicate effectively.

1.3.5 Security and Fencing

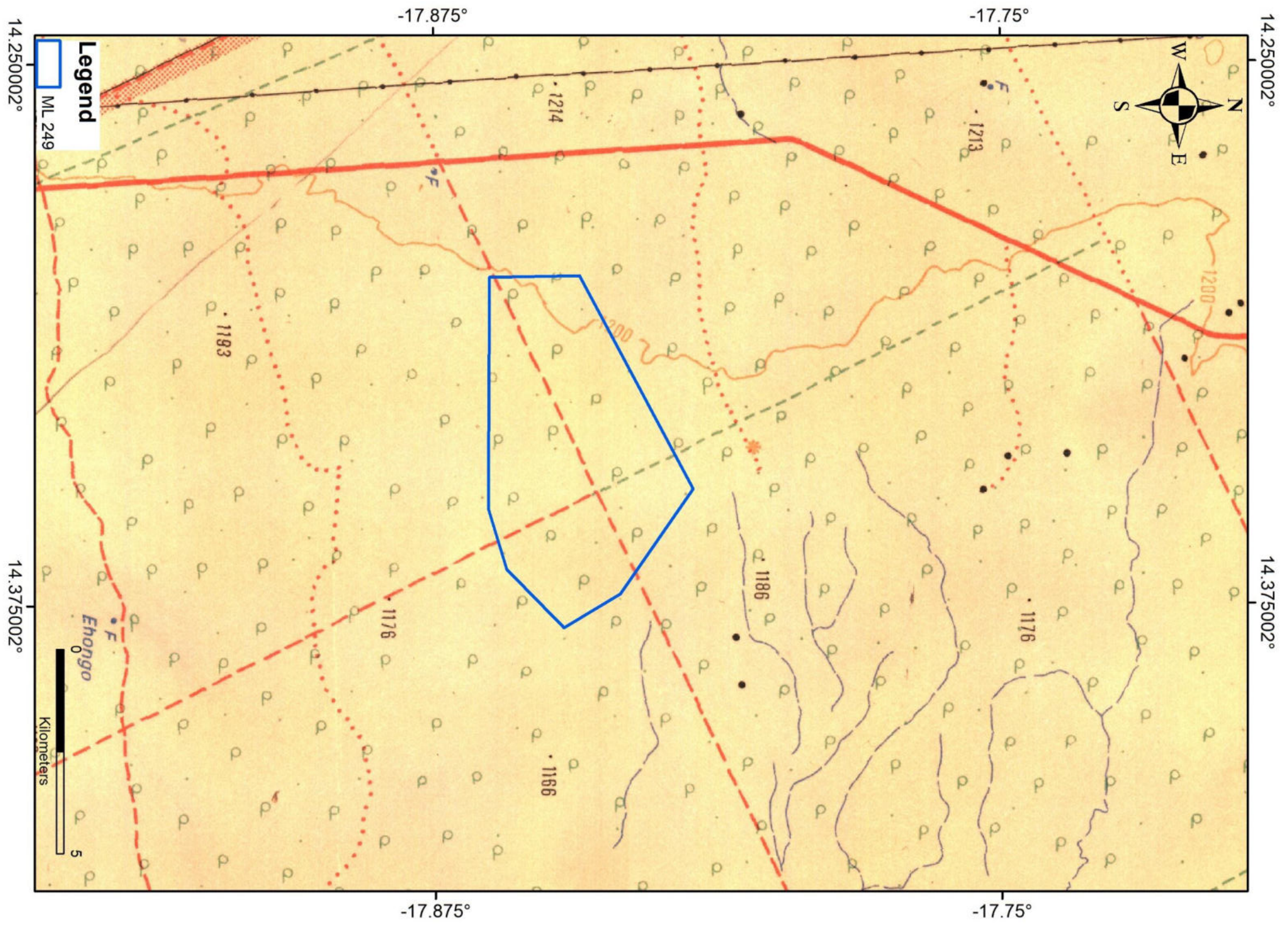
No provision has been made for fencing although strict access to and from the mining site will be facilitated by personnel.

1.3.6 Buildings

At this stage, no mining camp will be set up and so provision will be made for prefabricated containers.

1.3.7 Roads

The access roads to the mining site are quite good. The mining claim sites will be accessed using farm roads that lead from the B1 main road.



1.3.8 Mobile Equipment

The proponent's vehicle fleet will be optimised during the next project phase. Provision will be made for a Haul truck, 5 off-road vehicles, an excavator and a front-end loader. Other tools include a genset, wire saws, an electric compressor and a water jacking plant.

1.3.9 Fuel Distribution, storage and supply

During the drilling phase, diesel will be delivered to the by road transport and offloaded into the vehicles by offloading pumps.

1.3.10 Storage of Lubrication and consumables

Consumables and lubricants will be stored in a designated area within a container. These substances will only be used for mechanical purposes and are assumed to be non-hazardous. Diesel will be delivered to a small temporary on-site fuel storage facility by road transport and offloaded into the storage tanks by offloading pumps.

1.3.11 Fire Fighting Provision

Portable fire-extinguishers will be fitted, as required, in vehicles and, as well as in the mobile containers where possible.

1.4 Environmental Impact Assessment Requirements

The Environmental Regulations procedure (GN 30 of 2012) stipulates that no mining activities may be undertaken without an environmental clearance certificate. As such, an environmental clearance certificate must be applied for in accordance with regulation 6 of the 2012 environmental regulations. It is imperative that the environmental proponent must conduct a public consultation process in accordance with regulation 21 of the 2012 environmental procedure, produce an environmental scoping report and submit an Environmental Management Plan for the proposed mining activities.

1.5 Purpose of the Scoping Report

The scoping report is prepared for the Environmental Impact Assessment for copper mining on mining licence which is located 40 km northeast of Opuwo, along the C35

road. Environmental scoping is a critical step in the preparation of an EIA for the proposed mining activities. The scoping process identifies the issues that are likely to be most important during the EIA and eliminates those that are of little concern. The scoping process shall be concluded with the establishment of terms of reference for the preparation of an EIA, as set out by the Ministry of Environment and tourism. The purpose of this scoping report is to:

- Identify any important environmental issues to be considered before commencing with mining activities on the proposed mining sites.
- To identify appropriate time and space boundaries of the EIA study.
- To identify information required for decision-making.

As such, the key objectives of this scoping study are to:

- Inform the public about the proposed mining activities.
- Identify the main stakeholders, their comments and concerns.
- Define reasonable and practical alternatives to the proposal.
- To establish the terms of reference for an EIA study.

1.6 Terms of Reference

The approach and methodology taken was guided by the Environmental Regulations of 2012 and the Terms of Reference (ToR) which were provided by the proponent:

- Identify all legislation and guidelines that have reference to the proposed project.
- Identify existing environmental (both bio-physical and socio-economic) conditions of the area in order to determine their environmental sensitivity.
- Inform Interested and Affected Parties (I&APs) and relevant authorities of the details of the proposed development and provide them with a reasonable opportunity to participate during the process.
- Consider the potential environmental and social impacts of the development and assess the significance of the identified impacts.

- Compile a Scoping Report detailing all identified issues and possible impacts, stipulating the way forward and identifying specialist investigations, if required.
- Outline management and mitigation measures in an Environmental Management Plan (EMP) to minimize and/or mitigate potentially negative impacts.
- Submit the final scoping report to the competent authority and the Environmental Commissioner.

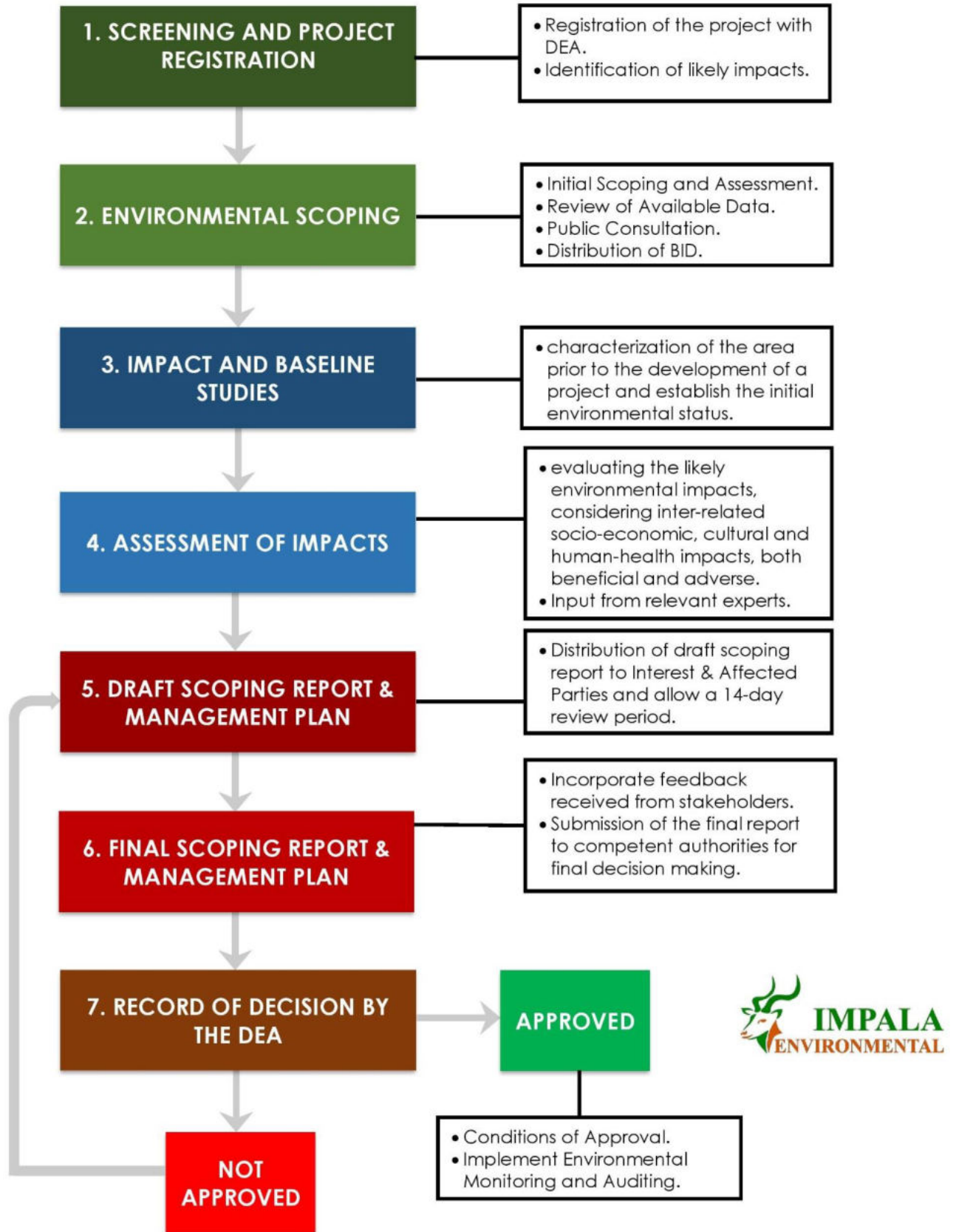


Figure 4 Flowchart of the Environmental Impact Assessment process followed in Namibia.

1.6.1 Environmental Assessment Approach and Methodology

Environmental assessment process in Namibia is governed by the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) and in line with the provisions of the Cabinet approved Environmental Assessment Policy for Sustainable Development and Environmental Conservation of 1995.

This report has taken into consideration all the requirements for preparation of all the supporting documents and application for an Environmental Clearance Certificate and lodgement of such application to the Environmental Commissioner (EC), Department of Environmental Affairs (DEA) in the Ministry of Environment and Tourism (MET).

The purpose of the Scoping Phase was to communicate the scope of the proposed project to Interested and Affected Parties (I&APs), to consider project alternatives, to identify the environmental (and social) aspects and potential impacts for further investigation and assessment, and to develop the terms of reference for specialist studies to be conducted in the Impact Assessment Phase if necessary. The steps undertaken during the Scoping Phase are summarised below.

1.6.1.1 Project Initiation and Screening

The project was registered on the online ECC portal (eia.met.gov.na) in order to provide notification of the commencement of the EIA process and to obtain clarity on the process to be followed.

1.6.1.2 Initial Scoping Public Participation Process

The objective of the public scoping process was to ensure that interested and affected parties (I&APs) were notified about the proposed project, given a reasonable opportunity to register on the project database and to provide initial comments. Steps that were undertaken during this phase are summarised below:

- **I&AP identification:** A preliminary I&AP database was compiled using the farmer's contact details that were obtained from the Ministry of Lands and contact details of other interested and affected parties that were provided by the proponent. Additional I&AP's were added to the database based on

responses to the advertisements and notification letters, as well as attendees to the various meetings.

- **Notification letter and Background Information Document (BID):** A notification letter and Background Information Document was distributed for review and comment for a period of 3-4 weeks after commencement of the project.
- **Advertisements and site notice:** Advertisements announcing the proposed project, the availability of the BID, public meetings and the I&AP registration / comment period were placed in two widely distributed newspapers for two consecutive weeks. Site notices were placed on the boundaries of farm fences and on the notice boards of the Regional Council.

Over and above the issues raised were incorporated into the scoping report. These submissions were collated and responded to as indicated in the public participation section of the scoping report.

1.6.1.3 Compilation and Review of Draft Scoping Report (DSR)

The DSR was prepared in compliance with Section 8 of the EIA Regulations of 2012 and incorporated with comments received during the initial Public Participation Process. The DSR was distributed for a 14-day review and comment period.

1.6.1.4 Final Scoping Report and Completion of the Scoping Phase

The Final Scoping Report (FSR) summarises the following: the legal and policy framework; approach to the EIA and process methodology; the project's need and desirability; proposed project activities; key characteristics of the receiving environment; and key issues of concern that will be further investigated and assessed in the next phase of the EIA.

The FSR complies with Section 8 of the EIA Regulations 2012. All written submissions received during the DSR review and comment period will be collated and responded to. The FSR was submitted to the competent authority. In terms of Section 32 of the Environmental Management Act, 2007 (No. 7 of 2007), the competent authority is then required to make a recommendation on the acceptance or rejection of the report to Ministry of Environment and Tourism (MET): Department of Environmental Affairs (DEA), who will make the final decision.

1.6.2 List of Specialist Studies Undertaken

Section 9(a) of the Environmental Regulations of 2012 requires a disclosure of all the tasks to be undertaken as part of the assessment process, including any specialist to be included if necessary.

The following specialist studies were undertaken:

- Biodiversity (Flora, Fauna and Avifauna).
- Hydrogeology/Groundwater
- Social Impact Assessment
- Archaeology
- Air Quality
- Noise

1.7 Need and Desirability

1.7.1 Need of the Mining Project

Mining companies play an important role in the development of a country's mineral resources. When minerals are mined, the company selling the product must pay a royalty to the government). The royalties are set by the government at a level that will encourage others to risk their capital in finding and developing these minerals, rather than the government risking taxpayer's money. This way the country can share in benefit of mineral resources without risking funds required for key everyday services to the community.

Namibia has a long tradition of mining. In 2018, mining contributed 14% of GDP and expanded 28%. In 2019, the mining industry contributed over 300 million dollars to government revenue. The whole industry contributed around 2.2 billion dollars to the national economy in the same period. However, a drop in diamond and uranium production caused a contraction of 11,1%. Lower mineral commodity prices led to the declining expenditure on exploration. In 2019, the mining industry paid over 300 million dollars in wages and salaries and provided 16 324 direct jobs with 9 027 permanent employees. Temporary jobs figured out 800, while 6 515 were contractor jobs.

The mining project may assist in helping Namibia attain some of the goals set out in National Development Plans such as the Fifth National Development Plan (NDP5) and

the Harambee Prosperity Plan (HPP). During the mining phase, the project will provide employment to at least 100 people from the surrounding towns and settlements. A mine can significantly contribute to social-economic development around the surrounding community.

1.7.2 Alternatives

During the application of the mining licence, no alternative sites were considered. The proposed mining site has proved to host significant quantities of copper ore.

1.7.2.1 Mining Method Alternatives

Basically, small-scale copper mining involves entails removing the vegetation, top soil, and rock (called overburden materials) above the mineral deposit, removing the deposit, and reclaiming the affected land for postmining land use.

1.7.2.2 No-Go Alternatives

The no-go alternative will mean that the current land activities such as farming and important vegetation species will not be disturbed, that is, there will not be disturbance of the flora and fauna.

No-go alternative will result in the non-mining of minerals and bring benefications to the receiving environment. However, the no-go alternative is not considered since it will lead to negative socio-economic impacts.

2 Summary of applicable legislation

All mineral rights, related to mining activities in Namibia, are regulated by the Ministry of Mines and Energy whereas the environmental regulations are regulated by the Ministry of Environment and Tourism. The acts that affect the implementation, operation and management of mining activities in Namibia are shown below.

2.1 Environmental Management Act of 2007

Line Ministry: Ministry of Environment and Tourism

The regulations that accompany this act lists several activities that may not be undertaken without an environmental clearance certificate issued in terms of the Act. The act further states that any clearance certificate issued before the commencement of the act (6 February 2012) remains in force for one year. If a person wishes to continue with activities covered by the act, he or she must apply for a new certificate in terms of the Environmental Management Act.

2.2 The Minerals Prospecting and Mining Act of 1992

Line Ministry: Ministry of Mines and Energy

The Minerals Prospecting and Mining Act No.33 of 1992 approves and regulates mineral rights in relation to exploration, reconnaissance, prospecting, small scale mining, mineral exploration, large-scale mining and transfers of mineral licences.

2.3 Water Resources Management Act of 2004

Line Ministry: Ministry of Agriculture, Water and Forestry

The act provides for the management, protection, development, usage and conservation of water resources; to provide for the regulation and monitoring of water resources and to provide for incidental matters.

2.4 Nature conservation ordinance, ordinance No. 4 of 1975

Line Ministry: Ministry of Environment and Tourism

The Nature Ordinance 4 of 1975 covers game parks and nature reserves, the hunting and protection of wild animals (including reptiles and wild birds), problem animals, fish, and the protection of indigenous plants. It also establishes a nature conservation

board. The basic set of regulations under the ordinance is contained in GN 240/1976 (OG 3556). The topics covered in the regulations include tariffs (game parks), regulations relating to game parks, swimming baths, use of boats in game parks, inland fisheries, keeping game and other wild animals in capturing. In addition, the ordinance also regulates game dealers, game skins, protected plants, birds kept in cages, trophy hunting of hunt-able game, hunting at night, export of game and game meat, sea birds, private game parks, nature reserves, regulations of wildlife associations and registers for coyote getters.

2.5 National Heritage Act, 2004 (Act No. 27 of 2004)

Line Ministry/Body: National Heritage Council

The National Heritage Act provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects; to establish a National Heritage Council; to establish a National Heritage Register; and to provide for incidental matters.

2.6 Petroleum Products and Energy Act No. 13 of 1990

Line Ministry/Body: Ministry of Mines and Energy

The act regulates the importation and usage of petroleum products. The act reads as “To provide measures for the saving of petroleum products and an economy in the cost of the distribution thereof, and for the maintenance of a price thereof; for control of the furnishing of certain information regarding petroleum products; and for the rendering of services of a particular kind, or services of a particular standard; in connection with motor vehicles; for the establishment of the National Energy Fund and for the utilization thereof; for the establishment of the National Energy Council and the functions thereof; for the imposition of levies on fuel; and to provide for matters incidental thereof”.

2.7 Forest Act, No. 12 of 2001

Line Ministry/Body: Ministry of Agriculture, Water and Forestry

The act regulates the cutting down of trees and reads as follows “To provide for the

establishment of a Forestry Council and the appointment of certain officials; to consolidate the laws relating to the management and use of forests and forest produce; to provide for the protection of the environment and control and management of forest trees; to repeal the preservation of Bees and Honey proclamation 1923, preservation of Trees and Forests Ordinance, 1952 and the Forest Act, 1968; and to deal with incidental matters”.

The constitution defines the function of the Ombudsman and commits the government to sustainable utilization of Namibia’s natural resources for the benefit of all Namibians and describes the duty to investigate complaints concerning the over-utilization of living natural resources for the benefit of all Namibians and describes the duties to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and the destruction of ecosystem and failure to protect the beauty and character of Namibia. Article 95 states that *“the state shall actively promote and maintain the welfare of the people by adopting; inter-alia policies aimed at maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future”*.

2.8 Atmospheric Pollution Prevention Ordinance 11 of 1976

Line Ministry/Body: Ministry of Health and Social Services

This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, with the exception of East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.

2.9 Hazardous Substance Ordinance, No. 14 of 1974

Line Ministry/Body: Ministry of Safety and Security

The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage and handling.

2.10 Namibian Water Corporation (Act 12 of 1997)

Line Ministry/Body: Namibian Water Corporation

The act caters for water rehabilitation of prospecting and mining areas, environmental impact assessments and for minimising or preventing pollution.

2.11 Public and Environmental Health Act, 2015

Line Ministry/Body: Ministry of Health and Social Services

provide a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters.

2.12 Agricultural (Commercial) Land Reform Act 6 of 1995

Line Ministry/Body: Ministry of Lands, Resettlement and Rehabilitation

To provide for the acquisition of agricultural land by the State for the purposes of land reform and for the allocation of such land to Namibian citizens who do not own or otherwise have the use of any or of adequate agricultural land, and foremost to those Namibian citizens who have been socially, economically or educationally disadvantaged by past discriminatory laws or practices; to vest in the State a preferent right to purchase agricultural land for the purposes of the Act; to provide for the compulsory acquisition of certain agricultural land by the State for the purposes of the Act; to regulate the acquisition of agricultural land by foreign nationals; to establish a Lands Tribunal and determine its jurisdiction; and to provide for matters connected therewith.

3 Description of Proposed Copper Mining Project

3.1 Introduction

various earth-moving equipment including shovels, dozers, hauling trucks, and loaders are used to remove and transport the ore. However, the first step is to loosen the rock in the ore body so that it can be moved and processed. Blasting and grinding equipment are used to accomplish this task. Open pit mining is a technique used to extract copper ore near the earth's surface. Open pit mining is the most widely used

technique of mining copper today. It is accomplished by creating and using benches or terraces to gradually reach deeper under the earth's surface. Open pit mining is defined as the method of extracting any near surface ore deposit using one or more horizontal benches to extract the ore while dumping overburden and tailings (waste) at a specified disposal site outside the final pit boundary. Open pit mining is used for the extraction of both metallic and non-metallic ores. Open pit mining is considered different from quarrying in the sense that it selectively extracts ore rather than an aggregate or a dimensional stone product.

Open pit mining is applied to disseminated ore bodies or steeply dipping veins or seams where the mining advance is toward increasing depths. Backfilling usually occurs until the pit is completed; even then, the high cost of filling these pits with all the waste removed at the end of the mine life would seriously risk the project's economics. Few large open pits in the world could support such a costly obstacle. Open pit method is usually nonselective, and it includes all high and low-grade zones; whereas mining rate is nearly over 20,000 tons mined per day and often necessitates a large capital investment but generally results in high productivity, low operating cost, and good safety conditions. The main purpose of this section is to discuss the general features of open pit mining, ore body characteristics and configurations, stripping ratios and stripping overburden methods, mine elements and parameters, open pit operation cycle, pit slope angle, stability of mine slopes, types of highwall failures, mine closure, and reclamation. The chapter will also discuss different variants of surface mining methods including opencast mining, mountainous mining, and artisan mining.

3.3 Labour Requirements

The proponent intends to employ more than 55 personnel, including 10 management staff for the first phase of the project. The employees will be sourced from the local community including people from Opuwo. All employees will undergo a safety induction, first aid training course and wildlife awareness program. The Labour Act of 2007 will be adhered to at all times.

3.4 Waste Dumps

In choosing a waste dumpsite, the following aspects will be strongly considered by the explorer:

- Topography
- Land-use in the area
- The presence of any hazardous geological structures
- Groundwater considerations
- The prevailing wind direction in the area
- Visual impacts that the waste dump might have
- Presence of surface water in the vicinity of the area
- Presence of sensitive ecological areas

All waste will be transported and disposed out of the area.

4 Description of the Current Environment

4.1 Introduction

This section aims to document the present state of the environment, the likely impact of changes being planned and the regular monitoring to attempt to detect changes in the environment. As such, this area represents a high fauna diversity.

Namibia has four very large and arid regions which set them apart in various ways from the rest of the country; Kunene and Erongo region in the west and Karas and Erongo in the south (Mendelsohn, et al., 2002). Kunene Region occupies the north-west corner of Namibia. The Skeleton Coast Park forms its entire western boundary with the Atlantic Ocean. The Kunene River with its Epupa Falls forms an international boundary with Angola to the north. Nationally, Kunene is bordered by Omusati Region and the western boundary of Etosha National Park. In the south it forms the southern

boundary of most of Etosha National Park and borders Erongo and Erongo regions. The region is home to the Skeleton Coast Park and many conservancies. Erongo is one of the central regions in Namibia with a size of 105,185 square kilometers, with vegetation ranging from open savanna around Opuwo, to lush vegetation and massive bright red sandstone cliffs.

There is generally an absence of fences in most parts of the Kunene Region. This makes livestock farming easier which means that both wild and domestic animals can move widely in many places, migrating from areas of poor grazing to other places with more abundant pastures.

4.2 Climatic Conditions

4.2.1 Temperature

In the mineral exploration area, November is the warmest month with an average temperature of 29°C at noon. June is the coldest month with an average temperature of 20°C at night. Opuwo, which is in the vicinity of the project area, has distinct temperature seasons, the temperature varies during the year.

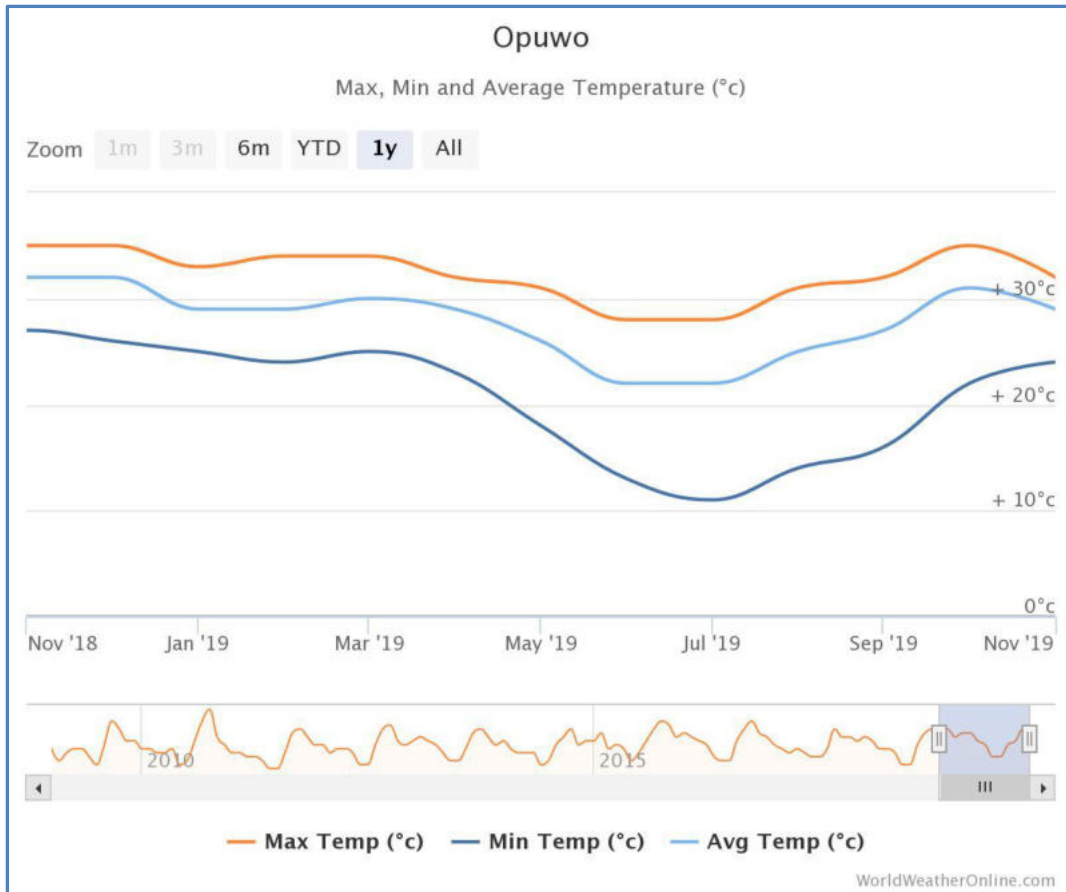


Figure 5 A graph showing the temperature patterns in Opuwo, from www.worldweatheronline.com

In winter, temperatures can get to below degrees centigrade. Overall, winters are mild in temperature, with coldest month most often being June.

4.2.2 Precipitation

In the mineral exploration area, the highest rainfall is usually experienced in January which may reach 132 mm with average rainfall days. In March months, rainfall may reach about 40 mm with average rainfall days. The graph below shows the rainfall patterns in the area.

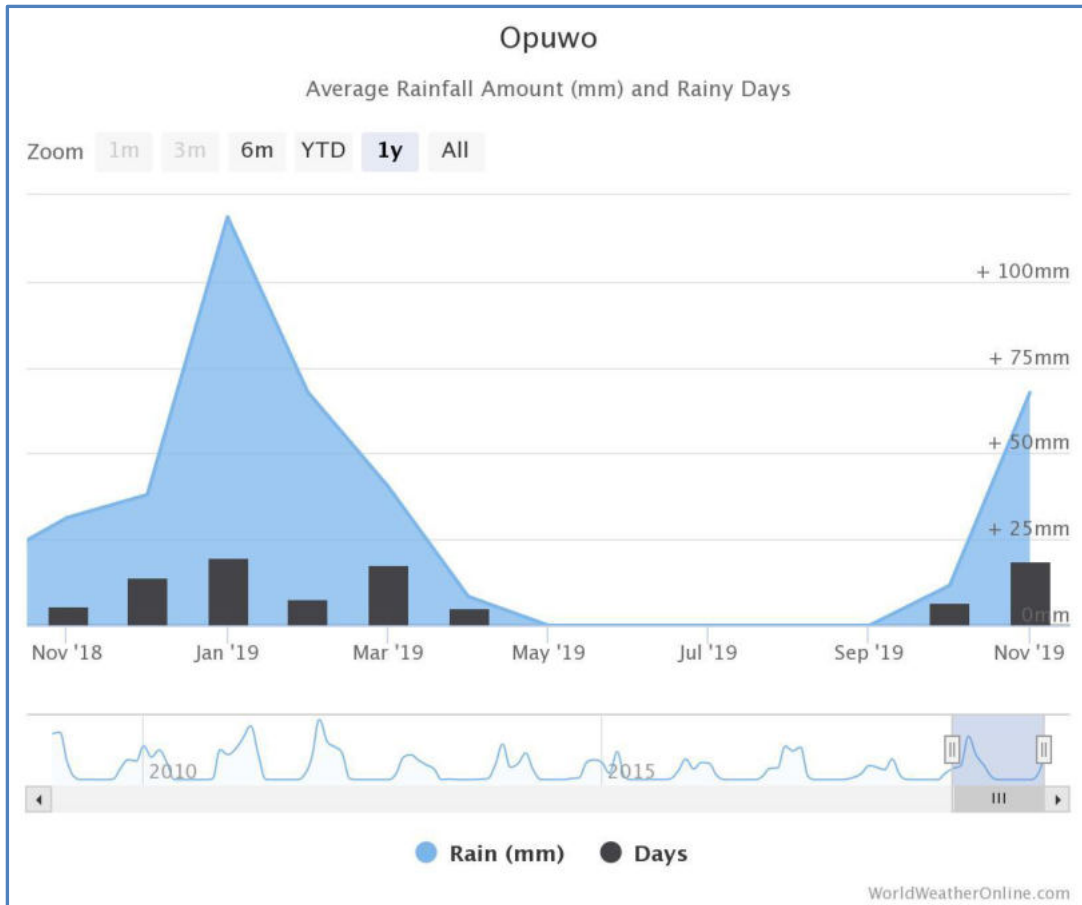
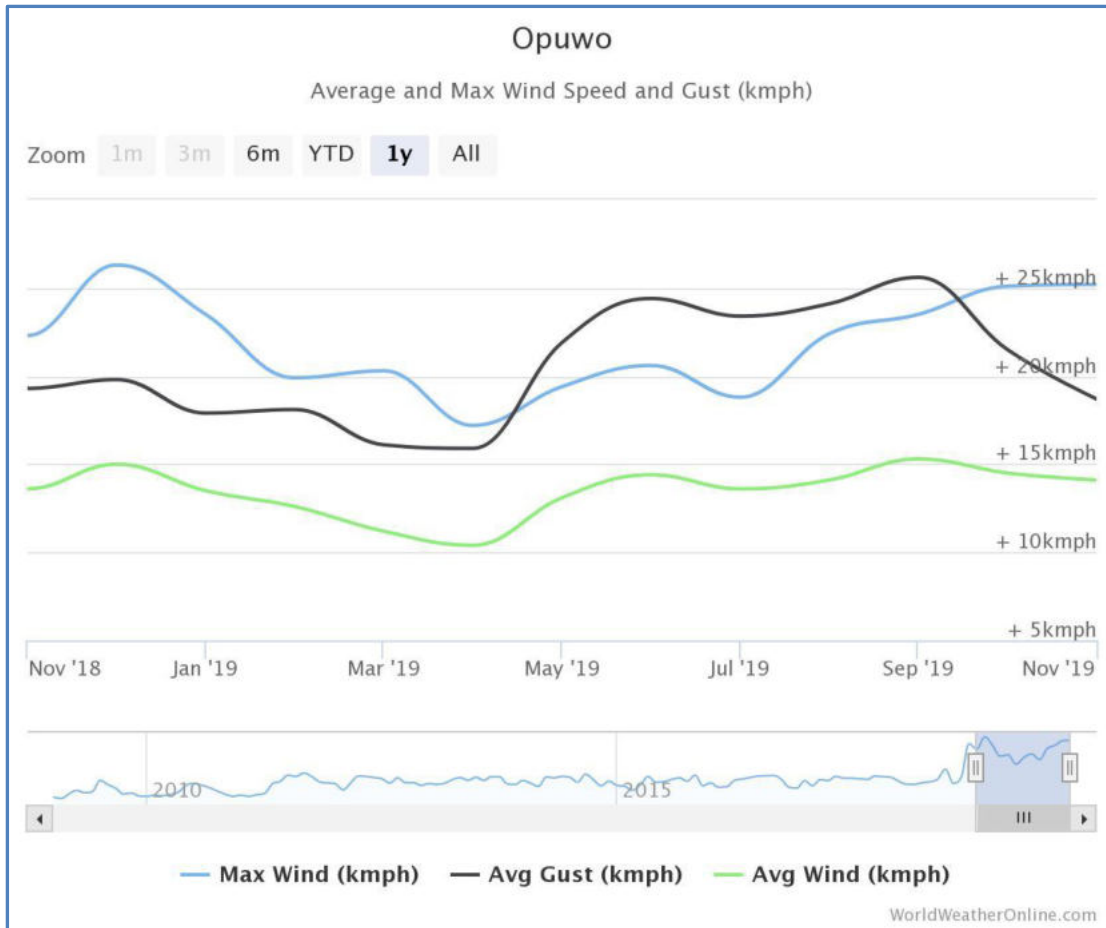


Figure 6 A graph showing rainfall patterns in Opuwo, from www.worldweatheronline.com

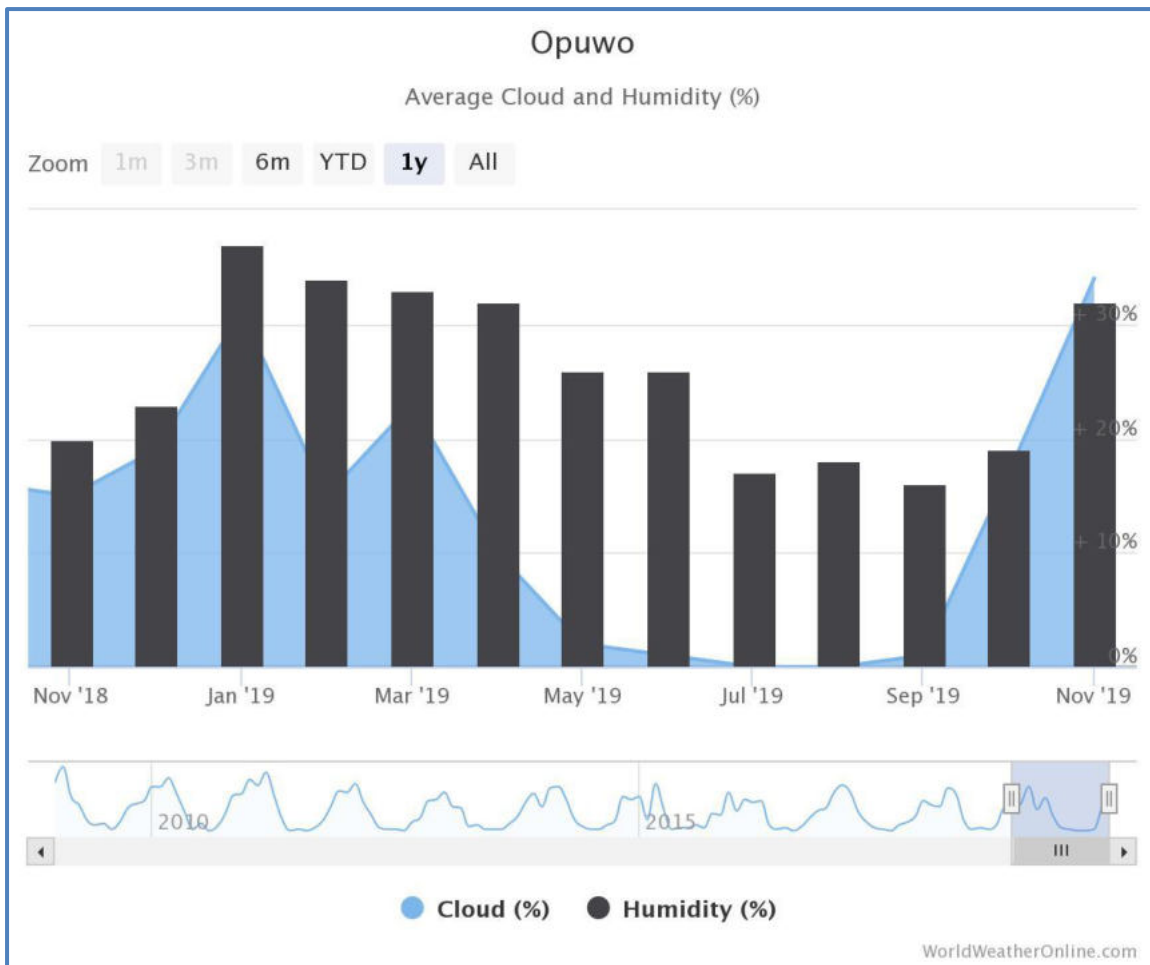
4.2.3 Wind

Predominantly easterly. Southerly, westerly, and northerly airflow are common. The Opuwo area is subject to erratic winds and considerable discrepancies despite short distances, due to the hilly terrain. The graph below depicts the wind patterns in the area. The highest wind speeds are attained in December as shown by the graph below.



4.2.4 Humidity

The relative humidity during the least humid months of the year, i.e., August and September, is around 16 % and the most humid month is January with 40% humidity. Namibia has a low humidity in general, and the lack of moisture in the air has a major impact on its climate by reducing cloud cover and rain and increases the rate of evaporation.



4.3 Air Quality

Activities around the exploration licence area mainly consist of tourism and small-scale livestock farming. Besides other exploration activities, there are no other industries or operating mines in the area or mines in the area. Probable sources of air pollution in the area are emissions and dust from vehicles travelling on gravel roads, dust generated by cattle grazing and wind erosion from the exposed areas.

PM₁₀ describes all particulate matter in the atmosphere with a diameter equal to or less than 10 µm and are generally emitted from motor vehicles (diesel engines) and burning of wood. PM_{2.5} describes all particulate matter in the atmosphere with a diameter equal to or less than 2.5 µm and are mostly related to combustion. NO₂ and nitric oxide (NO) are formed simultaneously in combustion processes and other high temperature operations such as blast furnaces. Sources of SO₂ include fossil fuel combustion from industry and power plants. SO₂ is emitted when coal or other biomass fuels are burnt for energy.

Data from accuweather.com shows that the air quality in the Opuwo area is generally excellent with an air quality index of 14 AQI. The ground-level ozone (O₃) is about 14 µg/m³ which is excellent. The fine particle matter levels (PM_{2.5}) are about 9 µg/m³. The particle matter (PM₁₀) is about 9 µg/m³. The nitrogen dioxide (NO₂), carbon monoxide (CO), and sulphur dioxide (SO₂) levels in the area are recorded to be 1 µg/m³.

4.4 Geology

The Kaoko Belt consists of four structural zones. From east to west they are the Eastern Kaoko Zone (EKZ), the Central Kaoko Zone (CKZ), the Western Kaoko Zone (WKZ) and the Southern Kaoko Zone (SKZ).

The Eastern Kaoko Zone is bounded on the west by the Sesfontein Thrust and on the east by a major anticlinal ridge which marks the end of the Kaoko Belt and the beginning of the Northern Platform characterized by gently folded Otavi Group carbonates and overlying Mulden Group pelites. The Otavi Group is comprised of the Tsumeb, Abenab and Ombombo Subgroups. The Eastern Kaoko Zone comprises predominantly Nosib and Otavi Group metasediments and minor metamorphic basement rocks which are progressively less deformed as the platform margin in the east is approached. The Mulden Group, a pelitic molasse, overlies the Otavi Group carbonates and outcrops in the southwestern part of the Eastern Kaoko Zone. Lower greenschist metamorphic grade characterizes Damara age rocks of the EKZ (Miller, 2008).

The Central Kaoko Zone is bounded on the east by the Sesfontein Thrust, on the west by the Purros Lineament, and is characterized by large, eastward verging folds of early-Proterozoic metamorphic basement and Damaran metasediments. Both the Central and Western Kaoko Zones are characterized by deep basin and slope facies overlying an Archean to Mesoproterozoic basement mosaic that experienced intense deformation at greenschist to upper-amphibolite metamorphic grade (Miller, 2008).

The two groups most important to mineralization on the property are the Nosib Group and the overlying Ombombo Group. The Damara Supergroup commences with the Nosib Group, a package of (meta-) sandstones, conglomerates and siltstones that has

been informally subdivided into lowermost conglomeratesandstone, middle siltstone-dominant, and uppermost sandstone-conglomerate sequences. The total thickness ranges to more than 1,000 metres. The Nosib Group comprises a series of prominent exposures of feldspathic quartzite to arkose, conglomerate, and shale, commonly expressed as elongate to rounded hills with a strong potassium (“K”) channel radiometric signature. The Nosib Group unconformably overlies the basement to the north and south and is commonly preserved as open synclines or monoclines (Miller, 1992).

In general, the Ombombo Subgroup of the EKZ consists of interbedded clastic and carbonate rocks, with (probably regional) variations in clastic grain size. It is comprised of a lower ‘Omivero’ shale and mixed, fine clastic unit overlain by a carbonate-dominated ‘Upper and Lower Omao’ succession. A siltstone within the Lower Omao that is often carbonaceous and pyritic and may host copper mineralization was designated the Horseshoe Member by TCN and has been renamed the Okohongo Horizon by INV Metals. These four units of the Ombombo Subgroup are part of the informal stratigraphy that emerged from TCN geological mapping programs. The lower units of the Ombombo appear to be semi-conformable with the underlying Nosib in the central EKZ and show a similar asymmetry, possibly thinning towards the northeast. The Omivero shale is restricted in outcrop to the Epunguwe and Okohongo areas and locally to the flanks of adjacent Nosib anticlines to the south. However, this lower part of the stratigraphy, including the Okohongo Horizon, is recessively weathered, and frequently covered by scree-alluvium (or calcrete) and thus may have a wider occurrence than mapped (Miller, 2008).

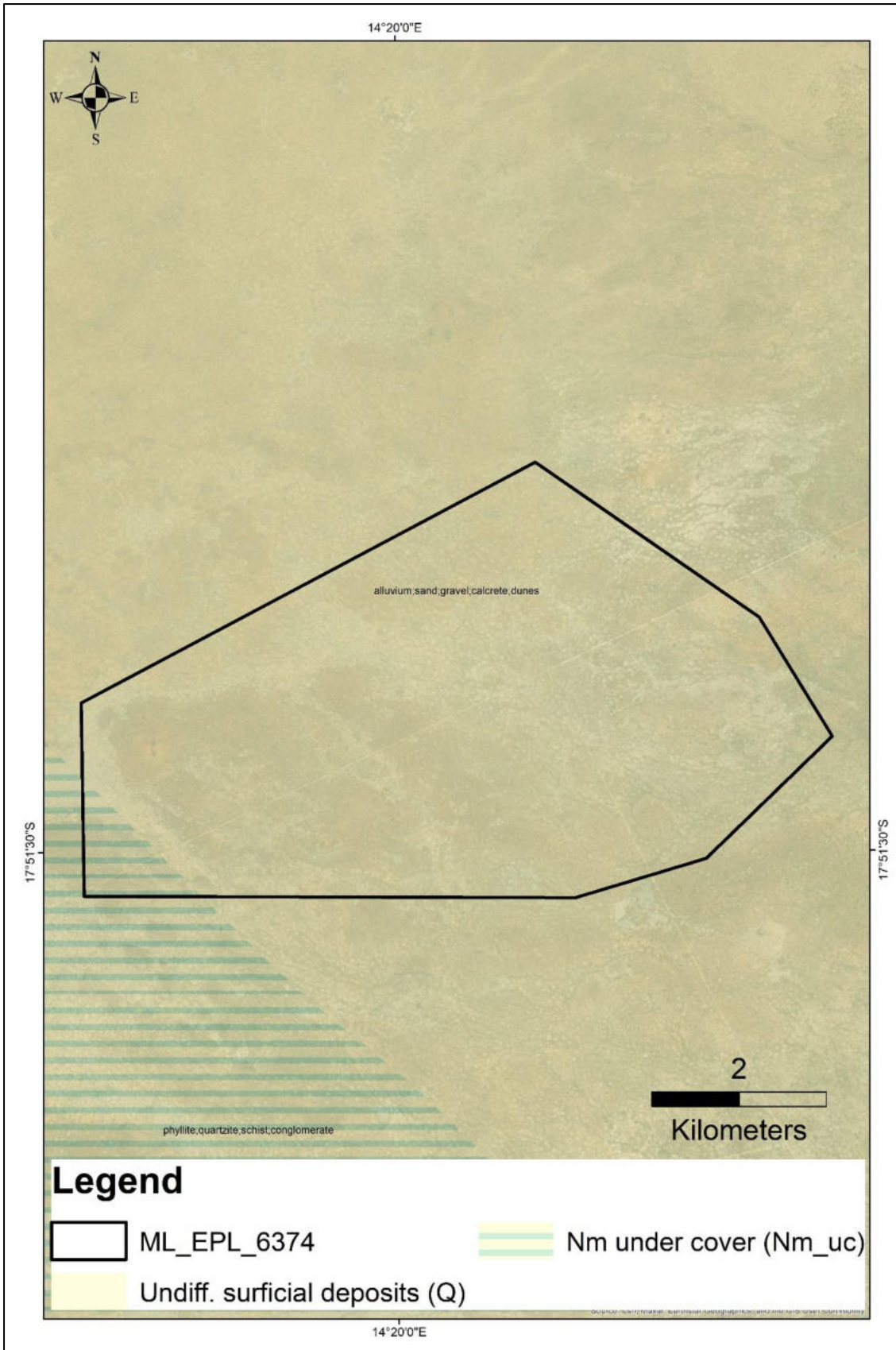


Figure 7 A geological map of the area

4.5 Hydrogeology and Water Resources

There are no major rivers that run through the licence area. There is a groundwater flow pattern observed in the southern part of the licence. The project area is underlain by a fractured aquifer with moderate groundwater potential.

4.6 Flora

Rainfall in the Kunene Region is usually both low and extremely variable which means that years of abundant rain often followed by extreme dry conditions (Mendelsohn, et al., 2002). In form, vegetation is generally sparse, with few trees and a thin variety of grass. Plant cover varies in relation to rainfall and so the eastern parts of Kunene have more grass and trees than the Western, coastal areas (Christian, 2005). The surrounding area is characterised by high botanical diversity. Based on the literature review, all the vegetation that are found within the vicinity of the area are of “medium” to “high” sensitivity against external conditions. The growing season is very short due to the semi-arid climate.

Grass is dependable on rainfall, which in-turn causes livestock and other animals to suffer during periods of minimal rainfall (Burke, 2003). The mineral exploration area, which is semi-arid, contains diverse vegetation species which include a number of species endemic to Namibia. Table 1 below lists the different plant species which are most likely to occur within the project area.

Table 1 A table showing plant species which are likely to occur in the area

SCIENTIFIC NAME	COMMON NAME	STATUS IN NAMIBIA
<i>Acacia erioloba</i>	Camel thorn	Protected
<i>Acacia mellifera</i>	Black thorn	Secure
<i>Acacia reficiens</i>	False umbrella thorn	Secure
<i>Acacia haematoxylon</i>	Grey camel thorn	Protected
<i>Acacia erubescens</i>	Blue thorn	Secure
<i>Acacia karroo</i>	Sweet thorn	Secure
<i>Acacia tortolis</i>	Umbrella thorn	Secure
<i>Acacia hereroensis</i>	False hook-thorn	Secure
<i>Commiphora tenuipetiolata</i>	White-stem corkwood	Secure
<i>Aloe littoralis</i>		Protected
<i>Ozoroa crassinervia</i>	Namibian resin tree	Near endemic, protected
<i>Boscia albitrunca</i>	Shepherd's tree	Protected

<i>Albizia anthelmintica</i>	Worm-bark false-thorn	Protected
<i>Ziziphus mucronata</i>	Buffalo-thorn	Protected
<i>Catophractes alexandri</i>	Trumpet thorn	Secure
<i>Combretum apiculatum</i>	Red bush willow	Secure
<i>Commiphora dinteri</i>		Endemic
<i>Commiphora glandulosa</i>	Tall common corkwood	Secure
<i>Commiphora glaucescens</i>	Blue-leaved corkwood	Nearendemic
<i>Croton gratissimus</i>	Lavender fever-berry	Secure
<i>Cyphostemma bainesii</i>		Endemic, protected
<i>Dichrostachys cinerea</i>	Sickle bush	Secure
<i>Diospyros lycioides</i>	Blue bush	Secure
<i>Dombeya rotundifolia</i>	Common wild pear	Endemic
<i>Ehretia alba</i>		Secure
<i>Elephantorrhiza suffruticosa</i>		Secure
<i>Euclea pseudebenus</i>	Ebony tree	Protected
<i>Euclea undulata</i>	Common guarri	Secure
<i>Euphorbia guerichiana</i>	Western woody milk bush	Secure
<i>Euphorbia virosa</i>		Secure
<i>Ficus cordata</i>	Namaqua fig	Protected
<i>Ficus ilicina</i>	Laurel fig	Secure
<i>Ficus sycomorus</i>	Common cluster fig	Protected
<i>Grewia bicolor</i>	White raisin	Secure
<i>Grewia flava</i>	Velvet raisin	Secure
<i>Grewia flavescens</i>	Sand paper raisin	Secure
<i>Gymnosporia senegalensis</i>	Red spike-thorn	Secure
<i>Ipomoea adenioides</i>		Secure
<i>Lycium bosciifolium</i>		Secure
<i>Lycium cinereum</i>		Secure
<i>Lycium eenii</i>		Secure
<i>Lycium hirsutum</i>		Secure
<i>Lycium villosum</i>		Secure
<i>Maerua juncea</i>		Secure
<i>Maerua schinzii</i>	Ringwood tree	Protected
<i>Manuleopsis dinteri</i>		Endemic
<i>Melianthus comosus</i>		Secure
<i>Obetia carruthersiana</i>		Near endemic
<i>Pechuel-Loeschea leubnitziae</i>		Secure
<i>Sterculia africana</i>	African star-chestnut	Protected
<i>Tarchonanthus camphoratus</i>		Secure
<i>Tetragonia schenckii</i>		Secure
<i>Vernonia cinerascens</i>		Secure
<i>Searsia (Rhus) ciliata</i>		Secure
<i>Searsia (Rhus) lancea</i>	Karree	Protected
<i>Searsia (Rhus) marlothii</i>		Secure

The density of vegetation in the vicinity of the mineral exploration site is sparse. Every effort will be made to protect the existing trees and shrubs, as these are very important to the ambience and visual appeal of the mineral exploration site. A vegetation expert will be consulted throughout the lifecycle of the mineral exploration program. The protected plant species in the project area are shown in the table below.

Table 2 Table of plant species which are protected under the Forestry Act and likely to occur in the area.

SCIENTIFIC NAME	COMMON NAME
<i>Acacia erioloba</i>	Camel thorn
<i>Acacia haematoxylon</i>	Grey camel thorn
<i>Albizia anthelmintica</i>	Worm-bark false-thorn
<i>Boscia albitrunca</i>	Shepherd's tree
<i>Euclea pseudebenus</i>	Ebony tree
<i>Ficus cordata</i>	Namaqua fig
<i>Ficus sycomorus</i>	Common cluster fig
<i>Maerua schinzii</i>	Ringwood tree
<i>Ozoroa crassinervia</i>	Namibian resin tree
<i>Searsia (Rhus lancea)</i>	Karree
<i>Sterculia Africana</i>	African star-chestnut

4.7 Fauna

4.7.1 Introduction

The information is based on a detailed literature review and a site visit which was carried out. The purpose of the Fauna literature review is to identify all potential amphibians, reptiles, and mammals expected on the project area and the surrounding farms in the vicinity of the mineral exploration area. The proposed mineral exploration area supports numerous faunal species but there are no species that are exclusive to the study area.

Larger types of animals such as zebras, giraffes, and lions are rare in this area. There are no species which are exclusively endemic to the exploration area. Based on literature review, development of a mineral exploration project in the area will not have a negative impact on any of the species in the project area.

4.7.2 Amphibians

Based on the literature review, there are generally 14 types of amphibian species that occur in project area. Nine of these amphibian species occur abundantly, two occur rarely and six of them occur uncommonly. Griffin (1998) highlighted that amphibian species are declining throughout the world due to various factors such as climate change and habitat destruction. There are approximately 4000 species of amphibians worldwide of which over 200 species are present in Southern Africa and 57 in Namibia (Griffin, 1998). However, this low figure may be due to the lack of detailed studies carried out on amphibians. The table below shows the different amphibian species that are likely to occur within the study area.

Table 3 A list of amphibian species which may occur in the project area

SCIENTIFIC NAME	COMMON NAME	STATUS	OCCURRENCE	REFERENCE
PLATANNAS				
<i>Xenopus laevis</i>	COMMON PLATANNA	SECURE	ABUNDANTLY	(Daudin, 1802)
TOADS				
<i>Breviceps adspersus</i>	BUSHVELD RAIN FROG	SECURE	ABUNDANTLY	Peters, 1882
<i>Bufo dombensis</i>	DOMBE DWARF TOAD	ENDEMIC & INADEQUETLY KNOWN	ABUNDANTLY	Bocage, 1895
<i>Bufo poweri</i>	MOTTLED TOAD	SECURE	ABUNDANTLY	Hewitt, 1935
FOSSORIAL FROGS				
<i>Phrynomantis affinis</i>	SPOTTED RUBBER FROG	AMBIGUOUS (RARE?)	RARELY	(Boulenger, 1901)
<i>Phrynomantis bifasciatus</i>	BANDED RUBBER FROG	SECURE	ABUNDANTLY	(Smith, 1848)
SAND FROGS, BULLFROGS, RIDGED FROGS, CACOS, PUDDLE FROGS etc.				
<i>Cacosternum boettgeri</i>	COMMON CACO	SECURE	ABUNDANTLY	(Boulenger, 1882)
<i>Hildebrandtia ornata</i>	ORNATE FROG	SECURE	UNCOMMONLY	(Peters, 1878)
<i>Phrynobatrachus mababiensis</i>	MABABE PUDDLE FROG	SECURE	UNCOMMONLY	FitzSimons, 1932

<i>Phrynobatrachus natalensis</i>	SNORING PUDDLE FROG	SECURE	UNCOMMONLY	(A. Smith, 1849)
<i>Pyxicephalus adspersus</i>	GIANT BULLFROG	SECURE	ABUNDANTLY	Tschudi, 1838
<i>Tomopterna krugerensis</i>	KNOCKING SAND FROG	SECURE	RARELY	Passmore et al, 1975
<i>Tomopterna tandyi</i>	TANDY'S SAND FROG-	SECURE	ABUNDANTLY	Channing et al, 1996
TREE FROGS, REED FROGS & KASSINAS				
<i>Kassina senegalensis</i>	BUBBLING KASSINA	SECURE	ABUNDANTLY	(Dumèril et al, 1841)

4.7.3 Mammals

Based on the literature review, there are generally about 68 species of mammals expected to occur within the immediate area. There are generally 25 species which rarely occur, 2 species that occur seasonally, 4 that occur occasionally, and 33 that occur abundantly within the project area. Considering the relative size of the mineral exploration area, the mammal fauna will not be affected by the mineral exploration activities of the proponent. Namibia is seemingly well endowed with mammal diversity with around 250 species known to be present within the country (Griffin, 1998). There are currently 14 mammal species which are considered to be endemic to Namibia, including 11 species of rodents and small carnivores which are not well known. Griffin (1998), points out that most of these endemic mammals are associated with the Namib and Escarpment with 60% of these appearing to be rock-dwelling species. The author, Griffin (1998) further highlights that the endemic mammal fauna is best characterized by the endemic rodent family *Petromuridae* (Dassie rat) and the rodent genera *Gerbillurus* and *Petromyscus*. The table below shows the mammal species which are likely to occur within the study area. A full list, of mammal species that are likely to occur within the area, is in the appendix section at the end.

Table 4 Mammal species which are likely to occur within the project area.

SCIENTIFIC NAME	COMMON NAME
<i>Acinonyx jubatus</i>	Cheetah
<i>Antidorcas marsupialis</i>	Springbok
<i>Atelerix frontalis angolae</i>	Southern African Hedgehog
<i>Canis mesomelas</i>	Black-backed Jackal
<i>Caracal caracal</i>	Caracal
<i>Crocuta crocuta</i>	Spotted Hyena
<i>Cynictis penicillata</i>	Yellow Mongoose

<i>Equus zebra hartmannae</i>	Hartmann's Mountain Zebra
<i>Felis nigripes</i>	Black-footed Cat
<i>Felis silvestris/lybica</i>	African Wild Cat
<i>Galerella sanguinea</i>	Slender Mongoose
<i>Genetta genetta</i>	Small Spotted Genet
<i>Ictonyx striatus</i>	Striped Polecat
<i>Lepus capensis</i>	Cape Hare Secure
<i>Lepus saxatilis</i>	Scrub Hare
<i>Manis temminckii</i>	Ground Pangolin
<i>Mellivora capensis</i>	Honey Badger/Ratel
<i>Oreotragus oreotragus</i>	Klipspringer
<i>Oryx gazella</i>	Gemsbok
<i>Otocyon megalotis</i>	Bat-eared Fox
<i>Panthera pardus</i>	Leopard
<i>Parahyaena (Hyaena) brunnea</i>	Brown Hyena
<i>Phacochoerus africanus</i>	Common Warthog
<i>Proteles cristatus</i>	Aardwolf
<i>Raphicerus campestris</i>	Steenbok
<i>Suricata suricatta marjoriae</i>	Suricate
<i>Sylvicapra grimmia</i>	Common Duiker
<i>Tragelaphus strepsiceros</i>	Greater Kudu
<i>Vulpes chama</i>	Cape Fox

4.7.4 Reptiles

The literature review showed that there are approximately 60 reptile species that are expected to occur in the site area. According to the Namibia Conservation Ordinance of 1975, there are four reptile species protected, namely:

Table 5 Protected reptile species in the project area

SCIENTIFIC NAME	COMMON NAME	STATUS
<i>Psammobates Oculiferus</i>	Kalahari Tent Tortoise	Protected
<i>Python Natalis</i>	Southern African Python	Protected
<i>Geochelone Pardalis</i>	Leopard Tortoise	Protected
<i>Varanus Albigularis</i>	Veld Leguaan	Protected

Griffin (1998) highlighted the presence of 261 species of reptiles which are present in Namibia. These reptiles make up 30% of the reptile species found on the continent. 55 species of Namibian Lizards are classified as endemic (Griffin, 1998). The author, Griffin (1998), describes that more than 60% of the reptiles found in Namibia are protected by the conservation Ordinance. Although mineral exploration activities do affect reptile habitat, the project will not have any significant impact on the reptile species within the proposed mineral exploration area. Namibia, with 129 species of

lizards, has one of the continent's richest lizard Fauna. The table in the appendix shows the reptile species which are likely to occur within the vicinity of the mineral exploration area.

4.8 Avifauna (Birds)

Simmons et al (2003) points that although Namibia's Avifauna is comparatively sparse compared to the high rainfall equatorial areas elsewhere in Africa, approximately 658 species have already been recorded with a diverse unique group of arid endemics. There are approximately 650 species of birds that have been recorded in Namibia, although the country's avifauna is comparatively sparse compared to the high rainfall equatorial areas in Africa (Brown & Lawson, 1989). Brown et al (1989) mentions that 14 species of birds are endemic or near endemic to Namibia with the majority of Namibian endemics occurring in the Savannah of which ten species occur in a north-south belt of dry Savannah in Central Namibia. Simmons (2003) recorded 63 species of birds within the vicinity of the project area. 650 bird species are recorded in Namibia, of which 160 species are present in area, especially after good rains fall (Christian, 2005). These birds consist of raptors, chats, larks and karoid species. Christian (2005) recorded the presence of the following bird species in the vicinity of the area, which include:

Table 6 Bird species which are likely to occur within the site area.

SCIENTIFIC NAME	COMMON NAME
Agapornis roseicollis	Rosy-faced Lovebird
Eupodotis rueppellii	Rüppell's Korhaan
Lanioturdus torquatus	White-tailed Shrike
Parus carpi	Carp's Tit
Phoeniculus damarensis	Violet Wood-Hoopoe
Poicephalus rueppellii	Rüppell's Parrot
Pternistis hartlaubi	Hartlaub's Spurfowl
Tockus damarensis	Damara Hornbil
Tockus monteiri	Monteiro's Hornbill

A full list of bird species within the area is shown in the appendix.

4.9 Archaeology and Heritage Sites

A separate heritage study is annexed to this report.

4.10 Socio-Economic Environment

4.10.1 Demographics of Opuwo

Opuwo is the capital of the Kunene Region in north-western Namibia. The town is situated about 720 km north-northwest from the capital Windhoek and has a population of 7,500. Opuwo is situated at the intersection of the C41 and C43. There is a small airfield in town, Opuwo Airport. Putuavanga Senior Secondary School in town is among the best government schools in Kunene Region. There is also the Opuwo Primary School with 39 teachers and 1,200 learners.

There are the following organizations and offices in the town: Opuwo Police Station, Opuwo District Hospital, Ministry of Home Affairs (Department of Civic Affairs / Regional Civic Registration Office / Kunene Region) and Opuwo Department of Works. Opuwo suffers from a lack of economic development and employment opportunities, which leads to frustration and outward migration among many of the town's youth.

The economy of the region is mainly based on tourism and is slowly becoming more diversified due to expansion in the service station industry. The largest industry in the region is the tourism industry, followed by the farming and retail industry. The third biggest income generating activity of the Kunene Region is tourism.

4.10.2 Social Economic Impact

Although people (including communal farmers) and animals might be negatively affected by dust and noise, the explorer will ensure that these aspects are properly mitigated. With the potential employment of 20 people, this means that 20 families will benefit from the project during the exploration phase. The project has great potential to improve livelihoods and contribute to sustainable development within the surrounding community. Community meetings will be held from time to time by the proponent wherever possible, with the purpose of effectively communicating with the local community and to avoid any unexpected social impacts.

5. Assessment of Impacts

The purpose of this assessments of impacts section is to identify and consider the most pertinent environmental impacts and to provide possible mitigation measures that are expected from the mining activities on the proposed mining sites. Two different phases are associated with the proposed development. Two different phases are associated with the proposed development. Firstly, the construction phase, and secondly the operational phase is being covered by this assessment. Should the mining activities cease in the future, an EIA will need to be conducted to deal with the associated changes to environment. Mitigation measures for the identified impacts are also provided in this Section.

The following assessment methodology was used to examine each impact identified:

Table 7 Assessment methodology used to examine the impacts identified

Evaluation Criteria	Symbol	Significance of Rating
Nature of impact:	P or N	Effect the proposed activity would have on the affected environment which is positive (P) or negative (N)
Extent of impact:	O	On-Site (the site and it's immediate surrounds)
	L	Local (Mining Area)
	R	Regional (Kunene Region)
	N	National (Namibia)
	I	International
Duration of impact:	SD	Short Duration (0 to 5 years)
	MD	Medium Duration (5 to 15 years)
	LD	Long Duration (lifetime of the development)
Intensity of impact:	L	Low intensity where the natural, cultural and social functions and processes are not affected.
	M	Medium intensity where the affected environment is altered but natural, cultural and social functions and processes can continue.
	H	High intensity where the affected environment is altered to the extent that natural, cultural and social functions and processes will temporarily or permanently cease.
Probability of impact:	LP	Low probability is when the possibility of the impact occurring is low.
	P	Probable is when there is a distinct possibility that it will occur.
	HP	Highly probable is when the impact is most likely to occur.
	D	Definite where the impact will occur.

Significance of Impact: Further subdivided into impacts with mitigation (MM) measures and impacts with no mitigation measures (NMM).	L	Low Significance is when natural, cultural, social and economic functions and processes are not affected. If the impacts are adverse, mitigation is either easily achieved or little will be required, or both. If impacts are beneficial, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming
	M	Medium Significance is when the affected environment is altered but natural, cultural, social and economic functions and processes can continue. An impact exists but is not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of beneficial impacts, other means of achieving this benefit are about equal in time, cost and effort.
	H	High Significance is when the affected environment is altered to the extent that natural, cultural, social and economic functions and processes will temporarily or permanently cease. If impacts are adverse, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time consuming or a combination of these. In the case of beneficial impacts, the impact is of a Substantial order within the bounds of impacts that could occur.

5.1. Overall socio-economic benefits and issues

5.1.1. Socio-economic benefits

With the potential employment of 120 people, this means that 120 families will benefit from the project during the construction phase. The project has great potential to improve livelihoods and contribute to sustainable development within the surrounding community. Community meetings will be held from time to time by the proponent wherever possible, with the purpose of effectively communicating with the local community and to avoid any unexpected social impacts.

5.1.1.1. Potential Direct Benefits

Direct capital investment: The mining project will require a significant capital investment of at least N\$ 600,000. This will be used for purchasing plant and machinery required for the project.

Stimulation of skills transfer: Due to the nature of mining operations, the proponent will implement ad-hoc training programme for some of its staff members. Training programmes will be well structured and staff members will permanently benefit from these training programmes.

Job creation: With the potential employment of 120 people, this means that 120 families will benefit from the project during the on-going phase. The project has a great potential to improve livelihoods and contribute to sustainable development within the surrounding community.

5.1.1.2. Potential Indirect Benefits

- The data generated from the mining activities will be made available to the Ministry of Mines and Energy for future research purposes.
- General enhancement of the health conditions and quality of life for a few people in the surrounding settlements.
- Of significance is the prospect of diversification of the surrounding economy, which is presently mainly focussed on farming, tourism and small-scale mining of semi-precious stones.

5.1.1.3. General socio-economic concerns

Notwithstanding the above benefits there are a few concerns that could reduce or counteract the above benefits related to the project, as follows:

- As the movement of staff and contractors to and from the area increases, the risk of spread of HIV/AIDS increases.
- Increased influx of people to the area as people come in search of job opportunities during the construction and operational phase of the mining project; and
- Increased informal settlement and associated problems.

Table 8 Impact evaluation for socio-economy

Identified Impact	Significance		Duration	Extent	Intensity	Probability
	NMM	MM				
Increased spread of HIV/AIDS	M	L	LD	N	M	LP
Increased influx of people to the area	L	L	SD	L	L	P
Increased informal settlement in the area	M	L	MD	L	L	LP

5.2. Mining phases and associated issues

5.2.1. Construction Phase of the Project

The following potential effects on the environment during the construction phase of the mining project have been identified:

5.2.1.1. Dust

Dust may be generated during this phase and might be aggravated during the winter months when strong winds occur. Dust will be generated by the vehicles moving in the area. Fall out dust settling on vegetation is likely to cause local disruptions in herbivorous and predatory complexes and should be minimised as far as possible.

5.2.1.2. Noise

Noise will most likely be generated by vehicles during the construction phase. It is recommended that vehicle movement be limited to normal daytime hours to allow nocturnal animals to roam freely at night.

5.2.1.3. Safety and Security

During construction, small tools and equipment will be used on site. This increases the possibility of injuries and the responsible manager must ensure that all staff members are briefed about the potential risks of injuries on site. The manager is further advised to ensure that adequate emergency facilities, including first aid kits, are available on site. All Health and Safety standards specified in the Labour Act should be complied with.

Should a camp be necessary at a later stage, it should be located in such a way that it does not pose a risk to the community members and wildlife that roam the area.

5.2.1.4. Visual

The proposed mining area is situated more than 1 km from any main road. As such, any visual impact that might be caused by the team are minimal. In some parts of the area, the topography of the mining site is slightly elevated.

Table 9 Impact evaluation for the construction phase of the project

Identified	Significance	Duration	Extent	Intensity	Probability

Impact	NMM	MM				
Dust	L	L	SD	L	L	P
Noise	M	L	SD	L	M	D
Safety & Security	L	L	SD	O	L	P
Visual	L	L	MD	O	L	LP

5.2.2. Operational phase of the Project

During the operation phase of the project, rock units will be cut by using a wire saw and sand will be excavated. For the purpose of conveniently refuelling company vehicles without driving long distances, a small fuel storage tank will be kept on site.

5.2.2.1. Air Quality

In terms of air quality, emissions will be given off by 4x4 vehicles, excavators, front end loaders and the drill rig but not to an extent that warrants concern. Dust will also be produced by the drill rig and the movement of vehicles in the area.

5.2.2.2. Fire and Explosion Hazard

Hydrocarbons are volatile under certain conditions and their vapours in specific concentrations are flammable. If precautions are not taken to prevent their ignition, fire and subsequent safety risks may arise.

All fuel storage and handling facilities in Namibia must however comply with strict safety distances as prescribed by SANS 10089. SANS 10089 is adopted by the Ministry of Mines and Energy as the national standard.

It must further be assured that sufficient water is available for firefighting purposes. In addition to this, all personnel must be sensitised about responsible fire protection measures and good housekeeping such as the removal of flammable materials including rubbish, dry vegetation, and hydrocarbon-soaked soil from the vicinity of the mining area. Regular inspections should be carried out to inspect and test firefighting equipment and pollution control materials at the drilling site.

All fire precautions and fire control at the site must be in accordance with SANS 10089-1:1999, or better. A holistic fire protection and prevention plan is needed.

Experience has shown that the best chance to rapidly put out a major fire, is in the first 5 minutes. It is important to recognise that a responsive fire prevention plan does not solely include the availability of firefighting equipment, but more importantly, it involves premeditated measures and activities to timeously prevent, curb and avoid conditions that may result in fires. An integrated fire prevention plan should be drafted before drilling.

5.2.2.3. Generation of Waste

Solid waste be generated from contractors, staff members and other visitors to the area. Care should be taken when handling waste material.

The types of waste that could be generated during operation include hazardous industrial waste (e.g. lubricants), general industrial waste (e.g. scrap material), and domestic waste (e.g. packaging). The waste will be temporarily handled and stored on site before being removed for final disposal at permitted waste disposal facilities. A registered Waste Management Company would be contracted to remove all hazardous waste from the site. Ablution facilities will use chemical toilets and/or sealed septic tanks and the sewerage taken to the Windhoek periodically. No waste will be discharged on site.

5.2.2.4. Health and Safety

The drilling programme operations can cause serious health and safety risks to workers on site. Occupational exposures are normally related to the dermal contact with fuels and inhalation of fuel vapours during handling of such products. For this reason, adequate measures must be brought in place to ensure safety of staff on site, and includes:

- Proper training of operators;
- First aid treatment;
- Medical assistance;
- Emergency treatment;
- Prevention of inhalation of fumes;
- Protective clothing, footwear, gloves and belts; safety goggles and shields;

-
- Manuals and training regarding the correct handling of materials and packages should be in place and updated as new or updated material safety data sheets becomes available;
 - And Monitoring should be carried out on a regular basis, including accident reports.

5.2.2.5. Fauna

Mining activities may have minor disturbances on the habitat of a few species but no significant impacts on the animals are expected. The proponent shall ensure that no animal shall be captured, killed or harmed by any of the employees in any way. Wildlife poaching will strongly be avoided as this is an offence and anyone caught infringing in this regard will face suspension from the project and will be liable for prosecution.

5.2.2.6. Vegetation

The natural vegetation is seemingly undisturbed in the project area except for grasses, which have been grazed by livestock and wild animals. Some vegetation species in the area may be adversely impacted by the project. The type of vegetation that might be affected by the project are:

- Bushes
- Ephemeral grasses
- Small trees

Some of the sensitive vegetation types in the area include:

- Shallow drainage line vegetation
- Scrublands surrounding the mining area

Certain species regarded as particularly important for conservation may yet be identified and made known via an Addendum to this report. If particularly important species are found, they will be located by GPS and their locations communicated to the Ministry of Environment and Tourism. Such locations will then be demarcated and completely avoided.

5.2.2.7. Avifauna

Birds or Nest sites will not be disturbed by any employee, tourist or contractor. Should the employees observe any bird nesting sites for vultures, they will be reported to the Ministry of Environment and Tourism and the site will be avoided.

5.2.2.8. Alien Invasive Plants

Disturbance to the natural environment often encourages the establishment of alien invasive weed species. Some of the plant species that could become invasive in the area are listed below:

- *Prosopis glandulosa*
- *Lantana camara*
- *Cyperus esculentus*
- *Opuntia imbricate*
- *Cereus jamacara*
- *Melia azedarach*
- *Harissia martini*

There are numerous ways in which invasive species can be introduced deliberately or unintentionally.

5.2.2.9 Heritage Impacts

Although no archaeological sites have been identified yet in the project area, appropriate measures will be undertaken upon discovering any new archaeological sites. All archaeological remains are protected under the National Heritage Act (2004) and will not be destroyed, disturbed or removed. The Act also requires that any archaeological finds be reported to the Heritage Council Windhoek.

Table 10 Impact evaluation for the operational phase of the project

Identified Impact	Significance		Duration	Extent	Intensity	Probability
	NMM	MM				
Air Quality	M	L	LD	L	M	HP
Fire & Explosion Hazard	H	M	SD	O	M	LP
Generation of waste	M	L	LD	O	L	D
Health and Safety	H	M	MD	N	L	P
Fauna	M	L	MD	L	M	D

Vegetation	M	L	MD	L	M	D
Avifauna	M	L	MD	L	M	LP
Alien Invasive Plants	M	L	MD	L	M	P
Heritage	M	L	LD	O	H	LP

5.2.2.10 Groundwater Impacts

Mining activities may affect the availability of water and the quality thereof. Surface water for animals may be affected by mining activities. In rare instances, the quality of the groundwater for water consumption may be compromised by mining activities.

6. Environmental Management Plan

6.1 Overview

This Environmental Management Plan is intended to give effect to the recommendations of the Environmental Impact Assessment. To achieve this goal, it is essential that all personnel involved on the mining are fully aware of the environmental issues and the means to avoid or minimize the potential impacts of activities on site. The proposed mining activities are summarized in Section 3 of the scoping report above. 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. A general description of the environment is contained in Section 4, and more site-specific information on particularly sensitive areas is contained in Section 4 as well. Issues and concerns identified in the EIA will form a set of environmental specifications that will be implemented on site. It is the intention that these environmental specifications should form the basis for an agreement between the proponent and the Ministry of Environment and Tourism. By virtue of that agreement, these specifications will become binding on the proponent.

Environmental management requires a joint effort on the part of all parties involved. The proponent has assigned certain roles to ensure that all players fulfil their responsibilities in this regard.

6.2 Environmental Management Principles

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

1. 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 mining areas in connection with the mining project.
2. Health, Safety and Social Well Being

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- 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.

3. Biophysical Environment

- Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
- Prevent or minimise 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.

A. Commitment and Accountability:

The proponent's 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 mining activities or by personnel engaged in the mining activities, including any recreational activities carried out by personnel in the area

B. Competence

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

C. Risk Assessment, Prevention and Control

Identify, assess and prioritise 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.

D. 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.

E. 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.

F. 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 mining project.

G. Financial Provisions for Mining

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

6.3 Impacts on the Bio-physical Environment

6.3.1 Impacts on Archaeological Sites

The **nature of impact** is outlined below:

- Potential damage to archaeological sites as a result of vehicle tracks, footprints and actions of contractors, employees and visitors of the mining site.
- As the mitigation measures below are fully enforced, any impact will be significantly reduced compared to with present situation.

Mitigation Measures to be enforced:

- Buffer zones will be created around the sites.
- Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mining activities.

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- All archaeological sites to be identified and protected before construction commences.
 - Notices/information boards will be placed on sites.
 - Training employees regarding the protection of these sites.

Methods for monitoring:

- An archaeologist will inspect any identified archaeological sites before commencing with the mining activities.

6.3.2 Impacts on Fauna

The **nature of impact** is outlined below:

- Movement of vehicles in and out of the site.
- Noise produced by moving earth-moving equipment.

Mitigation Measures to be enforced:

- Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible.
- A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise.
- No animals shall be killed, captured or harmed in any way.
- No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict.
- Care will be taken to ensure that no litter is lying around as these may end up being ingested by wild animals
- No animals shall be fed. This allows animals to lose their natural fear of humans, which may result in dangerous encounters.

Methods for monitoring:

- Regular monitoring of any unusual signs of animal habitat.

6.3.3 Impacts on Avifauna

Birds or Nest sites will not be disturbed by any employee, visitor or contractor.

6.3.4 Impact on Vegetation

The **nature of impact** is outlined below:

- Negative impacts on plants from trenching, compacting and removal of plants.
- Negative Impact from movement of vehicles and the movement of people around the site.
- Negative impacts from land-clearing and mining operations.

Mitigation Measures to be enforced:

- Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.
- Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible.
- The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided.
- The movement of vehicles will be restricted to certain tracks only.
- Areas with species of concern will be avoided.
- Ministry of Environment and Tourism will be informed of any protected species which will be transplanted in consultation with MET.

6.3.5 Impacts of Alien invasive Plants

The **nature of impact** is outlined below:

- Plant or seed material may adhere to car tyres or animals
- Seed or plant material may be imported to site in building materials if the source is contaminated.
- Seeds may blow from debris removed at sites.

Mitigation Measures to be enforced:

- The explorer will ensure that debris is properly disposed of.
- Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure.
- Eradicating alien plants by using an Area Management Plan

Methods for monitoring:

- Regular monitoring of any unusual signs of alien species.

6.3.6 Impacts on Socio-Economic

The **nature of impact** is outlined below:

- 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 mining.

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.
- 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:

- Public meetings will be held by the proponent whenever necessary.

6.3.7 Visual Impacts

The **nature of impact** is outlined below:

- Tracks and damaged vegetation caused by the mining vehicles.

Mitigation Measures to be enforced:

- Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.

Methods for monitoring:

- Employees will be trained on the importance of minimising visual impacts.

6.3.8 Use of Natural Resources

Water and electricity are very scarce in Namibia. During the mining, best international practices will be considered as a minimum standard for operation. The bulk of the power supply to the mining site will be sourced from the proponent's own generator. The proponent will maximise water recycling opportunities wherever possible.

6.3.9 Generation of Solid Waste

Correct management of solid waste will involve a commitment to the full waste life cycle by all the employees and contractors of the site. The Proponent's goal is to avoid the generation of solid waste in the first place and if not possible, to minimise the volumes generated by looking at technologies that promote longevity and recycling of products. Ideally, the proponent should transport solid waste to a registered site for disposal. However, it is not certain if such facilities are available in the area or if they have the capacity to handle large increases in volume. Appropriate on-site facilities will be designed to store large volumes of waste.

6.3.10 Noise

The **nature of impact** is outlined below:

- Movement of people, and vehicles.
- Noise may be generated from the drill rig and wire saw.

Mitigation Measures to be enforced:

- Disturbance to fauna that roam the area will be minimized by training the employees on ways to minimise noise.

6.3.11 Air Quality

The **nature of impact** is outlined below:

- Dust from movement of people, vehicles and earth-moving machinery. Emissions from vehicles and drill rigs as well.

Mitigation Measures to be enforced:

- All staff on should be equipped with dosimeters that measure exposure levels to radiation.
- All staff must be made aware of the health risk and obliged to wear dust masks.

6.4 Summary of Environmental Management Plan during construction, operation and decommissioning phases

Construction/Initial Phase			
Environmental Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Air pollution	<ul style="list-style-type: none"> • Control speed and operation of construction vehicles. • Prohibit idling of vehicles. • Maintenance of vehicles and equipment. • Sensitize field mining workers and contractors. • Workers should be provided with dust masks if working in sensitive areas. 	<ul style="list-style-type: none"> • Contractor • Site Manager 	<ul style="list-style-type: none"> • Amount of dust produced. • Level of Landscaping carried out.
Noise pollution	<ul style="list-style-type: none"> • Maintain equipment and vehicles. • Work should only be carried out only during daytime i.e. 08h00 to 17h00. • Workers should wear earmuffs if working in noisy section. • Management to ensure that noise is kept within reasonable levels. 	<ul style="list-style-type: none"> • Contractor • Management 	Amount of noise
Solid waste	<ul style="list-style-type: none"> • Any debris should be collected by a waste collection company • If trenches are dug, waste should be re-used or backfilled. • The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during mining. 	<ul style="list-style-type: none"> • Management 	Presence of well-Maintained receptacles and central collection point.
Oil leaks and spills	<ul style="list-style-type: none"> • Vehicles and equipment should be well maintained to prevent oil leaks. • Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. • All oil products should be handled carefully. 	<ul style="list-style-type: none"> • Contractor 	No oil spills and leaks on the site
First aid	<ul style="list-style-type: none"> • A well-stocked first aid kit shall be maintained by qualified personnel 	<ul style="list-style-type: none"> • Management 	Contents of the first aid kit.

Visual	<ul style="list-style-type: none"> Environmental considerations will always be adhered to before clearing roads, trenching and excavating. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Employees will be trained on the importance of minimising visual impacts.
Archaeological Sites	<ul style="list-style-type: none"> Buffer zones will be created around the sites. Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mining activities. All archaeological sites to be identified and protected before further mining commences. 	<ul style="list-style-type: none"> Management 	<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 Train workers on personal safety and how to handle equipment and machines. A well-stocked first aid kit shall be maintained by qualified personnel. Report any accidents / incidences and treat and Compensate affected workers. Provide sufficient and suitable sanitary conveniences which should be kept clean. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Workers using Protective Equipment. Presence of Well stocked First Aid Box. Clean sanitary facilities.
Fauna	<ul style="list-style-type: none"> Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. No animals shall be killed, captured or harmed in any way. No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	<ul style="list-style-type: none"> The explorer will ensure that debris is properly disposed of. Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure. Eradicating alien plants by using an Area Management Plan 	<ul style="list-style-type: none"> Management Contractor 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of alien species.
Loss of vegetation	<ul style="list-style-type: none"> Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. The movement of vehicles will be restricted to certain tracks only. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Warning signs on site restored vegetation
Operational Phase			
Environmental/Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Noise pollution	<ul style="list-style-type: none"> Maintain vehicles and drilling equipment. Mining should be carried out only during daytime. Workers to wear earmuffs if working in noisy section 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Amount of noise

	<ul style="list-style-type: none"> • Management to ensure that noise is kept within reasonable levels. 		
Visual	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Employees will be trained on the importance of minimising visual impacts.
Fauna	<ul style="list-style-type: none"> • Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. • A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. • No animals shall be killed, captured or harmed in any way. • No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	<ul style="list-style-type: none"> • The explorer will ensure that debris is properly disposed of. • Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure. • Eradicating alien plants by using an Area Management Plan 	<ul style="list-style-type: none"> • Management • Contractor 	<ul style="list-style-type: none"> • Regular monitoring of any unusual signs of alien species.
Loss of vegetation	<ul style="list-style-type: none"> • Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. • Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. • The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. • The movement of vehicles will be restricted to certain tracks only. 	<ul style="list-style-type: none"> • Contractor • Management 	<ul style="list-style-type: none"> • Warning signs on site • restored vegetation
Solid waste	<ul style="list-style-type: none"> • Minimize solid waste generated on site. • Recycle waste especially waste from trenching. • Debris should be collected by waste collection company. • Excavation waste should be re-used or backfilled. 	<ul style="list-style-type: none"> • Contractor • Management 	<ul style="list-style-type: none"> • Amount of waste on Site • Presence of well-Maintained receptacles and central collection point.
Oil leaks and spills	<ul style="list-style-type: none"> • Machinery should be well maintained to prevent oil leaks. • Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. • All oil products should be stored in a site store and handled carefully. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • No oil spills and leaks on the site.
Archaeological Sites	<ul style="list-style-type: none"> • Buffer zones will be created around the sites. • Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mining activities. • All archaeological sites to be identified and protected before further mining commences. 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Update Register of all archaeological sites identified.

First aid	<ul style="list-style-type: none"> • A well-stocked first aid kit shall be maintained by qualified personnel 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Contents of the first aid kit.
Fire preparedness	<ul style="list-style-type: none"> • Firefighting drills carried out regularly. • Firefighting emergency response plan. • Ensure all firefighting equipment are regularly maintained, serviced and inspected. • Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence. 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Number of fire drills carried. • Proof of inspection on firefighting equipment. • Fire Signs put up in strategic places. • Availability of firefighting equipment.
Environment Health and Safety	<ul style="list-style-type: none"> • Train workers on personal safety and disaster preparedness. • A well-stocked first aid kit shall be maintained by qualified personnel. • Report any accidents / incidences and treat and compensate affected workers. • Provide sufficient and suitable sanitary conveniences which should be kept clean. • Conduct Annual Health and Safety Audits. 	<ul style="list-style-type: none"> • Management 	<ul style="list-style-type: none"> • Provide sanitary facilities. • Copies of Annual Audit
Decommissioning Phase			
Environmental/Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan/indicator
Noise & Air pollution	<ul style="list-style-type: none"> • Maintain plant equipment. • Decommissioning works to be carried out only during daytime. • Workers working in noisy section to wear earmuffs. • Workers should be provided with dust masks. 	<ul style="list-style-type: none"> • Contractor • Management 	<ul style="list-style-type: none"> • Amount of noise
Disturbed Physical environment	<ul style="list-style-type: none"> • Undertake a complete environmental restoration programme and introducing appropriate vegetation 	<ul style="list-style-type: none"> • Management 	
Solid waste	<ul style="list-style-type: none"> • Solid waste should be collected by a contracted waste collection company • Excavation waste should be re-used or backfilled. 	<ul style="list-style-type: none"> • Contractor • Management 	<ul style="list-style-type: none"> • Amount of waste on Site. • Presence of well-maintained receptacles and central collection point.
Occupational Health and Safety	<ul style="list-style-type: none"> • Provide Personal Protective Equipment. • Train workers on personal safety and how to handle equipment and machines. • A well-stocked first aid kit shall be maintained by qualified personnel. • Demarcate area under decommissioning. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • Workers using Protective Equipment. • Presence of a First Aid Box.

6.5 Monitoring, Auditing and Reporting

6.5.1 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 enviro-legal requirements.

6.5.1.1 Internal Inspections/Audits

The following internal compliance monitoring programme will be implemented:

1. Project kick-off and close-out audits will be conducted on all contractors. This applies to all phases, including drilling contract work during operations:
 - Prior to a contractor beginning work, an audit will be conducted by the applicable phase site manager to ensure that the EMP commitments are included in Contractors' standard operating procedures (SOPs) and method statements.
 - 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.
2. Monthly internal EMP performance audits will be conducted during the construction/initial and decommissioning phases.
3. 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.

6.5.1.2 External Audits

- At the close of each project phase, and annually during the operational 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 mining operations. The proponent will be provided

with a written report of the findings of the inspection. These audits assist with the continual improvement of the mining project and the proponent will use such feedback to help improve its overall operations.

6.5.1.3 Documentation

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

6.5.1.4 Reporting

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

6.5.2 Environmental Management System Framework

In order to implement Environmental Management Practices, an 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 the following main categories:

6.5.2.1 Policy and Performance Standards

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

6.5.2.2 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 authorisations and permits will also be kept with the mining team. In addition, a register of the legislation and regulations applicable to the project will be maintained and updated as necessary.

6.5.2.3 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 is however 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. In this regard, the impact identification principles set forth in the scoping report can be used to update the Register. This method can be modified as required by the applicable manager as necessary during the life of the project.

6.5.2.3 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 mining 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.

6.5.2.4 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.

6.5.2.5 Site Map

An up to date map of the mining site indicating all project activities is to be maintained. In addition to the project layout, the following detail must be depicted:

-
- Materials handling and storage;
 - Waste management areas (collection, storage, transfer, etc.);
 - Sensitive areas;
 - Incident and emergency equipment locations; and Location of responsible parties.

6.5.2.6 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.

6.5.2.7 Change Management

The EMS must have a procedure in place for change management. In this regard, updating and revision of environmental documentation, of procedures and method statements, actions plants 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

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

6.6 Closure Plan

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. The aim of the closure plan is to:

- Creating a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation.
- Sustaining long term catchment yield and water quality.
- Focusing on establishing a functional post-prospecting landscape that enables self-sustaining agricultural practices where possible.
- To encourage, where appropriate, the re-instatement of terrestrial and aquatic wetland biodiversity

6.6.1 Alternatives Considered

Considering that this is a uniform mining project with no chemical processing involved, the proposed project is not complex, and the risks associated with prospecting are understood and can be mitigated at closure. Alternative options for closure are limited. There are only two options that have been considered as activity alternatives for the closure plan:

- **Preferred Alternative:** Closure or Backfill of trenches with overburden removed during mining.
- **Alternative 2:** To Leave trenches open, in-order to allow for groundwater recharge by surface run-off.

6.6.2 Preferred Alternative: Rehabilitation/ Backfill of boreholes

Rehabilitation is the restoration of a disturbed area that has been degraded as a result of activities such as mining, road construction or waste disposal, to a land use in conformity with the original land use before the activity started. This also includes aesthetical considerations, so that a disturbed area will not be visibly different to the natural environment. This also involves maintaining physical, chemical and biological ecosystem processes in degraded environments, hence the preferred option of backfilling the boreholes with the overburden removed during development and cover with growth medium to establish vegetation. This option has several advantages as discussed below:

Advantages:

- The site will be aesthetically acceptable;
- The site will blend in with the environment;
- The site will be a suitable habitat for fauna and flora again.
- The site will be safe and pollution free;
- Revegetating the site will ensure that the site is non-erodible.

Opting for alternative 1, which is to leave trenches without backfilling poses a risk in that, these boreholes may fill in with water, which may become attractive to wildlife and communities leading to drowning and the risk of being trapped in the declines. To mitigate these risks, it is necessary to backfill. Treatment technologies should be used to prevent decanting.

6.6.3 Closure Assumptions

This closure plan has been developed based on limited available information including environmental data. Some of the information currently available may need to be supplemented during the operational period. Therefore, several assumptions were made about general conditions, and closure and rehabilitation of the facilities at the site to develop the proposed closure actions. As additional information is collected during operations, these assumptions will be reviewed and revised as appropriate.

The assumptions used to prepare this plan include the following:

-
- The closure period will commence once the last planned weight of minerals has been extracted from the site.
 - The proposed mining sites will be adhered to minimise the potential impacts.
 - Vegetation establishment will be in line with a project area's indigenous vegetation.
 - Water management infrastructure developed for the operational phase will be retained for closure /end of the life of the project as necessary.
 - There are limited opportunities for any infrastructure to be built on site and if any infrastructure is built, it will be of limited benefit to the community. Therefore, all buildings will be demolished.
 - All hazardous and domestic waste will be transported offsite for disposal in licensed landfills.
 - No roads are anticipated to be constructed to access the site; existing roads will be used as far as possible. 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.

6.6.4 Closure and Rehabilitation Activities

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

6.6.4.1 Infrastructure

All infrastructures will be decommissioned, and the footprints rehabilitated for the establishment of vegetation. Material inventories will be managed near the end of mining activities to minimize any surplus materials at closure. Where practicable, equipment and materials with value not needed for post-closure operations will be sold and or removed from the site. Equipment with scrap or salvage value will be removed from the site and sold to recyclers.

A soil contamination investigation will be conducted on completion of demolition activities. The purpose of this is to identify areas of possible contamination and design

and implement appropriate remedial measures to ensure that the soil contaminants are removed. Closure actions will include:

- All power and water services to be disconnected and certified as safe prior to commencement of any decommissioning works;
- All remaining inert equipment and decommissioning waste will be disposed to the nearest licensed general waste disposal facility;
- Salvageable equipment will be removed and transported offsite prior and during decommissioning;
- All tanks, pipes and sumps containing hydrocarbons to be flushed or emptied prior to removal to ensure no hydrocarbon/chemical residue remains;

6.6.4.3 Roads

Existing roads will be used as far as possible. Closure actions concerning roads and parking areas will include:

- Removal of all signage, fencing, shade structures, traffic barriers, etc.
- All 'hard top' surfaces to be ripped along with any concrete structures.
- All potentially contaminated soils are to be identified and demarcated for later remediation; and
- All haul routes that have been treated with saline dust suppression water need to be treated, with the upper surface ripped and removed to designated contaminant disposal areas.

6.6.4.4 Remediation of Contaminated Areas

All soil, contaminated with hydrocarbons, will be identified, excavated, if possible, to at least 200 mm below the contaminated zone and then treated.

- All tanks, pipes and sumps containing hydrocarbons will be flushed or emptied.
- Removed soils will be managed as determined by the nature and extent of the contamination.

-
- Liquid storage tanks will be emptied, the structure removed/demolished and sub-surface holes filled; and
 - All equipment in which chemicals have been stored or transported will be cleaned and disposed of in a suitable disposal facility.

6.6.4.5 Vegetation

Successful revegetation will help control erosion of soil resources, maintain soil productivity and reduce sediment loading in streams utilizing non-invasive plants that fit the criteria of the habitat (e.g. soils, water availability, slope and other appropriate environmental factors). Invasive species will be avoided, and the area will be managed to control the spread of these species.

To counter the effects of erosion, naturally occurring grassland species will be planted on slopes. These species will provide soil holding capacity and reduce runoff velocity. The flatter areas will be re-vegetated with the objective of creating a sustainable ecosystem. The occurrence of protected plant species will need to be determined before vegetation is removed and the required permits will be obtained for either destruction or relocation.

6.6.4.6 Waste Management

Waste management activities will include:

- Hazardous waste will be managed handled, classified and disposed.
- Non-hazardous will be disposed in the nearby licensed landfill site;
- Scrap and waste steel will be sold to recyclers.
- It may be necessary to fence temporary salvage yards for security reasons, particularly where these are located close to public roads.

7. Public Participation Process

The public participation process commenced with a total of more than 4 newspaper advertisements in two widely distributed newspapers (New Era and the Windhoek Observer) for three consecutive weeks as shown in Appendix B.

Known interested and affected parties were notified directly via mail and fax. Posters were placed at the office of the Kunene Regional Council office and farm fences as well.

Interested and affected parties that were notified directly. No negative concerns were received at this stage. The registered interested and affected are indicated in the table below:

Table 11 Registered IAP's from various organs of state.

Name	Position	Organization
Teofillus Nghitila	Executive Director	Ministry of Environment and Tourism
Timoteus Mufeti	Environmental Commissioner	Ministry of Environment and Tourism
Maria Amakali	Director: Water Resources Management	Ministry of Agriculture, Water and Land Reform
E. Shivolo	Mining Commissioner	Min. of M&E - Mining Commissioner

Table 11 Registered IAP's and Summary of Issues Raised

Name	Organization	Tel	Email	Comments	Response
Charles Ngaveriange Uarije	Kunene Regional Council		cnuarije746@hotmail.com	How many people will the mine employ? Where will the water come from?	120 people. The water will come from boreholes.
Uatika Uaroua	Otjomaoru Village Head	0812307975		How will the community benefit?	From Corporate Social Responsibility Programs, employment and infrastructure development.
Uariongozu Tjihoto	Omivero Village Head	0812352758			
Tjiimena T. Kututa	Ondera Village Head	0812553370			
Ronney Tjihange	Otwani Village Head	0813495376			
Uahana Katjiri	Omao Village Head	0816315529			
Utjiuoue	Okazewana	081 986164			
Tjikundi Tjikuro		0817576423		This is a great initiative as there is high unemployment here. (Provided Consent Letter)	Thank you

8. Conclusion

The scoping report is prepared for the Environmental Impact Assessment for mining on an area which is located 57 km northeast of Opuwo. Environmental scoping is a critical step in the preparation of an EIA for the proposed mining activities.

With the potential employment of 120 people, this means that 120 families will benefit from the project during the mining phase. The project has great potential to improve livelihoods and contribute to sustainable development within the surrounding community.

At this stage, electricity requirements for the project are minimal. The bulk of the power supply to the mining site will be sourced from the proponent's own generator.

The potential negative impacts associated with the proposed mining project are expected to be low to medium in significance. Provided that the relevant mitigation measures are successfully implemented by the proponent, there are no environmental reasons why the proposed project should not be approved. The project will have significant positive economic impacts that would benefit the local, regional and national economy of Namibia.

Several other potential impacts have been addressed in Section 5 of this EIA, and will be managed through the implementation of the EMP.

The EMP contains a set of Environmental Specifications that will form part of all contracts between the proponent and contractors such as lubrication companies. The requirements of the EMP will be enforced on site by the Management team, and periodic environmental audits will be undertaken and submitted to MET.

This EIA has been subject to a few limitations, which are explained as follows: -

- the time available in which to secure an environmental contract with the authorities; and,

The limited botanical work done to date did not raise any concerns but will be monitored on an on-going basis. If any "special" species of plants are found, these will be located by GPS. An addendum will then be added to the EMP to indicate localities that should be avoided, or to implement other appropriate measures about any special plants.

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Appendix A

SCIENTIFIC NAME	COMMON NAME	STATUS	OCCURRENCE
<i>Eidolon helvum</i>	STRAW-COLORED FRUIT BAT	SECURE	SEASONAL
<i>Nycteris thebaica</i>	COMMON SLIT-FACED BAT	SECURE	ABUNDANTLY
<i>Taphozous mauritanus</i>	TOMB BAT	SECURE	SEASONAL
<i>Rhinolophus fumigatus</i>	RÜPPELL'S HORSESHOE BAT	SECURE	OCCASIONALLY
<i>Rhinolophus darlingi</i>	DARLING'S HORSESHOE BAT	SECURE	OCCASIONALLY
<i>Rhinolophus denti</i>	DENT'S HORSESHOE BAT	SECURE	OCCASIONALLY
<i>Hipposideros commersoni</i>	COMMERSON' S LEAF-NOSED BAT	SECURE	ABUNDANTLY
<i>Hipposideros caffer</i>	SUNDEVALL' S LEAF-NOSED BAT	SECURE	ABUNDANTLY
<i>Chaerephon nigeriae</i>	NIGERIAN FREE-TAILED BAT	SECURE	ABUNDANTLY
<i>Mops midas</i>	MIDAS FREE-TAILED BAT	SECURE	ABUNDANTLY
<i>Tadarida aegyptiaca</i>	EGYPTIAN FREE-TAILED BAT	SECURE	ABUNDANTLY
<i>Miniopterus inflatus</i>	GREATER LONG-FINGERED BAT	SECURE	RARELY
<i>Miniopterus schreibersi</i>	SCHREIBERS' LONG-FINGERED BAT	SECURE	ABUNDANTLY
<i>Neoromicia capensis</i>	CAPE SEROTINE BAT	SECURE	ABUNDANTLY
<i>Neoromicia zuluensis</i>	ALOE SEROTINE BAT	SECURE	RARELY
<i>Nycticeinops schlieffenii</i>	SCHLIEFFEN' S BAT	SECURE	RARELY
<i>Scotophilus dingani</i>	AFRICAN YELLOW BAT	SECURE	ABUNDANTLY
<i>Atelerix frontalis</i>	SOUTHERN AFRICAN HEDGEHOG	UNKNOWN, RARE?	RARELY
<i>Crociodura fuscomurina</i>	TINY MUSK SHREW	SECURE	RARELY
<i>Crociodura hirta</i>	LESSER RED MUSK SHREW	SECURE	ABUNDANTLY
<i>Galago moholi</i>	SOUTHERN AFRICAN BUSHBABY	UNKNOWN, RARE?	ABUNDANTLY
<i>Papio ursinus</i>	CHACMA BABOON	SECURE	ABUNDANTLY
<i>Lepus victoriae</i>		SECURE	ABUNDANTLY
<i>Xerus inaurus</i>	CAPE GROUND SQUIRREL	SECURE	ABUNDANTLY
<i>Funisciurus congicus</i>	STRIPED TREE SQUIRREL	SECURE	RARELY
<i>Saccostomus campestris</i>	POUCHED MOUSE	SECURE	ABUNDANTLY
<i>Tatera leucogaster</i>	BUSHVELD GERBIL	SECURE	ABUNDANTLY
<i>Tatera brantsii</i>	HIGHVELD GERBIL	SECURE	ABUNDANTLY
<i>Desmodillus auricularis</i>	SHORT-TAILED GERBIL	SECURE	RARELY
<i>Gerbillurus paeaba</i>	PYGMY GERBIL	SECURE	ABUNDANTLY
<i>Steatomys pratensis</i>	FAT MOUSE	SECURE	ABUNDANTLY
<i>Malacothrix typica</i>	LARGE-EARED MOUSE	SECURE	RARELY
<i>Mus indutus</i>	KALAHARI PYGMY MOUSE	SECURE	ABUNDANTLY
<i>Lemniscomys rosalia</i>	SINGLE-STRIPED MOUSE	SECURE	RARELY
<i>Rhabdomys pumilio</i>	STRIPED MOUSE	SECURE	ABUNDANTLY
<i>Thallomys paedulcus</i>	TREE RAT	SECURE	ABUNDANTLY
<i>Thallomys nigricauda</i>	BLACK-TAILED TREE RAT	SECURE	ABUNDANTLY
<i>Aethomys namaquensis</i>	NAMAQUA ROCK RAT	SECURE	RARELY
<i>Aethomys chrysophilus</i>	RED VELD RAT	SECURE	ABUNDANTLY
<i>Zelotomys woosnami</i>	WOOSNAM'S DESERT RAT	RARE	RARELY
<i>Mastomys natalensis</i>	NATAL MULTIMAMMATE MOUSE	SECURE	ABUNDANTLY
<i>Mastomys coucha</i>	MULTIMAMMATE MOUSE	SECURE	ABUNDANTLY
<i>Graphiurus murinus</i>	WOODLAND DORMOUSE	SECURE	ABUNDANTLY
<i>Pedetes capensis</i>	SPRINGHARE	SECURE	ABUNDANTLY
<i>Hystrix africaeaustralis</i>	SOUTHERN AFRICAN PORCUPINE	SECURE	ABUNDANTLY
<i>Cryptomys damarensis</i>	DAMARA MOLE RAT	SECURE	ABUNDANTLY
<i>Felis lybica</i>	AFRICAN WILD CAT	ENDANGERED & SUPERFICIAL	RARELY

<i>Felis nigripes</i>	SMALL - SPOTTED CAT	INDETERMINATE; PERIPHERAL; RARE?	RARELY
<i>Leptailurus serval</i>	SERVAL	AMBIGUOUS & SUPERFICIAL	RARELY
<i>Caracal caracal</i>	CARACAL	SECURE	ABUNDANTLY
<i>Panthera pardus</i>	LEOPARD	SECURE? & SUPERFICIAL	RARELY
<i>Panthera leo</i>	LION	AMBIGUOUS(END ANGERED) & SUPERFICIAL	EXTINCT
<i>Acinonyx jubatus</i>	CHEETAH	INADEQUATELY KNOWN (ENDANGERED?) & SUPERFICIAL	ABUNDANTLY
<i>Civettictis civetta</i>	CIVET	AMBIGUOUS, RARE? & SUPERFICIAL	RARELY
<i>Genetta maculata</i>	SMALL-SPOTTED GENET	SECURE – SP (taxonomy)	ABUNDANTLY
<i>Galarella sanguinea</i>	SLENDER MONGOOSE	SECURE	ABUNDANTLY
<i>Helogale parvula</i>	DWARF MONGOOSE	SECURE	ABUNDANTLY
<i>Mungos mungo</i>	BANDED MONGOOSE	SECURE	ABUNDANTLY
<i>Cynictis penicillata</i>	YELLOW MONGOOSE	SECURE	ABUNDANTLY
<i>Crocuta crocuta</i>	SPOTTED HYAENA	SECURE? & SUPERFICIAL	EXTINCT
<i>Parahyaena brunnea</i>	BROWN HYAENA	INADEQUATELY KNOWN (ENDANGERED?) & SUPERFICIAL	OCCASIONALLY
<i>Proteles cristatus</i>	AARDWOLF	INADEQUATELY KNOWN (ENDANGERED?) & SUPERFICIAL	ABUNDANTLY
<i>Canis mesomelas</i>	BLACK-BACKED JACKAL	SECURE	ABUNDANTLY
<i>Lycaon pictus</i>	WILD DOG	ENDANGERED & SUPERFICIAL	EXTINCT
<i>Otocyon megalotis</i>	BAT-EARED FOX	ENDANGERED? & SUPERFICIAL- SP (taxonomy)	RARELY
<i>Vulpes chama</i>	CAPE FOX	ENDANGERED?	RARELY
<i>Ictonyx striatus</i>	STRIPED POLECAT	SECURE	ABUNDANTLY
<i>Mellivora capensis</i>	HONEY BADGER	SECURE	RARELY
<i>Poecilogle albinucha</i>	AFRICAN STRIPED WEASEL	AMBIGUOUS(RAR E?)	RARELY
<i>Manis temminckii</i>	SAVANNA PANGOLIN	ENDANGERED & SUPERFICIAL	RARELY
<i>Phacochoerus africanus</i>	SOUTHERN WARTHOG	SECURE	ABUNDANTLY
<i>Giraffa camelopardalis</i>	GIRAFFE	ENDANGERED? & SUPERFICIAL	EXTINCT
<i>Alcelaphus buselaphus</i>	RED HARTEBEEST	SECURE ?	ABUNDANTLY
<i>Antidorcas marsupialis</i>	SPRINGBOK	SECURE	
<i>Connochaetes taurinus</i>	BLUE WILDEBEEST	INADEQUATELY KNOWN (ENDANGERED?) & SUPERFICIAL	ABUNDANTLY
<i>Hippotragus equinus</i>	ROAN	ENDANGERED & SUPERFICIAL	ABUNDANTLY
<i>Madoqua damarensis</i>	DAMARA DIK-DIK	INADEQUATELY KNOWN	RARELY
<i>Oryx gazella</i>	GEMSBOK	SECURE	ABUNDANTLY
<i>Raphicerus campestris</i>	STEENBOK	SECURE	ABUNDANTLY
<i>Sylvicapra grimmia</i>	COMMON DUIKER	SECURE	ABUNDANTLY
<i>Syncerus caffer</i>	BUFFALO	INSUFFICIENTLY KNOWN & SUPERFICIAL	ABUNDANTLY
<i>Tragelaphus oryx</i>	ELAND	INADEQUATELY KNOWN & SUPERFICIAL	ABUNDANTLY
<i>Tragelaphus strepsiceros</i>	GREATER KUDU	SECURE	ABUNDANTLY

<i>Equus burchelli</i>	PLAINS ZEBRA	INADEQUATELY KNOWN & SUPERFICIAL	EXTINCT
<i>Ceratotherium simum</i>	WHITE RHINOCEROS	EXTINCT & REINTRODUCED (non topotypical stock)	EXTINCT
<i>Diceros bicornis</i>	BLACK RHINOCEROS	ENDANGERED & SUPERFICIAL	EXTINCT
<i>Loxodonta africana</i>	AFRICAN ELEPHANT	ENDANGERED & SUPERFICIAL	EXTINCT
<i>Orycteropus afer</i>	AARDVARK	SECURE ?	ABUNDANTLY
<i>Elephantulus intufi</i>	BUSHVELD SENGI	ENDEMIC AND SECURE	ABUNDANTLY

Reptile species which are likely to occur within the exploration area:

SCIENTIFIC NAME	COMMON NAME	STATUS	OCCURRENCE
<i>Pelomedusa subrufa</i>	HELMETED TERRAPIN	SECURE	ABUNDANTLY
<i>Geochelone pardalis</i>	LEOPARD TORTOISE	ENDANGERED & SUPERFICIAL	ABUNDANTLY
<i>Psammobates oculiferus</i>	KALAHARI TORTOISE	ENDANGERED	ABUNDANTLY
<i>Lygodactylus bradfieldi</i>	NAMIBIAN DWARF GECKO	ENDEMIC & SECURE	ABUNDANTLY
<i>Colopus wahlbergii</i>	KALAHARI GROUND GECKO	SECURE	RARELY
<i>Pachydactylus turneri</i>	TROPICAL BUTTON-SCALE GECKO	SECURE	ABUNDANTLY
<i>Pachydactylus capensis</i>	CAPE GECKO	SECURE	UNCOMMONLY
<i>Pachydactylus punctatus</i>	SPECKLED GECKO	SECURE	ABUNDANTLY
<i>Ptenopus garrulus</i>	COMMON BARKING GECKO	SECURE	ABUNDANTLY
<i>Agama aculeata</i>	COMMON GROUND AGAMA	SECURE	ABUNDANTLY
<i>Chamaeleo dilepis</i>	FLAP-NECK CHAMELEON	SECURE	ABUNDANTLY
<i>Acontias occidentalis</i>	WESTERN LEGLESS SKINK	SECURE	ABUNDANTLY
<i>Lygosoma sundevalli</i>	COMMON WRITHING SKINK	SECURE	ABUNDANTLY
<i>Trachylepis capensis</i>	CAPE SKINK	SECURE	UNCOMMONLY
<i>Trachylepis punctulata</i>	EASTERN VARIEGATED SKINK	SECURE	ABUNDANTLY
<i>Trachylepis wahlbergii</i>	WAHLBERG'S STRIPED SKINK	SECURE	ABUNDANTLY
<i>Trachylepis varia</i>	COMMON VARIABLE SKINK	SECURE	ABUNDANTLY
<i>Heliobolis lugubris</i>	BUSHVELD LIZARD	SECURE	ABUNDANTLY
<i>Ichnotropis capensis</i>	CAPE ROUGH-SCALED LIZARD	SECURE	ABUNDANTLY
<i>Ichnotropis squamulosa</i>	COMMON ROUGH-SCALED LIZARD	SECURE	ABUNDANTLY
<i>Nucras holubi</i>	HOLUB'S SANDVELD LIZARD	SECURE	UNCOMMONLY
<i>Nucras intertexta</i>	SPOTTED SANDVELD LIZARD	SECURE	UNCOMMONLY
<i>Pedioplanis lineocellata</i>	OCELLATED SAND LIZARD	SECURE	ABUNDANTLY
<i>Pedioplanis namaquensis</i>	NAMAQUA SAND LIZARD	SECURE	ABUNDANTLY
<i>Gerrhosaurus auritus</i>	KALAHARI PLATED LIZARD	SECURE	UNCOMMONLY
<i>Gerrhosaurus nigrolineatus</i>	BLACK-LINED PLATED LIZARD	SECURE	ABUNDANTLY
<i>Varanus albigularis</i>	VELD LEGUAAN (MONITOR)	ENDANGERED & SUPERFICIAL	ABUNDANTLY
<i>Dalophia pistillum</i>	BLUNT-TAILED WORM LIZARD	SECURE ?	MARGINALLY
<i>Monopeltis anchietae</i>	ANGOLAN SPADE-SNOUTED WORM LIZARD	SECURE	ABUNDANTLY
<i>Monopeltis infuscata</i>	DUSKY SPADE-SNOUTED WORM LIZARD	SECURE	ABUNDANTLY
<i>Monopeltis leonhardi</i>	KALAHARI SPADE-SNOUTED WORM LIZARD	SECURE	MARGINALLY
<i>Monopeltis mauricei</i>	SLENDER SPADE-SNOUTED WORM LIZARD	SECURE	MARGINALLY
<i>Zygaspis quadrifrons</i>	KALAHARI ROUND-HEADED WORM LIZARD	SECURE	ABUNDANTLY
<i>Leptotyphlops labialis</i>	DAMARA WORM SNAKE	ENDEMIC & SECURE	MARGINALLY
<i>Leptotyphlops scutifrons</i>	PETERS= WORM SNAKE	SECURE	ABUNDANTLY
<i>Rhinotyphlops schlegelii</i>	SCHLEGEL'S BLIND SNAKE	SECURE	ABUNDANTLY
<i>Rhinotyphlops boylei</i>	KALAHARI BLIND SNAKE	SECURE	RARELY

<i>Python natalensis</i>	SOUTHERN AFRICAN PYTHON	ENDANGERED & SUPERFICIAL	ABUNDANTLY
<i>Amblyodipsas polylepis</i>	COMMON PURPLE-GLOSSED SNAKE	INADEQUETLY KNOWN; RARE?	RARELY
<i>Amblyodipsas ventrimaculata</i>	KALAHARI PURPLE-GLOSSED SNAKE	SECURE	MARGINALLY
<i>Aparallactus capensis</i>	CAPE CENTIPEDE EATER	INADEQUETLY KNOWN ; RARE?	RARELY
<i>Atractaspis bibronii</i>	SOUTHERN STILLETTO SNAKE	SECURE	ABUNDANTLY
<i>Xenocalamus bicolor</i>	VARIABLE QUILL-SNOURED SNAKE	SECURE	ABUNDANTLY
<i>Xenocalamus mechowii</i>	ELONGATED QUILL-SNOURED SNAKE	SECURE	MARGINALLY
<i>Crotaphopeltis hotamboeia</i>	WHITE-LIPPED SNAKE	INADEQUETLY KNOWN	RARELY
<i>Dasypeltis scabra</i>	RHOMBIC EGG EATER	SECURE	ABUNDANTLY
<i>Dispholidus typus</i>	BOOMSLANG	SECURE	ABUNDANTLY
<i>Lamprophis fuliginosus</i>	BROWN HOUSE SNAKE	SECURE	ABUNDANTLY
<i>Lycophidion capense</i>	CAPE WOLF SNAKE	SECURE	ABUNDANTLY
<i>Mehelya capensis</i>	CAPE FILE SNAKE	SECURE	UNCOMMONLY
<i>Mehelya nyassae</i>	BLACK FILE SNAKE	INADEQUETLY KNOWN	RARELY
<i>Mehelya vernayi</i>	ANGOLAN FILE SNAKE	INADEQUETLY KNOWN	UNCOMMONLY
<i>Philothamnus angolensis</i>	ANGOLAN GREEN SNAKE	SECURE	UNCOMMONLY
<i>Philothamnus semivariiegatus</i>	SPOTTED BUSH SNAKE	SECURE	ABUNDANTLY
<i>Prosymna angolensis</i>	ANGOLA SHOVEL-SNOOUT	SECURE	MARGINALLY
<i>Prosymna bivittata</i>	TWIN-STRIPED SHOVELSNOOUT	SECURE	MARGINALLY
<i>Psammophis angolensis</i>	DWARF WHIP SNAKE	SECURE	ABUNDANTLY
<i>Psammophis jallae</i>	JALLA'S SAND SNAKE	INADEQUETLY KNOWN	RARELY
<i>Psammophis leopardinus</i>	LEOPARD WHIP SNAKE	ENDEMIC & SECURE	UNCOMMONLY
<i>Psammophis mossambicus</i>	OLIVE WHIP SNAKE	SECURE	ABUNDANTLY
<i>Psammophis notostictus</i>	KAROO WHIP SNAKE	SECURE	MARGINALLY
<i>Psammophis subtaeniatus</i>	WESTERN STRIPED-BELLIED SAND SNAKE	SECURE	ABUNDANTLY
<i>Psammophis trigrammus</i>	WESTERN WHIP SNAKE	ENDEMIC & SECURE	ABUNDANTLY
<i>Psammophis trinasalis</i>	KALAHARI SAND SNAKE	SECURE	UNCOMMONLY
<i>Psammophylax tritaeniatus</i>	STRIPED SKAAPSTEKER	SECURE	ABUNDANTLY
<i>Pseudaspis cana</i>	MOLE SNAKE	SECURE	ABUNDANTLY
<i>Telescopus semiannulatus</i>	SOUTHERN TIGER SNAKE	SECURE	ABUNDANTLY
<i>Thelotornis capensis</i>	VINE SNAKE	SECURE	UNCOMMONLY
<i>Aspidelaps lubricus</i>	CORAL SNAKE	SECURE	UNCOMMONLY
<i>Aspidelaps scutatus</i>	SHIELD-NOSE SNAKE	SECURE	ABUNDANTLY
<i>Dendroaspis polylepis</i>	BLACK MAMBA	SECURE	ABUNDANTLY
<i>Elapsoidea semiannulata</i>	ANGOLA GARTER SNAKE	SECURE	UNCOMMONLY
<i>Elapsoidea sundevallii</i>	KALAHARI GARTER SNAKE	SECURE	UNCOMMONLY
<i>Naja anchietae</i>	ANGOLAN COBRA	SECURE	ABUNDANTLY
<i>Naja mossambica</i>	MOZAMBIQUE SPITTING COBRA	SECURE	RARELY
<i>Naja nigricincta</i>	ZEBRA SNAKE	ENDEMIC & SECURE	ABUNDANTLY
<i>Bitis caudalis</i>	HORNED ADDER	SECURE	UNCOMMONLY
<i>Bitis arietans</i>	PUFF ADDER	SECURE	ABUNDANTLY

Bird species which are likely to occur within the project area:

SCIENTIFIC NAME	COMMON NAME	STATUS IN NAMIBIA
<i>Accipiter badius</i>	Little Banded Goshawk	Secure
<i>Accipiter ovampensis</i>	Ovambo Sparrowhawk	Secure
<i>Actophilornis africanus</i>	African Jacana	Secure
<i>Agapornis roseicollis</i>	Rosy faced Lovebird	Secure
<i>Anastomus lamelligerus</i>	Openbilled Stork	Secure
<i>Anthus cinnamomeus</i>	Richard's Pipit	Secure
<i>Apus affinis</i>	Little Swift	Secure
<i>Apus apus</i>	European Swift	Secure

<i>Apus caffer</i>	Whiterumped Swift	Secure
<i>Apus melba</i>	Alpine Swift	Secure
<i>Aquila nipalensis</i>	Steppe Eagle	Secure -
<i>Aquila rapax</i>	Tawny Eagle	Endangered
<i>Aquila wahlbergi</i>	Wahlberg's Eagle	Secure
<i>Ardeotis kori</i>	Kori Bustard	Secure
<i>Batis molitor</i>	Chinspot Batis	Secure
<i>Batis pririt</i>	Pirit Batis	Secure
<i>Bubalornis niger</i>	Redbilled Buffalo Weaver	Secure
<i>Burhinus capensis</i>	Spotted Dikkop	Secure
<i>Buteo buteo</i>	Steppe Buzzard	Secure -
<i>Calamonastes fasciolatus</i>	Barred Warbler	Secure
<i>Calendulauda sabota</i>	Sabota Lark	Secure
<i>Camaroptera brevicaudata</i>	Greybacked Camaroptera	Secure
<i>Caprimulgus pectoralis</i>	Fierynecked Nightjar	Secure
<i>Caprimulgus rufigena</i>	Rufouscheeked Nightjar	Secure
<i>Ceryle rudis</i>	Pied Kingfisher	Secure
<i>Chrysococcyx caprius</i>	Diederik Cuckoo	Secure
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	Secure
<i>Ciconia abdimii</i>	Abdim's Stork	Secure
<i>Cinnyris mariquensis</i>	Marico Sunbird	Secure
<i>Circaetus pectoralis</i>	Blackbreasted Snake Eagle	Secure
<i>Cisticola chiniana</i>	Rattling Cisticola	Secure
<i>Cisticola rufilatus</i>	Tinkling Cisticola	Secure
<i>Clamator glandarius</i>	Great Spotted Cuckoo	Secure
<i>Coracias caudata</i>	Lilacbreasted Roller	Secure
<i>Coracias garrulus</i>	European Roller	Secure -
<i>Coracias naevia</i>	Purple Roller	Secure
<i>Corvinella melanoleuca</i>	Longtailed Shrike	Secure
<i>Corvus capensis</i>	Black Crow	Secure
<i>Corythaixoides concolor</i>	Grey Lourie	Secure
<i>Creatophora cinerea</i>	Wattled Starling	Secure
<i>Crithagra flaviventris</i>	Yellow Canary	Secure
<i>Cuculus clamosus</i>	Black Cuckoo	Secure
<i>Cuculus gularis</i>	African Cuckoo	Secure
<i>Cursorius temminckii</i>	Temminck's Courser	Secure
<i>Cypsiurus parvus</i>	Palm Swift	Secure
<i>Delichon urbicum</i>	House Martin	Secure -
<i>Dicrurus adsimilis</i>	Forktailed Drongo	Secure
<i>Elanus caeruleus</i>	Blackshouldered Kite	Secure
<i>Emberiza flaviventris</i>	Goldenbreasted Bunting	Secure
<i>Emberiza tahapis</i>	Rock Bunting	Secure
<i>Eremomela icteropygialis</i>	Yellowbellied Eremomela	Secure
<i>Eremopterix verticalis</i>	Greybacked Finchlark	Secure
<i>Erythropgia leucophrys</i>	Whitebrowed Robin	Secure
<i>Erythropgia paena</i>	Kalahari Robin	Secure
<i>Estrilda erythronotos</i>	Blackcheeked Waxbill	Secure
<i>Eupodotis afraoides</i>	Whitequilled Korhaan	Secure
<i>Eupodotis ruficrista</i>	Redcrested Korhaan	Secure
<i>Eurocephalus anguitemens</i>	Whitecrowned Shrike	Secure
<i>Falco biarmicus</i>	Lanner Falcon	Secure
<i>Falco chicquera</i>	Rednecked Falcon	Secure
<i>Falco subbuteo</i>	Hobby Falcon	Secure -
<i>Falco tinnunculus</i>	Rock Kestrel	Secure
<i>Falco vespertinus</i>	Western Redfooted Kestrel	Secure
<i>Francolinus adspersus</i>	Redbilled Francolin	Secure
<i>Francolinus sephaena</i>	Crested Francolin	Secure
<i>Francolinus swainsonii</i>	Swainson's Francolin	Secure
<i>Gallinago nigripennis</i>	Ethiopian Snipe	Secure
<i>Gyps africanus</i>	Whitebacked Vulture	Near Threatened
<i>Hieraaetus pennatus</i>	Booted Eagle	Endangered
<i>Hirundo abyssinica</i>	Lesser Striped Swallow	Secure

<i>Hirundo cucullata</i>	Greater Striped Swallow	Secure
<i>Hirundo fuligula</i>	Rock Martin	Secure
<i>Hirundo rustica</i>	European Swallow	Secure -
<i>Hirundo semirufa</i>	Redbreasted Swallow	Secure
<i>Lamprotonis australis</i>	Burchell's Starling	Secure
<i>Lamprotonis nitens</i>	Glossy Starling	Secure
<i>Laniarius atrococcineus</i>	Crimsonbreasted Shrike	Secure
<i>Lanius collaris</i>	Fiscal Shrike	Secure
<i>Lanius collurio</i>	Redbacked Shrike	Secure -
<i>Lanius minor</i>	Lesser Grey Shrike	Secure -
<i>Melaenornis infuscatus</i>	Chat Flycatcher	Secure
<i>Melaenornis mariquensis</i>	Marico Flycatcher	Secure
<i>Melierax canorus</i>	Pale Chanting Goshawk	Secure
<i>Merops apiaster</i>	European Bee-Eater	Secure -
<i>Merops hirundineus</i>	Swallowtailed Bee-Eater	Secure
<i>Micronisus gabar</i>	Gabar Goshawk	Secure
<i>Milvus migrans</i>	Black Kite	Secure -
<i>Milvus parasitus</i>	Yellowbilled Kite	Secure
<i>Mirafra passerina</i>	Monotonous Lark	Secure
<i>Monticola brevipes</i>	Shorttoed Rock Thrush	Secure
<i>Muscicapa striata</i>	Spotted Flycatcher	Secure -
<i>Nectarinia fusca</i>	Dusky Sunbird	Secure
<i>Nectarinia talatala</i>	Whitebellied Sunbird	Secure
<i>Nilaus afer</i>	Brubru	Secure
<i>Numida meleagris</i>	Helmeted Guineafowl	Secure
<i>Oena capensis</i>	Namaqua Dove	Secure
<i>Onychognathus naboroupp</i>	Palewinged Starling	Secure
<i>Parisoma subcaeruleum</i>	Titbabbler	Secure
<i>Parus cinerascens</i>	Ashy Tit	Secure
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	Secure
<i>Passer motitensis</i>	Great Sparrow	Secure
<i>Plocepasser mahali</i>	Whitebrowed Sparrowweaver	Secure
<i>Ploceus velatus</i>	Masked Weaver	Secure
<i>Polemaetus bellicosus</i>	Martial Eagle	Endangered
<i>Polihierax semitorquatus</i>	Pygmy Falcon	Secure
<i>Prinia flavicans</i>	Blackchedsted Prinia	Secure
<i>Psophocichla litsitsirupa</i>	Groundscraper Thrush	Secure
<i>Pterocles bicinctus</i>	Doublebanded Sandgrouse	Secure
<i>Pterocles namaqua</i>	Namaqua Sandgrouse	Secure
<i>Pycnonotus nigricans</i>	Redeyed Bulbul	Secure
<i>Pytilia melba</i>	Melba Finch	Secure
<i>Quelea quelea</i>	Redbilled Quelea	Secure
<i>Rhinopomastus cyanomelas</i>	Scimitar-billed Woodhoopoe	Secure
<i>Rhinoptilus chalcopterus</i>	Bronzewinged Courser	Secure
<i>Scopus umbretta</i>	Hamerkop	Secure
<i>Serinus atrogularis</i>	Blackthroated Canary	Secure
<i>Smutsornis africanus</i>	Doublebanded Courser	Secure
<i>Sporopipes squamifrons</i>	Scalyfeathered Finch	Secure
<i>Streptopelia capicola</i>	Cape Turtle Dove	Secure
<i>Streptopelia senegalensis</i>	Laughing Dove	Secure
<i>Struthio camelus</i>	Ostrich	Secure
<i>Sylvietta rufescens</i>	Longbilled Crombec	Secure
<i>Tchagra australis</i>	Threestreaked Tchagra	Secure
<i>Terathopius ecaudatus</i>	Bateleur	Endangered
<i>Thripias namaquus</i>	Bearded Woodpecker	Secure
<i>Tockus erythrorhynchus</i>	Redbilled Hornbill	Secure
<i>Tockus leucomelas</i>	Southern Yellowbilled Hornbill	Secure
<i>Tockus nasutus</i>	Grey Hornbill	Secure
<i>Torgos tracheliotus</i>	Lappetfaced Vulture	Vulnerable
<i>Tricholaema leucomelas</i>	Pied Barbet	Secure
<i>Turdoides bicolor</i>	Pied Babbler	Secure
<i>Turtur chalcospilos</i>	Greenspotted Dove	Secure

<i>Upupa epops</i>	Hoopoe	Secure
<i>Uraeginthus angolensis</i>	Blue Waxbill	Secure
<i>Uraeginthus granatinus</i>	Violeteared Waxbill	Secure
<i>Urocolius indicus</i>	Redfaced Mousebird	Secure
<i>Vanellus armatus</i>	Blacksmith Plover	Secure
<i>Vanellus coronatus</i>	Crowned Plover	Secure
<i>Vanellus senegallus</i>	Wattled Plover	Secure
<i>Vidua regia</i>	Shafttailed Whydah	Secure
<i>Zosterops senegalensis</i>	Yellow White-Eye	Secure

Appendix B: Proof of Advertisements, Letters and Notices

Appendix of CV's

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL
EXPLORATION ON EPL 8644**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 40 km north of Mariental, accessible along the C21 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 13/09/2022. Contact details for registration and further information:

Impala Environmental Consulting
Mr. S. Andjamba
Email: eia@impalac.com, Tel: 0856630598



**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
MINERAL EXPLORATION ON EPL 8645**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 90 km southeast of Rehoboth, accessible along the C25 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 13/09/2022. Contact details for registration and further information:

Ms. Nangula
Email: info@enviro-aec.com, Tel: 0857728929

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED CONSTRUCTION OF A POWERLINE,
PIPELINE AND ROAD IN SUPPORT OF TANTALITE
MINING ON ML 223**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderzit.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderzit.

Proponent: Orange River Pegmatite (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 12/09/2022. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba.
Email: eia@impalac.com, Tel: 0856630598



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CALL FOR PUBLIC PARTICIPATION

**ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED COPPER MINING ON ML 248 & 249**

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omarandui settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before 16/09/2022.

Contact details:

Mr. S Andjamba
Email: eia@impalac.com
Tel: + 264856630598



**MUNICIPALITY OF HENTIES BAY
NOTICE**



**INTENTION TO ALIENATE A PORTION 117 (SITUATED SOUTH DUINE) OF THE FARM OF
HENTIESBAAI TOWNLAND NO.133 MESSRS NERAL INVESTMENT**

By virtue of Council Resolution, C01023106/202205*2022 and in terms of Section 63 (2)(b) of the Local Authorities Act, (Act 23 of 1992) as amended, read in conjunction with Section 30 (1)(f) of the Local Authorities Act 1992 (Act 23 of 1992) as amended, notice is hereby given that the Municipal Council of Hentiesbaai intends to alienate portion 117 of Hentiesbaai Town and Townlands no.133, measuring 25 Hectares (Equivalent to 250 000m²) at a cost of N\$ 15.00 /m² amounting to a total purchase price of N\$ 3 750 000.00 (Three Million, Seven Hundred & Fifty Thousand Namibian Dollars), by way of private treaty to Messrs Neral Investment for the purpose of establishing a Housing development.

Further take note that the locality and the layout plan of the property lies open for inspection during office hours at the offices of the Municipal Council situated at the corner of Jakobspütz Road and Nicky Jumbo Avenue.

Any person(s) having objection(s) to the intended alienation of the portion may lodge such objection(s) fully motivated to the undersigned, within fourteen (14) days after the second placement of the advert.

Chief Executive Officer
P O Box 61
Henties Bay

CLASSIFIEDS

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 8644

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 40 km north of Mariental, accessible along the C21 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **13/09/2022**. Contact details for registration and further information:

Impala Environmental Consulting

Mr. S. Andjamba

Email: eia@impalac.com, Tel: 0856630598



CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 8645

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 90 km southeast of Rehoboth, accessible along the C25 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **13/09/2022**. Contact details for registration and further information:

Ms. Nangula

Email: info@enviro-aec.com, Tel: 0857728929

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF A POWERLINE, PIPELINE AND ROAD IN SUPPORT OF TANTALITE MINING ON ML 223

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderzit.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderzit.

Proponent: Orange River Pegmatite (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **12/09/2022**. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba.

Email: eia@impalac.com, Tel: 0856630598



Teamed West Medical Distributors Africa (Pty) Ltd has the following vacancy available:

TECHNICAL ASSISTANT REQUIRED

As a well-established Medical Engineering Company, we have a vacancy available that requires a highly qualified and experienced Resident Engineer / Technical Assistant.

Applicants should have experience in the fields of the following medical equipment:

Basic X Rays
Digital X-Rays
CR Imaging
DR Imaging
Mammography
Angiography
Computerized Tomography (CT)
Magnetic Resonance Imaging (MRI)
Orthography
Ultrasound
Patient Monitoring
Theatre Equipment

Minimum Requirements:

*An appropriated qualification - 4 years National Diploma in Electrical or Bachelor of Engineering in Electrical
* At least 5 (five) years in technical / engineering of work experience on the above products

Please note that Teamed West Medical Distributors Africa (Pty) Ltd will give preference to suitable qualified Namibian candidates.

If you are interested in the position, please send your detailed resume and relevant supporting documentation (copy of ID, qualification, etc) to naamb@teamed.co.na by latest 31 August 2022 (closing date).

IMPORTANT NOTE: Only the successful/short listed candidates will be contacted.

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED COPPER MINING ON ML 248 & 249

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Ombarandu settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:

Mr. S Andjamba

Email: cia@impalac.com

Tel: + 264856630598



MUNICIPALITY OF HENTIES BAY NOTICE



INTENTION TO ALIENATE A PORTION 117 (SITUATED SOUTH DUNE) OF THE FARM OF HENTIESBAAI TOWNLAND NO.133 MESSRS NERAL INVESTMENT

By virtue of Council Resolution C610/23/06/202205*2022 and in terms of Section 63 (2)(b) of the Local Authorities Act, (Act 23 of 1992) as amended, read in conjunction with Section 30 (1)(i) of the Local Authorities Act 1992 (Act 23 of 1992) as amended, notice is hereby given that the Municipal Council of Hentiesbaai intends to alienate portion 117 of Hentiesbaai Town and Townlands no.133, measuring 25 Hectares (Equivalent to 250 000m²) at a cost of N\$ 15.00 m² amounting to a total purchase price of N\$ 3 750 000.00 (Three Million, Seven Hundred & Fifty Thousand Namibian Dollars), by way of private treaty to Messrs Neral Investment for the purpose of establishing a Housing development.

Further take note that the locality and the layout plan of the property lies open for inspection during office hours at the offices of the Municipal Council situated at the corner of Jakobsputz Road and Nicky-Iyambo Avenue.

Any person(s) having objection(s) to the intended alienation of the portion may lodge such objection(s) fully motivated to the undersigned, within fourteen (14) days after the second placement of the advert.

Chief Executive Officer

P O Box 61

Henties Bay

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL
EXPLORATION ON EPL 8644**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 40 km north of Mariental, accessible along the C21 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 13/09/2022. Contact details for registration and further information:

Impala Environmental Consulting
Mr. S. Andjamba
Email: eia@impalac.com, Tel: 0856630598



**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
MINERAL EXPLORATION ON EPL 8645**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 90 km southeast of Rehoboth, accessible along the C25 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 13/09/2022. Contact details for registration and further information:

Ms. Nangula
Email: info@enviro-aec.com, Tel: 0857728929

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED CONSTRUCTION OF A POWERLINE,
PIPELINE AND ROAD IN SUPPORT OF TANTALITE
MINING ON ML 223**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderzit.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderzit.

Proponent: Orange River Pegmatite (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 12/09/2022. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba.
Email: eia@impalac.com, Tel: 0856630598



Techned West Medical Distributors Africa (Pty) Ltd has the following vacancy available:

TECHNICAL ASSISTANT REQUIRED

As a well-established Medical Engineering Company, we have a vacancy available that requires a highly qualified and experienced Resident Engineer / Technical Assistant.

Applicants should have experience in the fields of the following medical equipment:

- Basic X-Rays
- Angiogram X-Rays
- CR Imaging
- DR Imaging
- Mammography
- Angiography
- Computerized Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Oncology
- Life Support
- Medical Imaging
- Theatre Equipment

Minimum Requirements:

- *An appropriated qualification - 4 years National Diploma in Electrical or Bachelor of Engineering in Electrical
- * At least 5 (five) years in technical / engineering of work experience on the above products

Please note that Techned West Medical Distributors Africa (Pty) Ltd will give preference to suitable qualified Namibian candidates.

If you are interested in the position, please send your detailed resume and relevant supporting documentation (copy of ID, qualification, etc) to naamba@tmed.com.na by latest 31 August 2022 (closing date).

IMPORTANT NOTE: Only the successful/short listed candidates will be contacted.

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED COPPER MINING ON ML 248 & 249**

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omararand settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:

Mr. S Andjamba
Email: eia@impalac.com
Tel: + 264856630598



**MUNICIPALITY OF HENTIES BAY
NOTICE**



INTENTION TO ALIENATE A PORTION 117 (SITUATED SOUTH DUINE) OF THE FARM OF HENTIESBAAI TOWNLAND NO.133 MESSRS NERAL INVESTMENT

By virtue of Council Resolution C010/23/06/202205th2022 and in terms of Section 63 (2)(b) of the Local Authorities Act, (Act 23 of 1992) as amended, read in conjunction with Section 30 (1)(i) of the Local Authorities Act 1992 (Act 23 of 1992) as amended, notice is hereby given that the Municipal Council of Hentiesbaai intends to alienate portion 117 of Hentiesbaai Town and Townlands no.133, measuring 25 Hectares (Equivalent to 250 000m²) at a cost of NS 15,00 /m² amounting to a total purchase price of NS 3 750 000,00 (Three Million, Seven Hundred & Fifty Thousand Namibian Dollars), by way of private treaty to Messrs Neral Investment for the purpose of establishing a Housing development.

Further take note that the locality and the layout plan of the property lies open for inspection during office hours at the offices of the Municipal Council situated at the corner of Jakobspuutj Road and Nicky Jyambo Avenue.

Any person(s) having objection(s) to the intended alienation of the portion may lodge such objection(s) (fully motivated to the undersigned, within fourteen (14) days after the second placement of the advert.

Chief Executive Officer
P O Box 61
Henties Bay

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL
EXPLORATION ON EPL 8644**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 40 km north of Mariental, accessible along the C21 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **13/09/2022**. Contact details for registration and further information:

Impala Environmental Consulting
Mr. S. Andjamba
Email: eia@impalac.com, Tel: 0856630598



**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
MINERAL EXPLORATION ON EPL 8645**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012).

Project: The license area is located about 90 km southeast of Rehoboth, accessible along the C25 road. The proponent intends to explore for Lithium. Exploration methods may include geological mapping, geophysical surveys, sampling, and drilling.

Proponent: Mr. Lisias Pius

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **13/09/2022**. Contact details for registration and further information:

Ms. Nangua
Email: info@enviro-aec.com, Tel: 0857728929

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED CONSTRUCTION OF A POWERLINE,
PIPELINE AND ROAD IN SUPPORT OF TANTALITE
MINING ON ML 223**

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderziti.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderziti.

Proponent: Orange River Pegmatite (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **12/09/2022**. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba.
Email: eia@impalac.com, Tel: 0856630598



Tecmed West Medical Distributors Africa (Pty) Ltd has the following vacancy available:

TECHNICAL ASSISTANT REQUIRED

As a well-established Medical Engineering Company, we have a vacancy available that requires a highly qualified and experienced Resident Engineer / Technical Assistant.

Applicants should have experience in the fields of the following medical equipment:

- Basic X-Rays
- Digital X-Rays
- CR Imaging
- DR Imaging
- Amnionography
- Angiography
- Computed Tomography (CT)
- Magnetic Resonance Imaging (MRI)
- Oncology
- Life Support
- Patient Monitoring
- Theatre Equipment

Minimum Requirements:
* An appropriate qualification - 4 years National Diploma in Electrical or Bachelor of Engineering in Electrical
* At least 5 (five) years in technical / engineering of work experience on the above products

Please note that Tecmed West Medical Distributors Africa (Pty) Ltd will give preference to suitable qualified Namibian candidates.

If you are interested in the position, please send your detailed resume and relevant supporting documentation (copy of ID, qualification, etc) to naamb@tecmed.co.za by latest 31 August 2022 (closing date).

IMPORTANT NOTE: Only the successful/short listed candidates will be contacted.

**CALL FOR PUBLIC PARTICIPATION
ENVIRONMENTAL IMPACT ASSESSMENT FOR
PROPOSED COPPER MINING ON ML 248 & 249**

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omarurandu settlement area, within the Kunene Region.

Proponent: Shiloom Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:

Mr. S Andjamba
Email: eia@impalac.com
Tel: + 264856630598



**MUNICIPALITY OF HENTIES BAY
NOTICE**



INTENTION TO ALIENATE A PORTION 117 (SITUATED SOUTH DUINE) OF THE FARM OF HENTIESBAAI TOWNLAND NO.133 MESSRS NERAL INVESTMENT

By virtue of Council Resolution C01023/06/202205th and in terms of Section 63 (2)(b) of the Local Authorities Act, (Act 23 of 1992) as amended, read in conjunction with Section 30 (1)(i) of the Local Authorities Act, (Act 23 of 1992) as amended, notice is hereby given that the Municipal Council of Hentiesbaai intends to alienate portion 117 of Hentiesbaai Town and Townlands no.133, measuring 25 Hectares (Equivalent to 250 000m²) at a cost of NS 15.00 /m² amounting to a total purchase price of NS 3 750 000.00 (Three Million, Seven Hundred & Fifty Thousand Namibian Dollars), by way of private treaty to Messrs Neral Investment for the purpose of establishing a Housing development.

Further take note that the locality and the layout plan of the property lies open for inspection during office hours at the offices of the Municipal Council situated at the corner of Jakkalsputz Road and Nickey Yamba Avenue.

Any person(s) having objection(s) to the intended alienation of the portion may lodge such objection(s) fully motivated to the undersigned, within fourteen (14) days after the second placement of the advert.

Chief Executive Officer
P O Box 61
Henties Bay



Republic of Namibia

OFFICE OF THE PRIME MINISTER

DIVISION: POLICY AND PROGRAMME COORDINATION

Post : Economist Grade 8
1x post : Windhoek
Salary scale : N\$220,828 – 263, 911
Housing Allowance : N\$13,080 per annum
Transport Allowance : N\$7,680 per annum

Minimum requirements: A Bachelor Degree in Economics or an equivalent qualification on NQF level 7 with major subjects in Economics and/ or Public Policy. Applicants must demonstrate knowledge of economic and financial analysis.

Key Performance Areas:

- Undertake economic and financial analysis of projects.
- Prepare concepts notes on projects
- Assist with monitoring and evaluation of various projects.
- Assist the Division/Office with the coordination of its functions and liaise with other O/M/As in order to fast-track the implementation of projects, programmes and activities.
- Perform any other functions as may be delegated and/or assigned

NB: SUCCESSFUL CANDIDATE WILL BE SUBJECTED TO THE VETTING PROCESS

Enquiries: Ms Helvi Ilonga Tel: 061-287 2143/
 Mr Paulus T Simon Tel: 061 287 2097

DEPARTMENT ADMINISTRATION AND INFORMATION TECHNOLOGY MANAGEMENT DIVISION: HUMAN RESOURCES SUBDIVISION HUMAN RESOURCES ADMINISTRATION AND WELLNESS

Post : Human Resource Practitioner Grade 8
2x post : Windhoek
Salary scale : N\$220,828 – 263, 911
Housing Allowance : N\$13,080 per annum
Transport Allowance : N\$7,680 per annum

Minimum requirements: A National Diploma in Human Resource Management or an equivalent qualification majoring in Human Resource Management on NQF level 6.

Key Performance Areas:

- Interpretation and application of the Public Service Act, Public Service Regulations and Staff Rules, Personnel Administrative Measures, Labour Act, Affirmative Action Act, Social Security Act, Delegated powers and other relevant Acts, Rules and Regulations.
- Processing and obtaining approval for advertisements, appointments, transfers, resignations, abscondments, demises, retirements, pension admissions/withdrawals, progress reports, confirmation/ extension of probation, salary increments/adjustments, overtime claims, service bonus, medical aid scheme membership, departmental debts, removal of furniture and retirements etc.
- Calculation of leave gratuity, house loans/subsidies/rent and housing allowance and other allowances, service bonus/prorate bonus.
- Ensure that all staff movements (appointments, transfers, promotions, demotions, discharges, etc) are properly recorded and relevant information transmitted to the Office of the Prime Minister.

Enquiries: Mr. Nelson Kashinduka Tel: 061 – 2872141/
 Ms Chrissie Kaakunga 061-287 2412

OFFICE OF THE EXECUTIVE DIRECTOR

Post : Public Relations Officer Grade 8
1x post : Windhoek
Salary scale : N\$220,828 – 263 911
Housing Allowance : N\$13,080 per annum
Transport Allowance : N\$7,680 per annum

Minimum requirements: A Bachelor Degree in Journalism, Media Studies or Mass Communication on NQF Level 7 or equivalent qualification. Applicants must demonstrate understanding and knowledge of prior Public Relations functions

Key Performance Area:-

- Coordinate information dissemination to internal and external Stakeholders.
- Assist to Compile News Letters/magazines, publications as well as

brochures and liaise with other Directorates/ Divisions for inputs.

- Liaise with other stakeholders and render assistance in the drafting of press releases.
- Coordinate and attend all official engagements or meetings of the OPM
- Responsible for the marketing of the activities including publications and feedback pertaining to queries from outside.

Enquiries: Ms Ellie N Ndungula Tel: 061-287 2148 /
 Ms Rosina Marenga Tel:061-287 2036

DEPARTMENT PUBLIC SERVICE MANAGEMENT DIRECTORATE: REMUNERATION, BENEFIT AND INDUSTRIAL RELATION

Post designation : Private Secretary Grade 9
1xPost : Windhoek
Salary Scale : N\$ 180, 505 – 216, 499
Housing Allowance : N\$ 10, 464 per annum
Transport Allowance : N\$ 7, 680 per annum

Minimum Requirement: A National Diploma in Office Administration on NQF Level 6 or equivalent qualification.

Key Performance Area:

- Managing office of the director on daily basis.
- Follow up on action items for director, schedule and coordinate appointment
- Draft letters, emails and capture important documents electronically
- Maintain incoming , outgoing calls, organize the Office
- File all correspondences in a hard/soft copies
- Ensure reservations for meetings and trips are made and update contact lists

Enquiries: Mr Simon Paulus 061-287 2097/
 Ms. Emma Shaambedimo Tel: 061-287 2147

DEPARTMENT OF PUBLIC SERVICE E-GOVERNMENT MANAGEMENT, DIVISION DATA CENTRE AND NETWORKS SUBDIVISION SECURITY & NETWORKING

2xPost : Systems Administrator, Grade 9
Duty Station : Windhoek
Scale of Salary : N\$ 243,812-N\$ 274,573 (P)
Transport Allowance : N\$ 13080.00 p.a.
Housing Allowance : N\$ 7680.00 p.a.

Minimum Requirements: A B-degree NQF L7 in System Administration, Network Engineering, Computer Science, Cyber Security or equivalent, plus (3) years appropriate experience.

Key Performance Areas:-

- Implementing the networking requirements of the GRN and participate in the acquisition of the services of Telecommunication service providers to install, extend and commission the Government Wide Networks with redundant and failover facility.
- Monitoring, maintaining, troubleshooting and upgrade the different components of the GRN network, including Local area Networks (LAN), Wide area networks (WAN), Virtual LANs, firewalls, IP addressing, DNS, load balancing, and related networking technologies.
- Supporting Domain and LAN/WAN services. Configure and maintain DHCP services. Plan, test, and maintain Access Policies.
- Troubleshooting network devices that include PCs, printers, tablets and other mobile devices, routers and switches; desktop operating systems and virtual machines.
- Collect data in order to evaluate and optimize network or system performance.
- Interpret and solve problems when a user or an automated monitoring system alerts them that one exists.
- Maintaining systems Security, identify and resolve known vulnerabilities across the GRN ICT Infrastructure and networks.
- Implementing, tracking, and controlling the security services staffing, and operations, and ensure that facilities, premises, and equipment adhere to all applicable laws and regulations.

Enquiries: Ms Winny Dama Tel: +264 61 2872477/
 Ms. Chrissie Kaakunga: Tel: +264 61 287 2412

In terms of Affirmative Action plan, qualifying women and persons with disabilities, are encouraged to apply. Failure to complete all items on the application form for employment and not attaching CV, ID and Qualifications will disqualify the application. Qualifications obtained from foreign education institutions must be evaluated by NQA.

All applications for the above mentioned posts must be made on Application for Employment form 156043 and a Health Questionnaire obtainable at all Government offices be completed in full and attached a comprehensive curriculum vitae and certified copies of education qualifications and identity document must be address to:-

The Executive Director Or
 Office of the Prime Minister
 Private Bag 13338
 Windhoek

Hand Delivered to: Division Human Resources
 5th Floor, Theo-Ben Gurirab Building
 Office of the Prime Minister
 Windhoek

Closing Date 23 September 2022.



PUBLIC NOTICE: ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EXPLORATION ACTIVITIES & INVITATION TO A PUBLIC MEETINGS

In accordance with the Environmental Management Act (No. 7 of 2007) and its regulation, notice is hereby given to all Interested and Affected Parties (I&APs) that an application will be made to the Environmental Commissioner for environmental clearance as follows:

1. Project: Exploration Activities For Base, Rare Metals, Industrial Minerals And Precious Metals on EPLs 8546 and 8548

2. Project Area: Between Otavi & Grootfontein Otjozondjupa Region

Farms affected by EPL 8548: Aachen, Ackerland, Auros, Awagobib, Awagobib, Awagobib 45/6, Awagobib 45/7, Awagobib 45/8, Awagobib 45/A, Awagobib 45/B, Blok, Crums, De Rust Ged.I, De Rust Ged.II, De Rust Ged.III, Dressefarm, Driehoek, Eichenbach, Einbaum, Farkfontein, Flachland, Frankfurt, Friedland, Gauss, Gemboklaagte, Gross Otavi, Gross Otavi, Gute Hoffnung, Gute Hoffnung 14, Hansenia, Harasib, Hasenjagd, Heinschhof, Hermanskamp, Hoba Ost, Irvington, Johannestal, Kalksgel, Kalkrand Rest, Millicent, Nageib, Neuhaus Ost, Neuhaus West, Neuschwangstein, Norma, Nossib Ged.I, Olifantsfontein, Olifantsfontein, Ossa, Otago, Plaas, Plaas, Poolmanskloof, Ramseck, Rietfontein, Rouville, Sasebo, Sommerau, Sumas, Sumas West, Texas, Toggenburg, Toggenburg West, Uitsab, Valerie, Venus

Farms affected by EPL 8546: Nosib Block III, Hurisib

3. Proponent: Metalex Mining and Exploration Pty Ltd

4. Date for Public Meetings: 3rd September 2022

5. Venue for Public Meeting 1: The Kanteen @ 10H00 – 13H00

Venue for Public Meeting 2: Omulunga Community Hall @ 14H00 – 16H30

6. Deadline for submission of comments: 26th September 2022

7. Register as I&APs @: reddunes18@gmail.com or Call +264 81 147 7889

Please Note: The two public meeting are meant to accommodate all farmers and interested stakeholder. Farmers affected in the area of Otavi and Kombat are encouraged to attend the meeting in Kombat, while farmers close to Grootfontein are encouraged to attend the meeting at Grootfontein.

CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF A POWERLINE, PIPELINE AND ROAD IN SUPPORT OF TANTALITE MINING ON ML 223

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderzit.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderzit.

Proponent: Orange River Pegmatite (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **12/09/2022**. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba
 Email: eia@impalac.com
 Tel: 0856630598



CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED COPPER MINING ON ML 248 & 249

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omarandou settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd
Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:
 Mr. S Andjamba
 Email: eia@impalac.com



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 best boost you can!

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 motoring supplement
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Du Preez takes up new position at Old Mutual

India GDP surges on pandemic rebound despite headwinds

MUMBAI - A post-pandemic rebound saw India's economy grow 13.5% in the June quarter, official figures showed yesterday, but inflation and other headwinds signal a looming slowdown in Asia's third-largest economy. The double-digit expansion from last year reflects a dramatic uptick in activity since mid-2021, when the peak of the country's most devastating coronavirus wave began to recede.

That outbreak saw thousands of people dying across India each day, overwhelming hospitals and crematoriums, and came after an extended lockdown that pummelled consumer spending and brought factories to a standstill. Yesterday's figure from the national statistics office was the highest since the 20.1% expansion recorded during the same period last year, at a time when business activity was recovering from government shutdown edicts.

State Bank of India chief economic advisor Soumya Kanti Ghosh said in a note that India was navigating well through global uncertainty "with leading indicators continuing to show acceleration". A rebound in capital inflows in August after months of investor flight from Indian debt and equities also pointed to improved sentiment, Ghosh said.

But yesterday's result is lower than the 16.2% forecast by India's central bank, and other economists expect headwinds to

buffet the economy and dampen growth into the next year. Elevated crude oil prices and a seven percent fall in the rupee this year have hit living costs and left India struggling with a deteriorating trade balance.

India's merchandise trade deficit widened to a record US\$31 billion in July, compared to US\$10.6 billion in the same month last year, provisional data showed. Import costs, led by petroleum products and coal, were more than twice as high as export revenues.

India imports more than 80% of its crude oil needs and shocks to the market since Russia-Ukraine conflict have left its 1.4 billion people struggling with higher fuel charges.

Consumer inflation has consistently overshoot the central bank's 2-6% target range this year, hitting an eight-year high of 7.79% in April before cooling to 6.71% in July.

In August, India's central bank hiked interest rates for the third time in four months, pushing borrowing costs up to pre-pandemic levels. The Reserve Bank of India forecasts 7.2% growth for the current financial year owing to "geopolitical tensions" and the risk of "global recession". The International Monetary Fund last month slashed its own outlook for the same period to 7.4%, a figure that still exceeds every other major economy besides Saudi Arabia.

- Nampa/AFP

■ Staff Reporter

Old Mutual yesterday confirmed the appointment of Mignon du Preez as their Marketing, Public Affairs and Sustainability Executive as of 1 September 2022. In her new role, Du Preez will lead and manage all marketing activities, public relations, and sustainability initiatives as a member of the Old Mutual Namibia executive team.

Du Preez boasts over 15 years of experience in strategic leadership, marketing, business development and business transformation.

Academically, Du Preez holds an MBA from the Cardiff Metropolitan University, a Master's in Strategy and Innovation from the Westford University Executive Programme, an International Marketing Higher Certificate and International Management



Appointed... Mignon du Preez has joined the executive team at Old Mutual. Photo: Contributed

Certificate from the Institute of International Marketing and Management [IMM] and a Change Management

Certification from the University of Cape Town.

Before joining Old Mutual, she completed a stint at the Bank of Namibia as Manager for Strategy, Projects, and Transformation. Prior to joining the bank, she was the senior manager for Clients and Industries at Deloitte Namibia.

"In Du Preez, we have a clear and confident communicator who is people oriented with a high-level of interpersonal awareness. She holds a wealth of knowledge regarding strategic development, planning and implementation, marketing, advertising, and communications as well as brand & image management. We are excited to welcome her to the team and believe she will help continue to drive our brand forward," said Tassius Chigariro, Group Chief Executive Officer, Old Mutual Namibia.

US senator Bernie Sanders backs UK strikers

LONDON - The independent US senator Bernie Sanders yesterday gave his backing to striking British railway workers, adding an international dimension to the growing push for higher wages in the UK.

The influential progressive lawmaker was slated to join members of the RMT union at a rally for transport workers in London yesterday night.

The rally, outside the headquarters of the Trades Union Congress (TUC), coincides with strike action by postal workers, telecoms staff as well as journalists.

"People are tired of being ignored while the rich get richer," Sanders (80), told The Guardian in an interview.

The UK is in the grip of a cost of living crisis, with inflation at a 40-year high of 10.1% and spiralling energy prices.

Investment bank Goldman Sachs has predicted rates could even top 20% from early next year if wholesale gas prices stay high.

Industrial action has been

increasing for months, spreading from the railways and aviation sector to postal services, telecoms and even criminal lawyers.

Health service workers, including nurses and junior doctors, are currently being balloted for strike action.

Yesterday, the TSSA union representing transport and travel sector workers, announced a 24-hour strike by train drivers on September 26-27.

The walk-out over pay, job security and conditions is timed to coincide with the final days of the Labour party's annual conference in Liverpool.

"As a Labour affiliated union, TSSA will be looking for support from conference delegates and MPs to join them on the picket line to show solidarity in fighting the Conservatives' cost of living crisis," the union said in a statement.

Unions, major donors to the country's main opposition party, have criticised its leader Keir Starmer for his lukewarm support for striking workers.

The scale of the current

industrial unrest has not been seen since the 1980s, when Conservative prime minister Margaret Thatcher sought to weaken the unions as part of free market economic policy.

It has been widely dubbed "the summer of discontent", in a conscious nod to the "winter of discontent" of 1978-79, the wave of public sector strikes before Thatcher came to power.

Prime Minister Boris Johnson, who leaves office next week, has done little to tackle the crisis since he announced his resignation in July.

Last week, households were told they face an 80% increase in energy bills, stoking fears that millions will be unable to pay.

Johnson's successor will be announced on Monday, with the Thatcherite Foreign Secretary Liz Truss favourite against former finance minister Rishi Sunak.

Truss has rejected handouts to help those most in need, while Sunak is in favour of direct government support.

- Nampa/AFP



VACANCY



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LOCATION: Walvis Bay

MINIMUM REQUIREMENTS:

- Registration with the Health Professions Council of Namibia as a Radiologist
- Experience in Interventional Radiology
- Namibian Citizen or eligible to work in Namibia
- Traceable references are essential
- Proof of existing medical malpractice insurance cover

Interested applicants meeting the above requirements are invited to apply for the vacancy by submitting their application to the following email address:

talent@welwitschiahospital.com

Interested applicants must indicate the position they apply for in order to be considered for the specific vacancy. Only shortlisted candidates will be contacted and must be willing to submit themselves to an interview, psychometric testing and selection procedures.

As per Affirmative Action (Employment) Act, Act 29 of 1998; Namibian Citizens from previously disadvantaged groups are encouraged to apply.

CLOSING DATE: 11 SEPTEMBER 2022

Trusted Care

CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED COPPER MINING ON ML 248 & 249

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omararandu settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:
Mr. S Andjamba
Email: eia@impalac.com



CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED CONSTRUCTION OF A POWERLINE, PIPELINE AND ROAD IN SUPPORT OF TANTALITE MINING ON ML 223

This notice serves to inform all interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and the Environmental Regulations (GN 30 of 2012). The project will comprise of a powerline, water pipeline and gravel road construction along D206 road from Warmbad to farm Kinderzit.

Location: The infrastructure will be about 46 km long, from Warmbad to Farm Kinderzit.

Proponent: Orange River Pegmatite (Pty) Ltd
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **12/09/2022**. Details of public meeting will be communicated to registered parties. Contact details for registration and further information:

Mr. S Andjamba
Email: eia@impalac.com
Tel: 0856630598



To Whom it may concern

**Consent Letter for Exploration and Mining on Mineral licences:
ML 248, ML 249 and EPL 8126**

We hereby wish to inform you that our Traditional Authority hereby gives consent for mining and exploration on ML 248, ML 249 and EPL 8126, which occurs within the vicinity of the Opuwo Area.

Consent is hereby given to allow the prospecting and mining activities to take place subject to the approval by the relevant authorities.

We however do wish to emphasize that the project owner should consider the traditional authority in any corporate social responsibility programs and that all local norms and regulations should be strictly adhered to. Wherever possible, our local community members should be given preference for any employment opportunities.

Thank you for your cooperation. Should you require any further information, please do not hesitate to contact me.

Yours Sincerely

.....
Name

Tjikuro Tjikundi

Signature

.....
Date

16/09/2022

Contact Number

0817576493

Okapembambu

Position



CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR PROPOSED COPPER MINING ON ML 248 & 249

This notice serves to inform interested and affected parties that an application for the environmental clearance certificate will be launched with the Environmental Commissioner in terms of the Environmental Management Act (No.7 of 2007) and Environmental Regulations (2012) for the proposed activity:

Project: Proposed copper mining on Mining Licenses 248 and 249.

Location: The projects are 55 km northeast of Opuwo, close to the Omarandu settlement area, within the Kunene Region.

Proponent: Shiloam Mining and Investments (Pty) Ltd

Project Description: The project will comprise of copper mining activities.

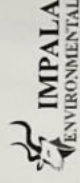
All interested & affected parties are invited to register and submit comments on or before **16/09/2022**.

Contact details:

Mr. S Andjamba

Email: eia@impalac.com

Tel. + 264856630508



Mr. Ndaluka Amutenya

1. **Proposed Position:** Environmental Coordinator
2. **Name of Firm:** Impala Environmental Consulting
3. **Name of Staff:** Ndaluka Amutenya
4. **Nationality:** Namibian
5. **Education:** - Bachelor of Technology, Chemical Engineering,
University of South Africa, 2020
- Bachelor of Science, Chemistry Major and Geology Minor,
University of Namibia, 2012
- Namibia Senior Secondary Certificate (NSSC),
Otjikoto Senior Secondary School, 2008
6. **Membership of Professional Associations:**
- None
7. **Other Training:** - None.
8. **Countries of Work Experience:** Namibia
9. **Languages:**

	<i>Speaking</i>	<i>Reading</i>	<i>Writing</i>
English	Excellent	Excellent	Excellent
Afrikaans	Excellent	Good	Good
Oshiwambo	Excellent	Excellent	Excellent
- 10 **Employment Record:**

From: 2019 to Present	
Employer:	Impala Environmental Consulting
Positions held:	Environmental Assessment Practitioner
From: 2015 to 2018	
Employer:	Tschudi Copper Mine
Positions held:	Chemist
From: 2013 to 2015	
Employer:	Heat Exchange Products (Water Treatment)
Positions held:	Water Treatment Specialist

11. Detailed Tasks Assigned	12. Past Projects Undertaken
<ul style="list-style-type: none"> • Project Local Consultant • Client Liaison 	<p>Name of assignment or project: Catchment Management Plan for the swakoppoort dam namibia</p> <p>Year: 2020</p> <p>Location: Okahandja, Namibia.</p> <p>Client: Namwater</p>

<ul style="list-style-type: none"> • Water Sampling and Reporting • Project Management • Project Supervision 	<p>Main project features: Catchment Management Plan for the Swakoppoort Dam.</p> <p>Positions held: Local Consultant</p> <p>Activities performed: Water Sampling, logistics, site inspections and report writing.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for the Development of a Tantalite Mine, Southern Namibia.</p> <p>Year: 2020</p> <p>Location: Warmbad, Karas Region</p> <p>Client: Orange River Pegmatite (Pty) Ltd</p> <p>Main project features: Environmental Management</p> <p>Positions held: Lead Consultant</p> <p>Activities performed: Project Management, Report Writing, Public Participation, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Proposed Development of A Medical Tourism University Hospital In Henties Bay</p> <p>Year: 2020</p> <p>Location: Henties Bay, Erongo Region</p> <p>Client: Franco Civil Engineering Cc</p> <p>Main project features: Environmental Impact Assessment.</p> <p>Positions held: Lead Consultant</p> <p>Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for the Development of a Marble Mine.</p> <p>Year: 2020</p> <p>Location: 10 km north of Karibib</p> <p>Client: Sunsand Investments (Pty) Ltd</p> <p>Main project features: Environmental Impact Assessment.</p> <p>Positions held: Lead Consultant</p> <p>Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Dimension Stone Quarrying Activities on Mining Claims 71816, 71817, 71818, 71819, 71820, 71821, 71822, 71823, 71824, And 71825.</p> <p>Year: 2020</p> <p>Location: 40 km northwest of Arandis</p> <p>Client: Rockstar Mining cc</p> <p>Main project features: Environmental Impact Assessment.</p> <p>Positions held: Lead Consultant</p> <p>Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>

<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Sand Mining Activities on Mining Claim 72027 Year: 2020 Location: 30 km North of Ongwediva Client: Comitx Investments Group CC Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Mineral Exploration Activities on EPL 6408 Year: 2020 Location: 5 km south of Karibib Client: Antler Gold Inc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Dimension Stone Quarrying Activities on Mining Claims 71896-71900 Year: 2020 Location: 15 km north of Karibib Client: Triple Tas Trading cc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Mineral Exploration on EPL 7930 Year: 2020 Location: 40 km northwest of Karibib Client: Antler Gold Inc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation 	<p>Name of assignment or project: Environmental Impact Assessment for Dimension Stone Quarrying Activities on</p>

<ul style="list-style-type: none"> • Report Writing • Project Management • Project Supervision 	<p>Mining Claims 72100, 72101, 72102, 72103, 72104, 72105 And 72106 Year: 2020 Location: 40 km northeast of Arandis Client: Tala Mining cc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Mineral Exploration on EPL 5702 Year: 2020 Location: 30 km South of Kamanjab Client: Emor Mining (Pty) Ltd Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for the Development of a Lodge in the Daures Conservancy Area. Year: 2019 Location: 50-80 km northwest of UIS Client: !U-#Gab Ams Investment cc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Eia For the Proposed Establishment of a Service Station on Erf 4121, Khorixas Year: 2019 Location: Khorixas Client: Noabeb's Trading Enterprises cc Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment on dimension stone and industrial mineral quarrying activities on mining claims 71227 and 71228. Year: 2019 Location: 10 km south of Omaruru Client: Hiku Poultry and Trading CC Main project features: Environmental Impact Assessment.</p>

	<p>Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Mineral Exploration Activities on Epl 5818, Central Namibia Year: 2019 Location: 40 km east of Khorixas Client: Gravity Empire Investments (Pty) Ltd Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>
<ul style="list-style-type: none"> • Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision 	<p>Name of assignment or project: Environmental Impact Assessment for Mineral Exploration on Epl 6374 Year: 2019 Location: 50 km South of Opuwo Client: Nami Geological Techniques (Pty) Main project features: Environmental Impact Assessment. Positions held: Lead Consultant Activities performed: Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.</p>

Specialist Hydrogeological Assessment for proposed Mining Activities on ML 249

ML 249

Mr. J. Shilunga (*MSc. Geology*)
Dr. J Hamukoto (*Phd, Hydrogeology*)

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1. Introduction

The authors were requested by Impala Environmental Consulting to conduct a hydrogeological evaluation of the proposed mining activities on ML 249 within the Kunene Region of Namibia. This study is based on historical data, literature, a site visit and expert knowledge.

2. Scope of Work

The scope of the study was to assess the hydrogeology of the area. Suitable targets have been delineated. The actual mining targets that will be developed on the land are contained within ML 249.

3. Project Description

3.1 Location

The project is in the Kunene region, about 57 km northeast of Opuwo, along the C35 road.

3.2 Topography and Drainage

The terrain around the ML 249 is rocky and rugged in nature with steep slopes characterising the mountainous sections whilst the foothills of the mountains are flat and gently undulating. The project area is located within the central plateau landscape of Namibia. The central plateau is bordered by the skeleton coast to the northwest, the Namib Desert, and its coastal plains to the southwest, the Orange River to the South, and the Kalahari Desert to the east.

3.3 Geology

The area under licence is overlain by sediments of Damaran age partly covered by thick aeolian sand and calcrete. Outcrop is generally restricted to isolated and groups of inselbergs. The Damaran sediments can be subdivided into two main stratigraphic divisions, the Nosib and Otavi Groups. The latter comprises the Ombombo, Abenab and Tsumeb Sub-groups. The Nosib Group within the boundaries of the EPL comprises quartzites, arkoses, conglomerates and phyllitic sediments (siltstones and shales). Evaporitic rocks have not been unequivocally identified to date. Dolomitic Carbonates intercalated with dolomitic arkose dominate the Ombombo Sub-group. The Abenab Sub-group consists mainly of dolomitic carbonates with minor lithic

lithologies like conglomerates, quartzite, siltstone, and arkoses. The Tsumeb Sub-group consists of carbonates with various colour indices, shale, and cherts. At the base of the Abenab Sub-Group a conspicuous diamictite (Chuosi Formation) is developed with a package of siliciclastic. This formation is commonly characterised by a pronounced magnetic signature.

3.4 Hydrogeology

The only perennial river draining the general area is the Kunene River while smaller ephemeral drainage lines (southeast to northwest) include the Hoarusib, Ondoto, Otjitango, Ombuka, Omuhonga and Oheuva Rivers (Mendelsohn et al. 2002). According to the Hydrogeological Map of Namibia, from Opuwo halfway to Epembe (north) lies within fractured, fissured or karstified aquifers with moderate to high groundwater potential. Further north towards Okangwati the groundwater potential is very limited and characterised by dominant rock bodies of granite, gneiss, and old volcanic origin.

There are 3 known boreholes in the area. These were drilled during the periods of 1900-1993. The depth ranges from 50 m to 160 m. The elevation ranges from 1186 to 1200. The highest yield known from these boreholes is 10 m³/h. The lowest known yield from these boreholes is 0 m³/h.

Table 1 Groundwater Statistics: There are 3 known boreholes which were drilled in the area.

BH_MAIN_1	PK_ID	BHTOPO	BHWELL	BHNO_NEW	BHNO	LONGITUDE	LATITUDE	DRILLSTART	BHNOTE	DEPTH	ELEVATION	DIAMETER	YIELD	DEEPEST_WA	MOST_ACTUA	DATE_OF_LE
6679	8360	1714C	15	33938	WW33938	14.3644	-17.826	1993-06-03	OTJIMANANGOMBE	160	1200	254	0	0	0	
27018	47424		0	72643		14.3601	-17.82	1900-01-01		0	1190	0	0	0	0	
47770	1587	1714C	2	22582	WW22582	14.3576	-17.816	1977-11-25	OMAHENENE	50	1186	0	10	18	11.8	1977-11-25

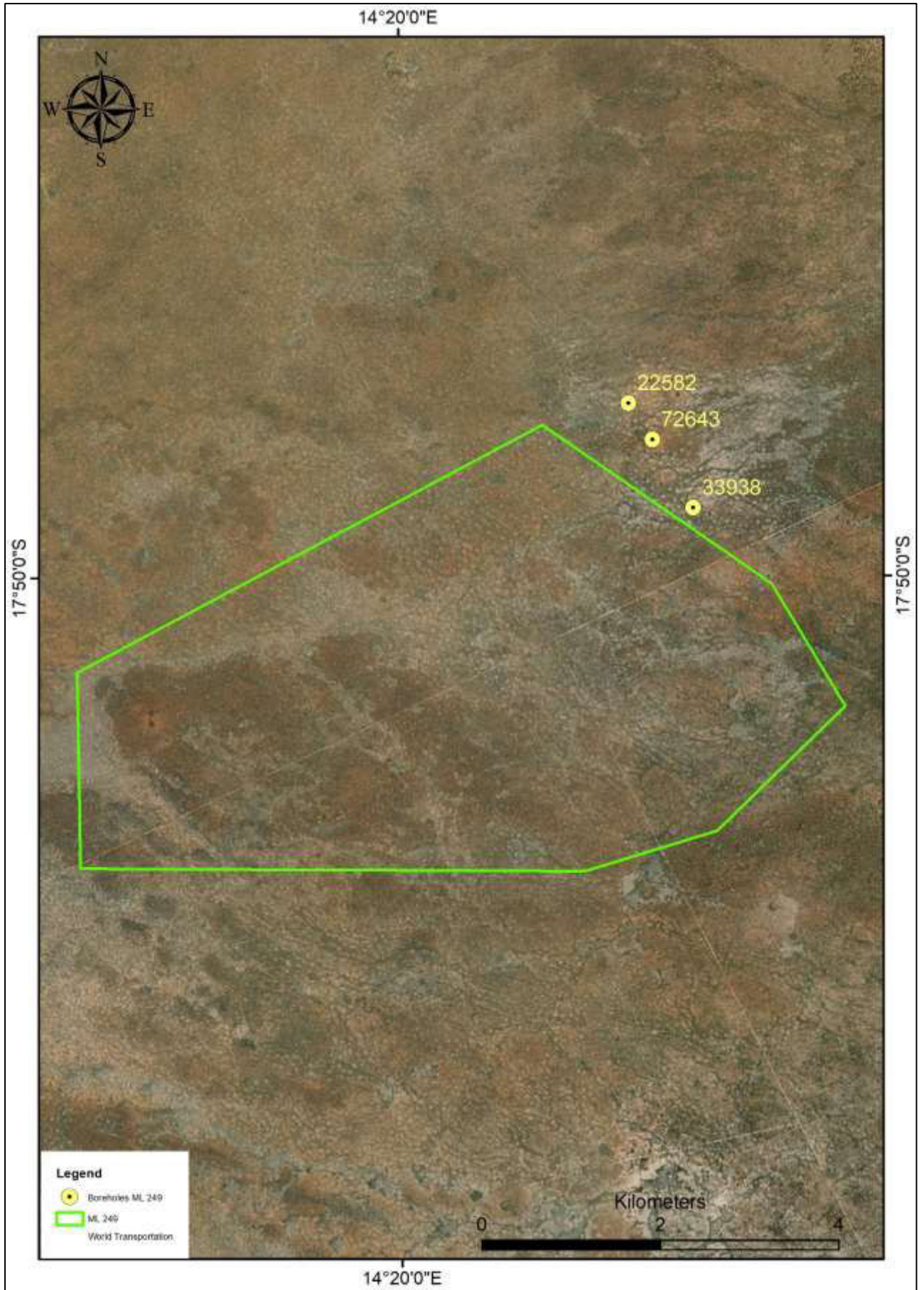


Figure 1 Locality of the known boreholes in the area.

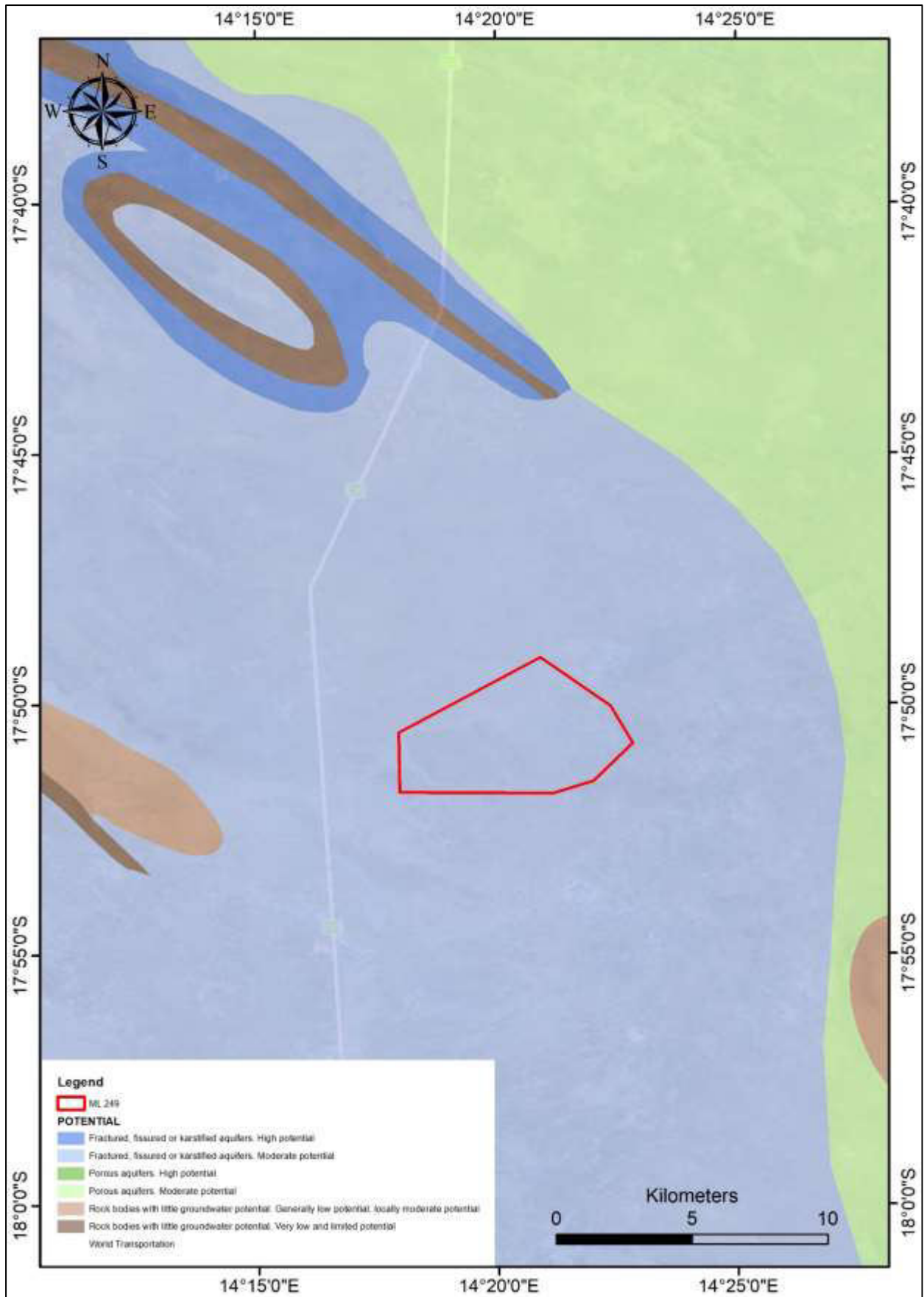


Figure 2 Groundwater potential map of the area.

4. Legal Framework

4.1 Environmental Management Act of 2007

The regulations that accompany this act lists several activities that may not be undertaken without an environmental clearance certificate issued in terms of the Act. The act further states that any clearance certificate issued before the commencement of the act (6 February 2012) remains in force for one year. If a person wishes to continue with activities covered by the act, he or she must apply for a new certificate in terms of the Environmental Management Act.

4.2 Water Resources Management Act of 2004

The act provides for the management, protection, development, usage and conservation of water resources; to provide for the regulation and monitoring of water resources and to provide for incidental matters.

4.3 Soil Conservation Act 76 Of 1969

The act provides for the combating and prevention of soil erosion, the conservation, improvement, and manner of use of the soil and vegetation and the protection of the water sources in the Republic and the territory of South-West Africa; and to provide for matters incidental thereto.

4.4 Namibian Water Corporation (Act 12 of 1997)

The act caters for water rehabilitation of prospecting and mining areas, environmental impact assessments and for minimising or preventing pollution.

4.5 The Minerals Prospecting and Mining Act of 1992

The Minerals Prospecting and Mining Act No.33 of 1992 approves and regulates mineral rights in relation to exploration, reconnaissance, prospecting, small scale mining, mining, large-scale mining, and transfers of mineral licences.

5. Site Specific Information

Impala Consulting has been appointed to conduct an EIA for the proposed mining activities on ML 249. The company intends to mine copper by open pit methods. Open

pit mining is the most widely used technique of mining copper today. It is accomplished by creating and using benches or terraces to gradually reach deeper under the earth's surface. Open pit mining is defined as the method of extracting any near surface ore deposit using one or more horizontal benches to extract the ore while dumping overburden and tailings (waste) at a specified disposal site outside the final pit boundary.

6. Assessments of Impacts

The purpose of this section is to assess and identify the most pertinent environmental impacts and provides possible mitigation measures that are expected from the commencement, operational and decommissioning activities of the exploration project.

6.1 Groundwater and Soil Contamination

Infiltration of as much uncontaminated precipitated water is greatly desired so as to recharge groundwater resources. The operational phase of the mining project will not alter the degree to which groundwater is replenished. At the very least then it is necessary that the quality of that groundwater is conserved. Care must be taken to avoid contamination of soil and groundwater when mining and drilling. Groundwater might spread pollutants to neighbouring receptors. Soil contamination can occur from chemical and fuel storage tanks, at dispensing points, by oils/greases during maintenance of equipment and machinery. This in turn contaminates the groundwater during infiltration of precipitation through porous rock units. Contamination of groundwater could also occur through infiltration of polluted water from broken or leaking sewerage pipes.

Nature of impact	Groundwater and Soil Contamination
Status of impact	Negative - environment overall will be adversely affected by the impact
Extent	Local (limited to a radius of 15 km of the operational area)
Duration	Long (years, <10 years)
Intensity	Medium (where the environment continues to function but in a noticeably modified manner)
Probability	Probable (moderately possible)
Degree of Confidence	High (based on the availability of specialist knowledge and other information)

Significance (without mitigation)	Medium (Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term.)
Mitigation	Ensure that all chemicals are properly stored in a specific location. All chemicals stored in this area must be properly labelled. The area where chemicals will be stored and handled must be constructed with an impermeable surface. Regular maintenance and monitoring of machinery and leakages to detect and prevent water contamination. Waste generated during drilling should not be disposed/stored near any surface water source in the area. Use spill control measures where spillages are likely to take place, e.g., where fuel / chemical pipelines are disconnected.
Significance (with mitigation)	Low

6.2 Runoff Water Contamination

Surface water from runoff during precipitation periods will flow into the tributaries, from where it will flow further east. Increased mechanical coverage will significantly increase runoff rates from the area into the surrounding areas. Excessive runoff can be mitigated through ensuring that trenches and holes are filled and flatter low lying areas are not impinged upon to maximise infiltration of precipitation, thereby recharging the groundwater. Eutrophication of the surface water stored in downstream dams could be exacerbated by liquid and solid waste which is not disposed of properly. Runoff of pollutants should be prevented from reaching the Kunene River, as this river provides recharge to groundwater sources further downstream and would pose a risk to groundwater related receptors. Nearby geological structures may provide preferential pathways to sensitive groundwater sources, and this should be protected at all cost. Groundwater is utilized in the area.

Nature of impact	Surface Water Contamination
Status of impact	Negative - environment overall will be adversely affected by the impact
Extent	Local (limited to a radius of 15 km of the operational area)
Duration	Long (years, <10 years)
Intensity	Medium (where the environment continues to function but in a noticeably modified manner)
Probability	Probable (moderately possible)
Degree of Confidence	High (based on the availability of specialist knowledge and other information)

Significance (without mitigation)	Medium (Where the impact could have an influence on the environment, which will require modification of the development design and/or alternative mitigation. This would be allocated to impacts of moderate severity/magnitude, locally to regionally, and in the short term.)
Mitigation	Any waste that could potentially pollute the water sources should be collected and disposed of in licensed landfills. Runoff from areas where surface water might become contaminated should be captured and treated to sewerage effluent standards. Uncontaminated runoff water should be diverted around areas where such water might become contaminated.
Significance (with mitigation)	Low (Where the impact will have a negligible influence on the environment and no modifications or mitigations are necessary for the given development description)

7. Conclusions

The water demand for the mining project is low to moderate. The risk of soil and groundwater pollution is low to medium but mitigating action can reduce the risk to manageable proportions. It is advised that the mining contractors are made aware of the EIA documentation and that they draft site specific assessments, relevant to their development scenarios.

Section 23 of the Water Act (Act, No. 54 of 1956) makes it a criminal offence to: *'pollute fresh water or the sea in a way that makes the water less fit for any purpose for which it is or could ordinarily be used by people, including use for the propagation of fish or other aquatic life, or use for recreational or other legitimate purposes'*.

8. References

- Bäumle, R., Bittner, A., & Bockmühl, F. (2011). *Groundwater in Namibia, an explanation to the Hydrogeological Map*. Windhoek: Department of Water Affairs, Ministry of Agriculture, Water and Rural Development.
- Miller, R. (1992). *The mineral resources of Namibia*. Windhoek: Geological Survey of Namibia, Ministry of Mines & Energy. p2.3-93-96.
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Socio-economic Baseline and Impact Assessment EIA of the proposed Copper Mine on ML 249



14 October 2022

Compiled by: Dr. K Halenyane
(Phd, Environmental Science, Uct)

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1 Introduction

Shiloam Mining and Investments (Pty) Ltd is in the process of advancing its copper Mine Project in north-Western Namibia, through its feasibility stages towards the development of a copper mine. The mining licence is located 40 km northeast of Opuwo, along the C35 road.

Figure 1.1. Project Locality



Halenyane was appointed by Impala Environmental Consulting cc to conduct a socio-economic baseline and impact study for the Environmental Impact Assessment (EIA). Halenyane has focused on socio-economic issues.

1.1 Terms of reference and rationale

The EIA and the resulting Environmental Management Plan (EMP) should comply with Namibian legislation and International Standards. The socio-economic study aims to provide relevant background and baseline information of the wider project area. The assessment chapter aims to identify, describe and assess the significance of all main potential socio-economic impacts of the proposed mine and associated infrastructure using standard EIA methodology supplied by Impala. Management measures for the enhancement of positive socio-economic impacts and the mitigation of negative impacts have been recommended.

Shiloam needs to demonstrate to the Namibian Government, affected parties and international financing institutions that there are adequate social safeguards, relevant social management and development

plans and the risk of social disruption is under control. The overall aim is to ensure that the project is developed in a manner that is socially responsible and reflects sound environmental management practices.

The specific objectives of the socio-economic study are to:

- Provide baseline information that describes the living conditions of communities likely to be affected by the mine;
- Identify how and to what extent local communities and the wider population will be both directly and indirectly impacted by the mine
- To understand the socio-economic impact variables that are likely to change during the lifespan of the mine.

1.2 Methodology

In 2020, previous owners of the Project, commenced the pre-feasibility study and scoping phase of the environmental impact assessment (EIA).

In 2021, the Shiloam management initiated a socio-economic needs assessment, outside the scope of the EIA, for the purpose of developing a Corporate Social Investment (CSI) strategy.

The EIA study has built on the CSI's socio-economic needs assessment and was conducted using the following methods:

- a desk top study
- case studies from other mines in Namibia
- key informant/ stakeholder interviews and
- issues and concerns raised during the consultation process.

1.3 Study Limitations

The 2011 census has released some provisional population data however other source material available is still based on the 2001 census.

No direct discussions have been held with the project's neighbours as this is planned to take place during public consultations on the whole draft EIA.

2 Project Description

The proponent, Shiloam Mining and Investments (Pty) Ltd, applied for a mining licence, with the Ministry of Mines and Energy. The proponent intends to mine copper ore from the mining licence.

The envisaged plant will consist of a crushing and milling unit, gravity separation processes and final magnetic upgrading to produce a marketable copper concentrate.

Impala Environmental Consulting cc was appointed by the proponent to undertake an Environmental Assessment (EA) and Environmental Management Plan (EMP) for the tenement. The map above shows the licence boundary.

3 Population Characteristics

Kunene Region is geographically located in the Northwestern part of Namibia and encompasses a range of biomass or landscapes neatly arranged parallel to one another. On the west is the for-bidding Skeleton Coast. A region of rocks, fog, shipwrecks and desolation, washed by the waters of the Benguela current, which brings Antarctic cold to desert heat. The region's administrative capital is Opuwo.

The Kunene River in the northern part of the region forms an international boundary with Angola. The Kunene region borders Omusati region to the east and south east of the Etosha National Park. In the south it borders Erongo and Otjozondjupa region.

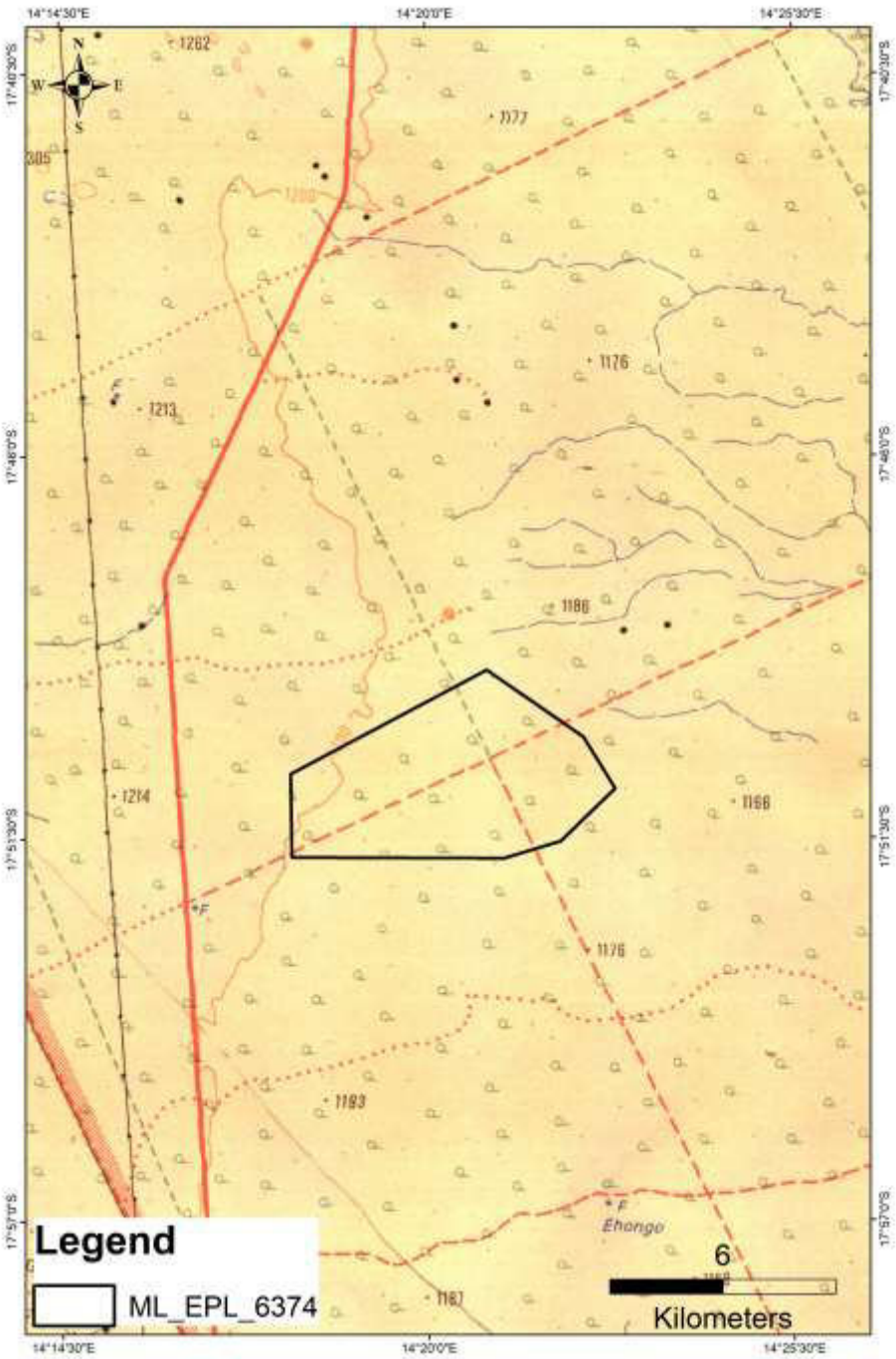
The Kunene region covers an area of 115,293km² of the total Namibian land. Kunene region is the second largest region after //Karas region. Kunene region is home to 86, 856 inhabitants (Census 2011) representing 4% of the Namibian population.

4. The Affected Community

4.1 Neighbouring landowners and farm-workers

The mine is surrounded by communal land which is used primarily for farming livestock with some game hunting and tourism use in varying combinations. Figure 4.1 shows the location of the mine site in relation to the neighbouring community which may be affected.

Figure 4.1. Location of EPL and communal area.



4.2 Opuwo

Opuwo is the capital town of the Kunene Province of Namibia. It is located in the North Western parts of the country and has a total population of approximately 15 000 residents. The name Opuwo means “it is enough for me” and this name was derived from what commissioner Mr. Hugo Hahn said when more land was offered to him. Pieter de Villiers of the Congress of Democrats is Opuwo’s current mayor.

The first office to be established in the area was the colonial administrator in Kaoko in 1997, which was located at the Swartbooi’s Drift on the banks of the Kunene River before the location's name was changed to Opuwo.

Opuwo is situated at the intersection of the C41 and C43. There is a small airfield in town, Opuwo Airport. Putuavanga Senior Secondary School in town is among the best government schools in Kunene Region. There is also the Opuwo Primary School with 39 teachers and 1,200 learners.

There are the following organizations and offices in the town: Opuwo Police Station, Opuwo District Hospital, Ministry of Home Affairs (Department of Civic Affairs / Regional Civic Registration Office / Kunene Region) and Opuwo Department of Works. Opuwo suffers from a lack of economic development and employment opportunities, which leads to frustration and outward migration among many of the town's youth.

The economy of the region is mainly based on tourism and is slowly becoming more diversified due to expansion in the service station industry. The largest industry in the region is the tourism industry, followed by the farming and retail industry. The third biggest income generating activity of the Kunene Region is tourism.

4.3 Kunene Regional Council

The Kunene Regional Council was established through act 22 of 1992 as amended in accordance with article 103 of the Namibian Constitution. The mandate of the council is derived from the regional council's act, 22 of 1992, section 28 (1) (i-vi) i.e. to govern and plan for the development of the people, this includes:

- Socio–Economic development
- Sustainable utilisation of natural resources
- Enhancement of economic stability through local empowerment
- Facilitate infrastructure development

The other mandates derived from the decentralisation enabling act

Kunene region prides itself on being the most ethnically and demographically diversified region and as home to Namibia's indigenous ethnic population called the Ovahimba, whose lifestyle, tradition, values and culture have never transitioned to modernity even after centuries of colonialism.

The Kunene region forms part of Namibia's fourteen (14) regions whose Regional Councils are a creature of the statute "Regional Council Act of 1992" (Act No.22 of 1992, as amended). Article 103 of the Namibian Constitution makes provision for the establishment of Regional Councils as the highest governing authority in their respective regions.

The role of the Regional Council is to plan and development the region in order to improve the standard of living of its inhabitants. Kunene is re relatively under-developed, but with the potential for agriculture, tourism, mining and logistical development.

Kunene region prides itself on being the most ethnically and demographically diversified region and as home to Namibia's indigenous ethnic population called the Ovahimba, whose lifestyle, tradition, values and culture have never transitioned to modernity even after centuries of colonialism.

The development profile was compiled as part of the National Government's strategy to develop and communicate systematic guidelines to decision and policy makers, serve as a source of information to the donor community, civil society and potential investors and assist and inform the budget allocation for implementation of regional development programmes and projects.

The Kunene Regional Council's Strategic Plan 2009 - 2014 aims to ensure that Kunene makes a significant contribution toward the achievement of Vision 2030 over the five-year period. Of the Regional Council's mandate, two are relevant here:

- a) To govern, plan, coordinate and implement socioeconomic development activities; and
- b) To ensure environmental protection and sustainable natural resource utilization.

AGRICULTURE – Key challenges identified include poor livestock quality on communal and resettlement settlements, livestock marketing challenges for communal headmen, overstocking and resultant overgrazing of farm land, limited crop production, inadequate water infrastructure for agricultural development, unmet resettlement needs, bad road conditions and bad infrastructure, and inadequate financing agriculture development. Main LED initiatives identified are support to communal headmen, outreach of existing skills development programmes, database development on skills development programmes for headmen, development of regional marketing calendar for livestock, regional Livestock Marketing Workshop, marketing infrastructure upgrade and maintenance in constituencies, Rangeland Management Training for communal headmen, virgin land development for agricultural production, water infrastructure development in prioritized targeted communal land, prioritize resettlement needs of people with livestock on town lands, horticultural production on resettlement settlements, debushing of agricultural land (including exploring potential for energy production), urban agricultural (horticultural) initiative on settlement and town lands

(including incentives), and up scaling of Ministry of Agriculture Water and Forestry (MAWF) pilots in the region.

TOURISM – Key challenges identified include under-developed craft and cultural tourism, inadequate marketing & promotion for the tourism sector, inadequate or under-developed tourist attraction, inadequate contribution of the communal conservancies to tourism growth, and guest and tourist accommodation inadequacies in certain urban localities. Main LED initiatives identified are safety & security coordinating mechanism in region, marketing agency establishment, establish regional tourism forum and revive local tourism forums, training of tourism operators, hospitality infrastructure in targeted urban localities (e.g. tourism info centre cum coffee shops, restaurants, Internet café's, and craft market development), training institutions development in the region, product development for tourism (inclusive of tourism route development, day tours, etc), support to communal conservancies (institutional and resource support mobilized), guest accommodation in targeted locations.

MANUFACTURING – Key challenges identified include challenges for the charcoal industry, procurement challenges for the manufacturing industry, competition from South African and other suppliers, skills availability challenges for the manufacturing industry, high costs of inputs, uncertainties and unpredictability of the Angolan market, and work permits for skilled workers. Main LED initiatives identified are about exploring value addition in charcoal production, regulation and control of charcoal industry, encourage the introduction of entrepreneurship in school syllabus, vocational and technical skills, procurement of local products & services by public services, database development of manufacturers and other business in region, incentives package development for industry in the region, and marketing initiatives for manufactured products in the region.

SERVICES – Key challenges identified include challenges of local authority services, inadequate stakeholder relationships and communication, inadequate settlements development, limited

serviced and prime land availability in urban areas, skills development gaps, housing and accommodation demand not met, and poor levels of public services provision (related to essential services such as education, health, security, etc). Main LED initiatives identified are skills development for local authorities and settlements, strengthen Regional Education Forum, strengthen local stakeholder platforms, establish regional Local Authority (LA) platform, development of standardized LA profiles, strengthen attachment programmes of technical and vocational skills training facilities in region, regional trust fund establishment, develop strategies for improving revenue collection for LAs/settlements, explore support towards Public Private partnerships (PPPs) for servicing land in targeted LAs, engage TransNamib/Ministry of Works and Transport on prime land in LAs, engage Telecom/cellular phone companies (MTC/TN MOBILE), NORED/Namwater on service provision issues in the region, explore incentives for business and industrial development in LA areas, explore PPP's on health services in targeted LA areas, identification of champions for local opportunities.

MINING – Main LED initiatives identified under mining are to establish a regional trust fund, engage mining companies on possible PPPs for developing declared settlements and nearby LAs, engage respective mining company and MRLGHRD on opportunities for SMEs.

SMES/INFORMAL– Key challenges identified include unavailability of affordable business premises, unresponsive business environment, expensive urban land for business purposes, and inadequate support service provision in region. Main LED initiatives identified are formalization of marketing structures in settlements and Local Authorities (LA), training and mentorship support for SMEs and informal sector, assessment of formal business opportunities in targeted localities, support formalization of SMEs and informal, regional fund for supporting SMEs, explore zoning solutions for SMEs, incubation facilities for SMEs, representation of SMEs & informal, advocating for procurement criteria and practices that make participation of local SMEs possible, LAs & regional council & other public agencies (voluntarily) procure from local SME suppliers or contractors, and develop regional database of accredited contractors for local procurement preferences.

CLEAN DEVELOPMENT MECHANISM – Main LED initiatives identified are fuel-efficient wood cook stoves, hybrid biogas-diesel electricity generation for off-grid settlements (e.g. Gam), Affordable clay-house development using sun-baked clay bricks, production of wood pellets from invader bush for sale to the international energy market, local SME manufacture of transportable charcoal retorts, small-scale SME production of charcoal briquettes, avoidance of methane emissions and high value compost production using biogas digesters at communal poultry settlements, composting of municipal organic waste and collection of recyclable municipal waste by SME collectors using cargo bicycles, additional financial support to the Solar Revolving Fund and urban fruit tree orchards using

treated municipal wastewater for irrigation (in addition looking at other uses for the recycled waste water).

4.5 Stakeholder views in 2020

Socio-economic issues and concerns raised by Interested and Affected Persons during the EIA scoping phase in 2008 are summarised below:

Social Issues

- a) What does Opuwo need to do to attract development?
- b) How can the community expect to benefit?
- c) What are the employment and training opportunities for local people?
- d) Need for improved communications with stakeholders.
- e) Need to avoid informal settlement becoming established at the site.
- a) A short mining lifespan should not be allowed to jeopardize long-term farming in the wider area.
- b) What is the intended use of the remaining land, not used by the mine?
- c) What are the Mine Closure plans and what assurance can be given that they will be implemented?
- d) Consider alternative power supplies

5. Legislative, Policy and Institutional Context

5.1 Namibian Legislative Context

Overall, Namibia's legislation is aimed at promoting sustainable development which minimises harm to the environment while maximises socio-economic development. Thus any compliant mining company needs to demonstrate and balance transparent governance, environmental responsibility, social responsibility and economic viability.

The Constitution of the Republic of Namibia (1990) is the fundamental law which contains, inter alia, all the ingredients of the democratic state, including peace, security and political stability, human rights, individual freedoms, civil liberties and multi-party democracy. The relevant articles which address social environmental issues are:

Article 91 Functions of the Ombudsman states: *'The functions of the Ombudsman ... shall include the following:*

- c) *the duty to investigate complaints concerning the over-utilization of living natural resources, the irrational exploitation of non-renewable resources, the degradation and destruction of ecosystems and failure to protect the beauty and character of Namibia;'*

In **Chapter 11 Principles of State Policy, Article 95 Promotion of the Welfare of the People** states that:

'the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at ... (l) maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis for the benefit of all Namibians both present and future;'

However, Article 101 further states that the principles embodied within the same Chapter:

'shall not of and by themselves be legally enforceable by any court, but shall nevertheless guide the Government in making and applying laws. ... The courts are entitled to have regard to the said principles in interpreting any laws based on them.'

The management and regulation of mining activities falls within the jurisdiction of the Ministry of Mines and Energy (MME), with environmental regulations guided and implemented by the Directorate of Environmental Affairs (DEA) within the Ministry of Environment and Tourism (MET).

The Minerals (Prospecting and Mining) Act, No. 33 of 1992

The Minerals (Prospecting and Mining) Act, No. 33 of 1992 regulates the rights in relation to minerals, reconnaissance, prospecting and mining of minerals. Various licence types and their implications are stipulated. The Act details reporting requirements for monitoring of activities and compliance with environmental performance, such as disposal methods and rehabilitation. The Mining Commissioner, appointed by the Minister, is responsible for implementing the regulations and co-operates with other ministries.

Section 50 (f) stipulates that *it shall be a term and condition of any mineral licence that the holder of such mineral licence shall prepare...*

- (i) *an environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations;*

(ii) *if any pollution is likely to be so caused, an environmental management plan indicating the proposed steps to be taken in order to minimize or prevent to the satisfaction of the Commissioner any pollution of the environment in consequence of any prospecting operations or mining operations carried on by virtue of such mineral licence.'*

Section 91 (f) sets out the particulars to be provided to the Ministry regarding any potential environmental aspects:

'(i) the condition of, and any existing damage to, the environment in the area to which the application relates;

(ii) an estimate of the effect which the proposed prospecting operations and mining operations may have on the environment and the proposed steps to be taken in order to minimize or prevent any such effect; and

(iii) the manner in which it is intended to prevent pollution, to deal with any waste, to safeguard the mineral resources, to reclaim and rehabilitate land disturbed by way of the prospecting operations and mining operations and to minimize the effect of such operations on land adjoining the mining area.'

Environmental Management Act, No. 7 of 2007

This Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and the Environmental Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 February 2012.

The Regional Councils Act (No. 22 of 1992) established that the Regional Councils are responsible for the planning and coordination of regional policies and priorities. **Under Article 28**, the powers, duties, functions, rights and obligations of regional councils include overseeing the general implementation of regional development activities. They have the power *"to undertake, with due regard to the powers, duties and functions of the National Planning Commission...the planning of the development of the region for which it has been established"*, bearing in mind:

- *the natural and other resources and the economic potential of such regions, □
the general land utilisation pattern, and*
- *the sensitivity of the natural environment.*

Labour Act, No. 11 of 2007 aims to *"promote and maintain the welfare of the people and .. to further a policy of labour relations conducive to economic growth, stability and productivity"*. It details basic conditions of employment, and health, safety and welfare requirements of employers.

5.2 International (IFC) Performance Standards

These standards¹ were created by the International Financial Corporation (IFC) of the World Bank and require high standards for private sector projects in emerging markets. The IFC Performance Standards are **compulsory** for projects seeking funding from the IFC and they have formed the foundation for a number of other financial instruments, including the Equator Principles. They are also used as a general guidance for best practice in Social and Environmental Impact Assessment of mine developments. The updated 2012 edition of IFC’s Sustainability Framework applies to all investment and advisory clients whose projects go through IFC’s initial credit review process after January 1, 2012. With this update, IFC expects to increase and better communicate its development impact; help client² companies compete in a fast-changing, global economy; improve transparency and accountability; and better engage with communities who are affected by their projects. The revised Performance Standards define clients’ responsibilities for managing their environmental and social risks and are outlined in **Table 5.1**.

Table 5.1. IFC Performance Standards³

<input type="checkbox"/>	Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
<input type="checkbox"/>	Performance Standard 2: Labour and Working Conditions;
<input type="checkbox"/>	Performance Standard 3: Resource Efficiency and Pollution Prevention;
<input type="checkbox"/>	Performance Standard 4: Community Health, Safety and Security;
<input type="checkbox"/>	Performance Standard 5: Land Acquisition and Involuntary Resettlement;
<input type="checkbox"/>	Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
<input type="checkbox"/>	Performance Standard 7: Indigenous Peoples; and
<input type="checkbox"/>	Performance Standard 8: Cultural Heritage.

Shiloam wishes to conform to IFC standards and

Table 5.2 notes where it is compliant with social issues and where actions are required to be compliant in the future.

¹

www.ifc.org/ifcext/enviro.nsf/Content/EnvSocStandards

² The term “client” is used throughout the Performance Standards broadly to refer to the party responsible for implementing and operating the project.

³ <http://www.ifc.org/ifcext/policyreview.nsf/Content/2012-Edition>

Table 5.2. Assessment of IFC compliance requirements

Performance Standard (PS-)	Compliance assessment
PS-1 underscores the importance of managing social and environmental performance throughout the life of a project	This socio-economic baseline report and impact assessment forms part of the project's Environmental Assessment which addresses these objectives. The client has engaged with the Affected Community since the EIA Scoping Phase and should continue to do so.
PS-2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.	Shiloam is transforming from an exploration to a mining company and it needs to be cognizant of this PS-2 as it draws up its policies and codes of practice as a mining company.
PS-3 recognises that increased economic activity and urbanization often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels.	The World Bank Group Environmental, Health and Safety Guidelines contain the performance levels and measures that are normally acceptable and applicable to projects. These will be assessed by the appropriate specialists.
PS-4 Community Health, Safety and Security	Shiloam must avoid or minimize the risks and impacts to community health, safety, and security that may arise from project related-activities, with particular attention to vulnerable groups. Of particular relevance here is the need to reduce community and worker exposure to HIV and to ensure that the security of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities
PS-5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land.	Shiloam has bought Farm and bordering settlements and has retained the few farm workers who were previously employed on those settlements.

<p>PS-6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.</p>	<p>PS-6 Refer to other specialist studies.</p>
<p>PS-7 recognises that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population.</p>	<p>There are no indigenous people, such as the Ju/'hoansi San, on the Shiloam settlements although some may live and be employed on neighbouring settlements. The public participation process should aim to reach farm workers in the area.</p>
<p>PS-8 recognises the importance of cultural heritage for current and future generations.</p>	<p>Some graves have been found which will be addressed by the archaeological specialist. The village area have no other specific cultural value.</p>

5.3 Equator Principles

The Equator Principles are based on the IFC's Performance Standards and on the World Bank Group Environmental, Health, and Safety Guidelines. The Equator Principles⁴ are a framework and set of guidelines for evaluating social and environmental risks in project finance activities (

Table 5.3). They have been adopted by more than 60 international banks to guide their project financing for extractive projects located in the developing world.

The Equator Principles apply to all new projects with a total capital cost of US\$10 million or more, no matter what industry sectors, without geographic requirement, and not specific to mining.

Table 5.3 Equator Principles

<p>Principle 1:</p>	<p>Review and Categorisation</p> <p>Categorisation of projects based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC.</p>
<p>Principle 2:</p>	<p>Social and Environmental Assessment</p>

⁴ www.equator-principles.com

	The borrower has conducted a Social and Environmental Assessment process to address the relevant social and environmental impacts and risks of the proposed project.
Principle 3:	Applicable Social and Environmental Standards The Assessment will refer to the applicable IFC Performance Standards as indicated in Section Error! Reference source not found.
Principle 4:	Action Plan and Management System The borrower has prepared an Action Plan which addresses the relevant findings, and draws on the conclusions of the Assessment.
Principle 5:	Consultation and Disclosure The government, borrower or third party expert has consulted with project affected communities in a structured and culturally appropriate manner.
Principle 6:	Grievance Mechanism To ensure that consultation, disclosure and community engagement continues throughout construction and operation of the project, the borrower will, scaled to the risks and adverse impacts of the project, establish a grievance mechanism as part of the management system.
Principle 7:	Independent Review An independent social or environmental expert not directly associated with the borrower will review the Assessment, the Action Plan and consultation process documentation in order to assist Equator Principles FI's due diligence, and assess Equator Principles compliance
Principle 8:	Covenants Covenants will be linked to compliance such as to comply with all relevant host country social and environmental laws, regulations and permits in all material respects, etc.

5.4 Namibia's Development Context

The following section describes Namibia's long-term strategic framework for developing the country as well as the development strategies and plans of the Kunene Region.

5.4.1 Vision 2030 ¹¹

Namibia's Vision 2030 has been developed as a long-term planning framework for the country. It is built on a set of development objectives, which integrate economic, social and environmental dimensions underpinned by key concerns identified amongst the Namibian people. Its Vision statement is "a prosperous

and industrialised Namibia, developed by her human resources, enjoying peace, harmony and political stability". It provides the long-term policy framework for the Third National Development Plan (NDP3) 2007/08 - 2011/12, the up-coming NDP4 and all other local and regional development plans.

The eight major objectives of Vision are to:

- i. Ensure that Namibia is a fair, gender responsive, caring and committed nation, in which all citizens are able to realise their full potential, in a safe and decent living environment.*
- ii. Create and consolidate a legitimate, effective and democratic political system (under the Constitution), and an equitable, tolerant and free society, that is characterised by sustainable and equitable development and effective institutions, which guarantee peace and political stability.*
- iii. Develop a diversified, competent and highly productive human resources and institutions, fully utilising human potential, and achieving efficient and effective delivery of customer-focused services which are competitive not only nationally, but also regionally and internationally.*
- iv. Transform Namibia into an industrialised country of equal opportunities, which is globally competitive, realising its maximum growth potential on a sustainable basis, with improved quality of life for all Namibians.*
- v. Ensure a healthy, food-secured and breastfeeding nation, in which all preventable, infectious and parasitic diseases are under secure control, and in which people enjoy a high standard of living, with access to quality education, health and other vital services, in an atmosphere of sustainable population growth and development.*
- vi. Ensure the development of Namibia's 'natural capital' and its sustainable utilization, for the benefit of the country's social, economic and ecological well-being.*
- vii. Accomplish the transformation of Namibia into a knowledge-based, highly competitive, industrialised and eco-friendly nation, with sustainable economic growth and a high quality of life.*
- viii. Achieve stability, full regional integration and democratised international relations; the transformation from an aid-recipient country to that of a provider of development assistance.*

Achieving Objective (vi.) forms the crux of this project as the natural capital is both the Copper underground and the productive land around it. Both should be developed for the well-being of the country.

5.4.2 Namibia's Millennium Development Goals (MDGs)

Namibia has been making variable progress towards the 8 MDGs it set itself in 2004. The goals are:

- Eradicate extreme poverty and hunger*
- Achieve universal primary education*
- Promote gender equality and empower women*
- Reduce child mortality*

www.npc.gov.na/vision/vision_2030bgd.htm

- *Improve maternal health*
- *Combat HIV/AIDS, malaria and tuberculosis (TB)*
- *Ensure environmental sustainability*
- *Develop a global partnership for development*

The mine should be able to make a contribution to these development goals through its contribution to the economy and any social upliftment programmes that it chooses to support. Its biggest contribution is expected to be towards the first goal, provided that it does not mine to the detriment of farming in the surrounding community and long term environmental sustainability of the area.

5.4.3 The Fourth National Development Plan 2012- 2017

The overarching goals of the Fourth National Development Plan 2012- 2017⁵, which are adopted from Vision 2030, are:

- High and sustainable growth
- Employment creation and □
Increase in income equality.

The first Priority is to improve basic enablers and thus create an enabling environment, improve education and skills management, establish a quality health system, addressing extreme poverty and upgrade public infrastructure needed for our industries to perform at the required level of output. The desired outcome is to have cleared the backlog of critical economic and social infrastructures and to have established the appropriate balance between maintenance and expansion of new infrastructures

The second Priority defines our economic approach under NDP4 with a strong focus on services and manufacturing as required by Vision 2030 and Namibia's recently adopted Industrial Policy, as well as a continued focus on agriculture and rural development.

The third Priority is the execution strategy. Our overall desired outcome under this strategic area is that, driven by improved monitoring and evaluation mechanisms, as well as improved accountability supported by appropriate reward and sanction schemes, and an entrenched culture of performance management in the public sector, the execution rate of NDP4 (both in terms of timeliness and quality) would have improved significantly.

⁵ NPC. 2012. *Fourth National Development Plan 2012- 2017*. Third draft dated 12 April 2012

NDP4 intends to put in place a funding mechanism, including a public-Private-Partnership framework and guidelines for concessions, including partial and full privatisation, to ensure delivery of infrastructure, while at the same time maintaining macroeconomic stability.

5.4.4 NEEEF

In 2004, Cabinet mandated the Office of the Prime Minister to undertake wide-ranging consultations with relevant stakeholders with a view to design a Black Empowerment Policy that was renamed, Transformational Economic and Social Empowerment Framework (TESEF) in May 2006.⁶ In October 2011, this was revised and was tabled in parliament as the New Equitable Economic Empowerment Framework (NEEEF). The Prime Minister has clarified that sector specific Charters will only be implemented when NEEEF legislation has been put in place⁷.

NEEEF consists of policies designed to encourage the private sector to become more equitable and to make a greater contribution towards national economic empowerment and transformation. The NEEEF will be based on voluntary business practice. Government will use all the legitimate market mechanisms at its disposal, in the form of its procurement programmes and licensing regimes, to promote transformation and empowerment.

The NEEEF will promote transformation in business through five empowerment pillars⁸:

- i. Ownership - Minimum of 25% ownership by historically disadvantaged Namibians (HDN) – it can include Employees Share Ownership Programmes, assisting women, youth and people with disabilities;
- ii. Management Control and Employment Equity - Minimum of 50% of board and management filled by PDN;
- iii. Human Resources and Skills Development – A training levy to the National Training Authority equivalent to 1.5% of gross wage bill;
- iv. Entrepreneurship Development – procurement spending allocated to businesses owned by HDN
- v. Community Investment – At least 1% of after-tax profits.

5.5 Institutional Context

⁶ <http://209.88.21.36/opencms/opencms/grnnet/OPM/ProgramsProjects/Tesef.html>

⁷ Chamber of Mines. Dec 2011. *Statement at the Mining Industry briefing meetings with MME.*

⁸ GRN. 2011. *The New Equitable Economic Empowerment Framework (NEEEF).*

The two local authorities – Opuwo Town Councils and the Kunene Regional Council are described in **Chapter 4**, as they are directly affected parties.

5.5.1 National Government

The National Planning Commission (NPC) is responsible for planning government priorities and directing the course of national development which is then implemented by the various government Offices, Ministries and Agencies. Of particular importance to the project and the surrounding area are:

- **The Ministry of Mines and Energy (MME)** facilitates and regulates the development and sustainable utilization of **Namibia's** mineral and energy resources for the benefit of all Namibians
- **The Ministry of Agriculture Water and Forestry (MAWF)** is mandated to promote, develop, manage and utilize agricultural, water and forestry resources. It wants to diversify agricultural practices and products, create jobs, improve competitiveness, develop Namibia's market locally, regionally and internationally, ensure potable water and basic sanitation services, promote integrated environmental management, improve regulatory environment, build capacity for the people, promote food safety standards and most of all, ensure food security.
- **The Ministry of Environment and Tourism (MET)** is tasked to manage the country's ecological processes and life-support systems, conserve biological diversity, and ensure that natural resources are sustainable for the benefit of all Namibians, both present and future.
- **The Ministry of Works and Transport (MWT)** is tasked to provide effective transport infrastructure and specialised services. This includes the Roads Authority (RA) which manages the national road network with a view to support economic growth.
- **The Ministry of Labour and Social Welfare (MLSW)** is responsible for the execution of the Labour Act No. 11 of 2007, the Social Security Act No. 34 of 1994, the Employees Compensation Amendment Act No. 5 of 1995 and the Affirmative Action Act (Employment) No. 29 of 1998. The various Acts stipulate, amongst other things, sound labour relations, employment equity, fair employment practices, training, minimum basic conditions of service, workplace health and safety and retrenchment. Compliance is enforced and monitored by the Ministry of Labour through the office of the Labour Commissioner.
- **The Ministry of Health and Social Services (MHSS)** oversees policy formulation, provides health facilities and manages healthcare provided by regional directorates.
- **The Ministry of Education (MoE)** provides pre-primary schooling, formal general education at primary and secondary level (grades 1-12), higher education, vocational education and training, education for out-of-school youth and adults and life-long learning.
- **State Owned Companies** such as the Roads Authority, NamPower, NamWater, TransNamib and Telecom.

5.5.2 Chamber of Mines of Namibia

In the 42 years of its existence, the Chamber of Mines of Namibia has grown to a membership of 95 members (as of September 2011) and represents the interests of all the major mining and exploration companies active in the country. Its mission is *to efficiently promote, encourage, protect and foster responsible exploration and mining in Namibia to the benefit of the country and all stakeholders*. In its transformation process and to maintain and enhance the reputation of the Namibian mining industry, Council members introduced the new Chamber Code of Conduct and Ethics. All members of the COM have to automatically, upon accepting membership of the COM, become subject to the code of conduct & ethics, as a condition of COM membership.

The Codes have a number of priority areas:

1. Employment and human resource development
2. Procurement and supply chain management
3. Technology transfer and intellectual property rights
4. Environmentally safe production, products and services
5. Environmental impact assessment and management
6. Health and safety of employees
7. Labour standards
8. Corporate governance

One of the requirements is for members to give preference to goods and services available in Namibia, provided that they are of comparable quality and competitively priced. Similarly, members must to give preference to Namibians when employing workers for their operations within Namibia.

The Charter for Sustainable and Broad-Based Economic and Social Transformation in the Namibian Mining Sector (The Namibian Mining Charter) has been developed in partnership with the Namibian Chamber of Mines who submitted their version to Cabinet in September 2010. In April 2011, Cabinet declared uranium, copper, Copper, zinc and coal as strategic minerals to allow the State-owned Epangelo Mining Company “exclusive exploration and mining” rights. The CoM is considering retracting the Mining Charter if government forces equity upon them. The Mining Charter has been developed as an instrument to effect transformation and sets specific targets for mineral licence holders active in Namibia. It is designed to address the issue of sustainable and broad-based economic and social transformation.

The Mining Charter is based on the following five transformation pillars:

Pillar 1: Ownership

All mining, development and exploration companies are required to make a minimum of 5% equity available for sale exclusively to HDNs within two years of the Charter coming into force.

Pillar 2: Education and Skills

Mining companies must invest at least 2% of their annual gross payrolls every year in developing the skills of HDN employees and other HDNs.

Pillar 3: Affirmative Action

Operating mining companies are required to achieve HDN in Management targets within ten years commencing with a 20% target in 2012 and aiming towards 60% in 2020. New operating companies commencing operations after the date of this Charter will have to achieve the following targets for HDN representation at all management levels combined:

- End 2012 – 20%
- Within 2 years of the date of first sale of product – 30%
- Within 4 years of the date of first sale of product – 40%
- Within 6 years of the date of first sale of product – 50%
- Within 8 years of the date of first sale of product – 60%

Pillar 4: Procurement and Enterprise Development

Mining companies are required to direct the following proportions of discretionary expenditure to Namibian-owned businesses provided they are internationally cost and quality-competitive:

- In the period to end 2015 – 25% of discretionary expenditure
- From 2016 to end 2020 – 40% of discretionary expenditure

During periods of mine construction or significant expansion, this spending requirement shall be reduced by 50%.

Pillar 5: Communities and Infrastructure

The objective of this pillar is to ensure that mining companies contribute towards the transformation and upliftment of the communities in which they operate as well as the country as a whole. The requirement for mining companies is to commit 0.5% of their turnover in respect of their Namibian operations (in the case of an operating company) or 0.5% of their development or exploration costs (in the case of a development or exploration company) on assisting Namibian communities or contributing towards infrastructure in excess of what is required for their own operations.

6. The Socio-economic Context

6.1 Land use

6.1.1 Freehold land

6.2 Labour and income

The labour force in Kunene is approximately 22,000 people, of whom about 15,000 are male. The labour force participation rate (LFPR) or the economically active population and is the proportion of the working population (both employed and unemployed) over 15 years old.

The 2008 Namibia Labour Force Survey found that the national unemployment rate was 51.2%. Unemployment rates (using a broad definition) in Kunene Region are significantly higher among women (65%) compared to 27% male unemployment. Youth unemployment (15-34 years) is below the national average at 50% but young women, have the highest unemployment rate in the region, 73% compared with men 31%²⁰.

Of those employed in the region, approximately 51% are employed in the private sector, 22% are employed by government and parastatals and approximately only 9% are subsistence headmen /farm workers. The manufacturing sector that includes mining, quarrying, electricity, gas and construction, accounts for nearly 12% of the workforce, whereas 31% work in the agricultural, hunting and forestry sector. The largest occupational group is elementary occupations which includes labourers and other unskilled occupations and constitute 40% of all those employed.⁹

The main source of income in the region is derived from wages and salaries which make up 54% of a household's total income source. Business and non-farming activities accounts for 5% whilst cash remittances sent home by family members from elsewhere account for 13% and 12%²². Over the whole region, 13% of households rely on pensions and only 10% on subsistence agriculture and cattle rearing²³.

6.2.1 Early Childhood Development

In Namibia, early learning opportunities for young children are extremely limited, especially in rural areas. Programmes for the 2-5 year olds are primarily community or privately run with little or no government funding. The MoE is re-introducing state support for pre-primary education for the 5-6 year olds, while the Ministry of Gender and Child Welfare (MGEWCW) has overall responsibility for other ECD centres.

Three thousand (24%) of the region's 3-6 year olds are attending the 81 ECD centres in the region as in March 2011 but only 41% of their caregivers have received any training in ECD. Perhaps of greatest concern is that almost half of the centres have no trained staff at all. Many ECD centres simply enable mothers to go out and earn a living. ECD centres charge fees ranging from N\$50 – N\$400 per month, depending on their catchment areas.

6.2.2 Primary and Secondary Education

Opuwo has three primary schools: Opuwo Primary, Shalom and a German private school. The government's contribution to primary schools equate to approximately N\$54/learner/year for textbooks, stationery, cleaning materials etc.

Opuwo Primary has 550 learners from pre-primary to Grade 7, with 18 teachers. It has a shortage of classrooms so the pre-primary occupies the garage and a grade 1 class is taught in a large military tent outside. Class sizes vary from 17-49 children/class; they have little or no equipment & textbooks. The school development fees are N\$70/term and are paid by approximately 70% of the children. A new school plot has been allocated for 36 classrooms but the ministry has no money to build. The staff share one computer and printer between them; there is no internet access. The school runs a school feeding programme using some of the school fees and donations.

Shalom Primary has 889 learners taught by 30 staff. Five of the classes of Grade 2 and 3 have to attend afternoon school which is a severe handicap for those learners as they usually arrive hungry and tired. Shalom offers Grade 1-3 in KhoeKhoe, English & Afrikaans and from Grade 4 onwards in both English and Afrikaans. School development fees are N\$180/year and are only paid by less than 50% of the learners.

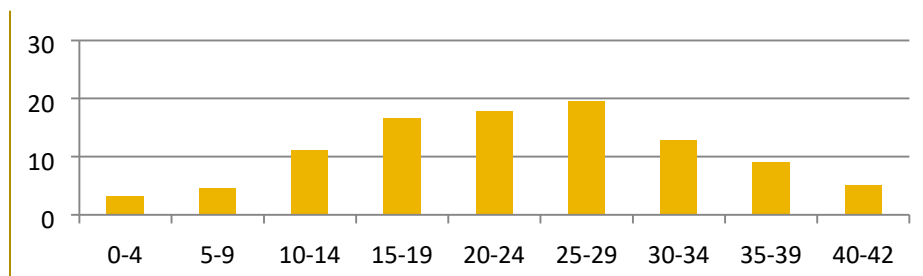
Kharob Secondary School was originally a primary school and has expanded to offer Grade 12 ordinary level and higher level in Science, Biology and Geography. Of the 70 matriculates in 2010, about 55% passed. Through the US Government funded Millennium Challenge Account (MCA), Khorab school will be extended by January 2013 on a nearby site. The new facilities will include a physical science laboratory, four classrooms, a computer laboratory and an ablution block. It will also include the renovation and reclamation of the old hostel, which is currently being used by Opuwo school. Khorab school development fees are N\$450/annum and are paid by approximately 60% learners. Government's contribution to textbooks and stationery is approximately N\$69/learner/year, which does not cover even one textbook.

Some secondary school children in the Opuwo area attend school in Tsumeb, 63km north of Opuwo.

In Namibia poor Grade 1 performance may be linked to lack of ECD opportunities. Nationally, grade 1 repetition rates increased from 18.9% in 2002 to 20.7% in 2008. School leaving rates in grade 1 increased from 2.3% in 2002 to 4.2% in 2008¹⁰. This is a unique and defining feature of Namibian education that one child in every five is a repeater. There are about 550 000 learners in grades 1-10 and 110 000 of these have repeated at least one year of school. They occupy the time of 3 600 teachers and the space of over 300 schools which is a huge economic burden on the country. Grade 10s don't 'fail'; there are simply no places for them in grade 11 and so the Ministry of Education uses the results as a means of limiting entry. There is no standard required at grade 10 for progression to grade 11 because the grade 12 examination has been designed from the outset to cater for all abilities¹¹.

Out of 35 640 candidates who registered for the grade 10, Junior Secondary Certificate (JSC) examination nationally in 2011, 18372 have qualified for admission to grade 11 in 2012 on the minimum requirement of 23 points in their best 6 subjects and above with an F grade (symbol) in English. This represents 51.5% if compared to 51.2% in 2010¹²¹³. **Figure 6.5** shows the % of learners who attained levels in the Junior Secondary Certificate (grade 10) in 2009 in Kunene Region where the region performed better than both Khomas and Omaheke regions³⁸.

Figure 6.5. % of learners attaining point ranges (0-42) in the JSC examination in 2009



Learners who drop out of school early or who want to improve their grades can continue their education through distance learning at the Namibian College of Open Learning (NAMCOL).

Table 8.1. Criteria for assessing impacts

PART A: DEFINITION AND CRITERIA	
Definition of SIGNIFICANCE	Significance = consequence x probability
Definition of CONSEQUENCE	Consequence is a function of severity, spatial extent and duration

¹⁰ MoE. 2011, Ibid

¹¹ Clegg, A. 2011. *The Namibian education Time Bomb*. The Namibian 01.02.2011

¹² http://www.moe.gov.na/news_article.php?id=49&title=Results of The 2011, Junior Secondary Certificate

³⁸ MoE. 2011, Ibid

¹³ <http://www.cosdef.org.na/>

Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE

SEVERITY = L

DURATION	Long term	H	Medium	Medium	Medium
	Medium term	M	Low	Low	Medium
	Short term	L	Low	Low	Medium

SEVERITY = M

DURATION	Long term	H	Medium	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Low	Medium	Medium

SEVERITY = H

DURATION	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High
			L	M	H

	Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
SPATIAL SCALE			

PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M= medium and L= low and + denotes a positive impact.

Issue: Change of Land Use

Project phase and link to activities/infrastructure

Construction	Operational	Decommissioning	Closure
Activity/constructing the mine	Activity/mining	Activity/dismantling	Activity/see Mine closure Plan

Assessment of impact

The land use prior to Shiloam Copper small livestock farming. The average homestead in this area of Namibia is about 2 ha on which an average of 8 people are usually living, including the owner.

Land cleared of bush can be restored to productive cattle and game farming. The chopped bush can be utilised in a number of products such as firewood, charcoal production, wood chips for bush blocks and

power production. Bush clearance does create employment and it can be managed in such a way as to sustainably harvest bush on a continuous basis as it grows back sometimes more vigorously than before.

During construction, there will be up to 100 workers on site and the probability of poaching will be high. The mining footprint will be a small proportion of the village area and once mining operations commence, much of the land use could be used for farming and bush clearance, if not cattle farming. From post closure, the pit and waste rock dumps will cause irreversible land use change of moderate severity within the site boundary but the remaining land could be returned to ranching beef cattle and game farming. The mine closure plan should include looking at land use options for the pit for fish farming or recreation.

The consequence is therefore of medium severity. The probability is high but with a medium consequence, the significance is also medium.

Tabulated summary of the assessed impact

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

Conceptual description of mitigation measures

Mitigation objectives should be to manage the non-mining areas as productively as possible, including restoring bush encroached areas for productive farming. Shiloam has already adopted this approach and has employed a property manager to manage the land around the mining area.

During construction, the construction camp and mining area should be fenced as early as possible to minimise security problems on the Shiloam and neighbouring settlements.

Nevertheless, given the nature of mining, the assessment rating remains the same even with mitigation measures applied.

Emergency situation

Control of bush fires is discussed under **Section 8.7**, Community Health, Safety and Security.

8.3 Socio-economic impacts on neighbouring community

Project phase and link to activities/infrastructure

Exploration	Construction	Operational	Decommissioning	Closure
Activity: exploration & design	Activity/constructing the mine	Activity/mining	Activity/dismantling	

Assessment of impact

The closest direct neighbouring communal area is the Ombarandu area.

Since 2018, neighbouring communities have had the stress of possible impacts that might occur due to mining. The main perceived threats include:

- Their land may devalue due to mine development
- Lowering of the groundwater and consequent long-term threat to sustainable farming
- Loss of sense of place and subsequent loss of livelihoods from tourism during construction and operations.
- Squatter camps and reduction of safety.
- The increase in traffic on the road.

It should be recognised that fears and the possible devaluation of land are negative impacts which occur at design stage, although they are of low severity and consequence but medium significance.

For the duration of construction, mining and decommissioning, the severity of the impact could be moderate and it would extend locally beyond the site boundary, thus the consequence with no mitigation is rated as medium. The impact is possible and frequent thus the probability is medium thus the significance is medium. Some mitigation measures are possible which could reduce the severity and the consequence to low. However, as the probability remains likely, the significance remains moderate.

At post closure, these socio-economic impacts should cease.

Tabulated summary of the assessed impact

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

Conceptual description of mitigation measures

Shiloam should foster and maintain good relations between the mine and neighbours as the basis for mitigation. Mitigation and compensation measures can reduce the severity of some impacts and these include:

- Establish a platform for on-going dialogue with neighbouring headmen, as a special interest group.

- The mine should give the most affected neighbouring settlements opportunities to provide goods and services, as a form of compensation, e.g. to run a shop, provide farm produce and visitor accommodation.
- The construction workers camp must include some senior management to ensure controls are enforced.
- Shiloam should grow bush fences/ thick shrubs around the farm's perimeter as a shield from noise and dust and to prevent walkers.
- Enforce strict rules of no walking except along roads.
- Seek local opinion on the least disturbing blasting times, such as between 12h00 and 14h00.

Emergency situation

Maintaining good relations with neighbours and a clear point of contact will enable a speedy response to an emergency situation.

8.4 Employment and skills training opportunities

Project phase and link to activities/infrastructure

Construction	Operational	Decommissioning	Closure
Activity/constructing the mine	Activity/mining	Activity/dismantling	Activity/see Mine Closure Plan

Assessment of impact

Before mining commences, Shiloam will need to undertake considerable earthworks and construction requiring building, mechanical, platework, piping and electrical skills. Construction is likely to take about 18 months requiring a workforce of about 100 people, peaking to about 200 people at times.

The construction workforce will be on contract, working shifts to enable work to be carried out 24 hours/day, seven days a week. The majority of these jobs will be for semi-skilled and skilled personnel and usually one large construction company is contracted.

The personnel requirement for the mining operations will range from 211 to 328 personnel over the eleven year period, as detailed in **Table 8.2**. This gives an average mining labour force of 291 people. **Table 8.2**.

Changes in personnel requirements for the mining component through the LOM

Job title	Grade	2014	2020	2023
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Manager - Mining	9	1	1	1
Manager - Technical Services	9	1	1	1
Manager - Mining - PA	4	1	1	1
Manager - Technical Services - PA	4	1	1	1
Management Team		4	4	4
Surveyors	6 - 7	2	3	3
Samplers / Assistants	2 - 4	2	4	4
Geologists	7 - 8	3	5	5
Geo-technicians / Rock Engineers	6 - 7	2	2	2
Job title	Grade	2014	2020	2023
Mining Engineers	6 - 8	3	3	3
Draughtsman	5	1	2	2
Mine Technical Services Team		13	19	19
Superintendent - Drill & Blast	8	1	1	1
Mining Engineers	7	2	2	2
Foreman	4	5	5	5
Blasters	3	2	3	2
Operators	2	17	26	22
Assistance	1	15	25	18
Other		2	2	2
Production Crew - Drill & Blast		44	64	52
Superintendent - Load & Haul	8	1	1	1
Mining Engineers	7	1	1	1
Foreman	5	4	4	4
Pit Control Operators	4	4	4	4
Operators	3	88	153	119
Assistance	1	4	6	6
Other		2	2	2
Production Crew - Load & Haul, Secondary		104	171	137
Superintendent - Mine Maintenance	8	1	1	1
Mining Engineers – mechanical & electrical	7	2	2	2
Foreman – electrical, drill, shovel, truck & equipment maintenance	6			

Artisans – diesel, auto-electrics, hydraulic mechanics, boilermaker	5	5	5	5
Assistance	1 - 2	20	38	38
Operators	4	10	16	16
Other		1	1	1
		7	7	7
Mine Maintenance Crew		46	70	70
Total Mining Workforce		211	328	282

The management of the tailings facility will require a further 28 personnel as shown in **Table 8.3**.

Table 8.3. Personnel requirements for the tailings facility

Job title	Number
Senior Management (local)	1
Management	1
Supervisor – Health and Safety	1
Supervisor - IR	1
Senior Professional	1
Tailings Engineer	1
Job title	Number
Supervisor – General	1
Semi-skilled	1
Unskilled	20
Total	28

In addition, the personnel requirement for the processing plant totals 135 and is detailed in **Table 8.4**.

Table 8.4 Personnel requirements for the processing plant

Occupation	Department	Grade	Number
Metallurgy Manager	Process Plant - Day Shift	9	1
Engineering Manager	Process Plant - Day Shift	8	1
Production Superintendant	Process Plant - Day Shift	8	1
Design Engineer	Process Plant - Day Shift	7	1
Plant Metallurgist	Process Plant - Day Shift	7	1
Safety Officer	Process Plant - Day Shift & Mine		

Asset Protection Leader	Process Plant - Day Shift	6	2
Human Resource Officer	Process Plant - Day Shift	6	1
Training Officer	Process Plant - Day Shift & Mine	6	1
Engineering Foreman	Process Plant - Day Shift	5	2
Shift Foreman	Process Plant - Day Shift	6	4
Human Resource Assistant	Process Plant - Day Shift & Mine	5	4
Registered Nurse	Process Plant - Day Shift	4	2
Services Attendant	Process Plant - Day Shift	5	2
Attendant	Process Plant - Crushing	2	2
Operator	Process Plant - Crushing	2	2
Attendant	Process Plant - Milling & Gravity	3	4
Operator	Process Plant - Milling & Gravity	2	4
Supervisor	Process Plant - Milling & Gravity	3	4
Attendant	Process Plant - Leach Section & Thickeners	2	4
Operator	Process Plant - Leach Section & Thickeners	3	8
Operator	Process Plant - CIP, Residue & Elution	4	1
Attendant	Process Plant - Smelt House	2	4
Supervisor	Process Plant - Smelt House	3	8
Foreman	Process Plant - Smelt House	3	8
Fitters	Process Plant - Engineering	2	3
Electricians	Process Plant - Engineering	5	1
Instrument Technicians	Process Plant - Engineering	5	1
Boiler Makers & Welders	Process Plant - Engineering	5	5
Engineering Assistants	Process Plant - Engineering	5	3
Shift Leader	Process Plant - Asset Protection	5	3
Reviewer	Process Plant - Asset Protection	5	3
Asset Protection Officer	Process Plant - Asset Protection	5	4
		2	7
		4	5
		4	1
		4	8
Occupation	Department	Grade	Number
Senior Asset Protector	Process Plant - Asset Protection	4	8
Laboratory & Sample Preparation Total Staff	Process Plant - Laboratory	5	20
Total			135

As the mining operations scale up, these personnel estimates show that between 45 and 60 jobs will be required for unskilled / virtually unskilled people during mining operations. No unskilled labour will be required in the processing plant. For semi-skilled personnel, there will be approximately 46 – 58 jobs created in the mining operations and a further 24 in the processing plant. There will be approximately 119 – 183 operators required (grade 3) who will be trained to drive a range of vehicles and operate plant machinery. A further 164 – 190 skilled artisans and professionals will be required to ensure the whole mine operates efficiently, 24/7.

The whole mining and processing operation will thus **create an average of 454 jobs** which will peak to 491 jobs in 2024.

Simonis Storm¹⁴ surveyed a large number of suppliers of goods and services in the uranium mining industry in Namibia and calculated that for every job created by a mine, a further additional 1.5 job opportunities are created by suppliers and contractors. If this is similar for the Copper mining sector, it would result in **a further 680 jobs** created by suppliers, contractors and service providers.

Through employment and skills development, the proposed mine will contribute to the three national development goals of NDP4 – reducing income inequality, increasing job creation and economic growth.

It will also contribute to the Kunene Regional Council’s strategic objective “to improve regional economic development and employment. One of the government’s requirements in the New Equitable Economic Empowerment Framework (NEEEF) is that employers such as Shiloam must contribute to skills development by paying a training levy to the National Training Authority equivalent to 1.5% of its gross wage bill. The second pillar in the Chamber of Mines Mining Charter is that mining companies must invest at least 2% of their annual gross payrolls every year in developing the skills of historically disadvantaged Namibians.

The economic spin-offs from the mine’s construction and operations will create empowerment opportunities in a range of skills and activities. Employment provides incomes to the employees, their immediate household members and to others living elsewhere in Namibia who depend on cash remittances.

Thus the assessment of this impact can be summarised as having a high beneficial effect. The work experience and skills gained through the opportunities that the mine brings will have lasting benefits for all employees, nationally.

Tabulated summary of the assessed impact during construction and operations

Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H+	H	H	H+	H	H+

¹⁴ Simonis Storm Securities 2010. *The Namibian uranium industry: Economic impact and counter valuation*

Enhanced	H+	H	H	H+	H	H+
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On mine closure, the loss of employment at the mining company and with suppliers of goods and services to the mine and wider communities is likely to have a long-term negative impact, unless other job opportunities are available in Namibia.

Tabulated summary of the assessed impact during decommissioning and closure

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

Description of enhancement measures

The enhancement objective is to maximise employment and skills development opportunities for the local and national population.

Shiloam is strongly supportive of Namibia’s policies to recruit Namibians wherever possible. Mining and processing requires a mostly semi-skilled to highly skilled labour force so there is a great need to provide up-front skills training, particularly to potential employees currently living in the local towns of Opuwo. Skills acquisition/upgrading provides greater opportunities for the local labour force to participate in the project and makes a crucial contribution towards long-term sustainability, beyond the life of mine. It can also contribute to improving gender equality and the empowerment of women. The baseline has shown that unemployment among women in the region is far higher than among young men.

By stipulating certain requirements and preferences within its tender documents, Shiloam can influence the extent to which the construction company and contractor workforce is proactive in recruiting from local towns and in providing skills training.

It will be in Shiloam’s interest to recruit from the region as the employees are more likely to stay and not move to other mines. Its employment criteria must be based on qualifications and experience yet all other things being equal, preference can be given to local people and women.

Specific enhancement measures include:

- Weighting tender selection in favour of suppliers of goods and services which use local suppliers down the supply chain.
- Mine procurement policies that promote the use of small and medium enterprises.

- A human resources policy which prioritises the selection of women for training and recruitment and which supports women to perform well in the workplace while balancing their other duties in the family and community.
- Skills development strategies and programmes should be in place prior to construction to maximise use of the local labour force.
- Support employees and community members to continue learning and developing skills so they too benefit from being able to offer labour flexibility and productivity, throughout the LOM and on mine closure.

Emergency situation: early mine closure

The most relevant emergency situation would be unexpected mine closure leading to a loss of jobs. Shiloam should plan for mine closure before it begins to operate. Mitigation measures should:

- Promote continuous learning programmes to diversify and upgrade skills;
- Ensure skills upgrading during employment at mine is documented and accredited where possible so skills are recognised with future employers;
- Maximise the permanent workforce and make pension plans compulsory;
- Provide training on personal financial management;
- Enable and promote home ownership throughout the workforce;
- Assist Opuwo town councils to diversify their economic activities.

8.5 Impact: In-migration

Project phase and link to activities/infrastructure

Construction	Operational	Decommissioning	Closure
Activity/constructing the mine	Activity/mining		

Assessment of impact

The project has relatively high labour requirements, for both the construction and operations phase, which is likely to exceed local capacity, especially for semi and skilled work. In addition, with national

unemployment at 51.2%, the lure of employment opportunities will encourage people to move to the mine's recruitment points.

The construction phase will last about 18 months and will require a workforce of about 200 people which will peak to 800 people at times. Operations will require about 454 people over the 11 year life of mine.

Given the number of jobs to be created by the project, **Table 8.5** estimates the potential number of people who could descend on Opuwo to range from 3 700 to over 12 000 migrants. **Table 8.5.** Low, medium and high in-migration scenarios

Phase	Workforce estimates	In-migration scenario		
		Low (x3)	Medium (x6)	High (x10)
Construction	800	2 400	4 800	8 000
Operations	454	1 362	2 724	4 540
Total potential migrants	1 254	3 762	7 524	12 540

In this case, project induced in-migration is more likely to follow the medium scenario as two determining factors are relevant for this project:

- i. Namibia has been experiencing rural – urban migration since independence, particularly from the agricultural subsistence-based northern regions. High unemployment and underemployment, highly concentrated development in a few urban centres and a relatively low per capita GDP are factors which indicate the country is likely to experience high levels of internal migration towards economic opportunity.
- ii. The project has relatively high labour requirements, for both the construction and operations phase, which is likely to exceed local capacity, especially for semi and skilled work.

However, Opuwo's capacity to meet the needs of the project, in terms of available goods and services, is good. Therefore it would be sensible for the two towns to anticipate and plan for substantial in-migration of around 7 000 people, shared between the two towns.

Most town councils perceive rapid in-migration as a threat and an inevitable but unwanted problem. Some try to implement restrictive policies which nearly always fail and often do great damage to the economy and to the lives of the migrants and their families. Migrants are often the movers and shakers of their communities, the people with the drive and ambition to have a better future and this potential energy should

be tapped not thwarted where possible. Migrants are generally seeking improved living conditions and economic opportunities from where they have come from. They may be returning family or extended family members originally from the area, project employees from outside the area with or without their families, opportunistic entrepreneurs in the formal and informal sectors, unskilled or skilled job seekers.

In the local context, Opuwo has suffered out-migration and now has half the population it recorded ten years ago. By contrast, Opuwo has grown by 10,000 people. Although every town council wishes a wealthy, rate-paying population, numbers are important to generate economic activity. Opuwo Council is actively wooing Shiloam to base its operations in Opuwo and it is likely to be happy to have any in-migration to boost its population. Opuwo has been struggling to get government resources but may be receiving enough to tar its main roads this year..

In-ward migration can have positive and negative impacts such as:

- Stimulating the local economy and community organization. Mineworkers will require housing and this will stimulate the construction of housing in both Opuwo. Wages and salaries will be injected into the local economy where they live; hence Opuwo's eagerness to have the town as Shiloam's base.
- Developing informal settlements which increase demand/ need for basic infrastructure – housing, clean water supplies, sanitation, electricity and waste management systems.
- Increasing pressure on government services such as health and education facilities, their staffing and running cost requirements.
- Increasing incidence of social ills including alcoholism, drug abuse, prostitution, gambling & criminality. This is discussed and assessed in the next section on Community Health.

On mine closure, this may be reversed and the towns will experience an exodus of people, a drop of house prices and reduce business turnover. All symptoms of a boom and bust economy.

Tabulated summary of the assessed impact

Impacts caused by in-migration	Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Stimulating the local economy	Unmitigated	M+	M	M	M+	M	H+
	Enhanced	M+	M	M	M+	M	H+
Development of informal settlements	Unmitigated	H	H	M	H	H	H
	Mitigated	M	H	M	H	H	H
Increased pressure on government services	Unmitigated	H	H	M	H	H	H
	Unmitigated	L	H	M	M	H	M

Conceptual description of enhancement measures

Impact: Stimulating the local economy and community organisation

- Shiloam should avoid constructing mine housing in compounds in the nearby towns but should promote integration in existing residential areas, wherever possible. Home ownership should be promoted but many employees will prefer to invest in their areas of origin, which may not be from the Kunene Region. Such employees would then rent accommodation in Opuwo.
- Shiloam's Corporate Social Investment (CSI) strategy recommends support to local economic development in Opuwo from its operations phase. This will encourage, stimulate and support SME development.

Description of mitigation measures

Impact: In-ward migration

To minimise inward migration, the following measures should be implemented by Shiloam from planning and construction throughout operations:

- Build up local skills before operations begin by working with local training establishments, providing bursaries for key skills.
- Actively recruit women for training and employment into the mining sector.
- Give preferential recruitment to Kunene residents.
- Include recruitment of Grade 10 school-leavers who pass an IQ, English and Maths test

Impact: Development of informal settlements which increase demand/ need for basic infrastructure, such as serviced plots and waste management systems.

- Through its CSI strategy, Shiloam should partner the National Housing Action group (NHAG) and the Shack Dwellers Federation (SHDF) to enable residents in Opuwo's informal settlement to negotiate with their town council and to help themselves.
- Shiloam should support the town councils to have enlightened town plans which enable affordable land tenure and business development.

Impact: Increased pressure on government services such as health and education.

- Shiloam should negotiate with the Ministry of Health and Social Services to provide primary health care services to neighbouring settlements, from its mine clinic.

- The Ohorongo Cement and Opuwo Community Trust renovated the government health clinic in Opuwo in 2010. In-migration to Opuwo due to this project may require Shiloam to also contribute to upgrading the government facility.
- Shiloam has already begun to support Opuwo schools through its CSI programme. It will continue to listen to the schools priority requests and assess how it can best provide support.

8.6 Community Health, Safety and Security

Project phase and link to activities/infrastructure

Construction	Operational	Decommissioning	Closure
Activity/constructing the mine	Activity/mining	Activity/dismantling	Activity/Mine closure

Assessment of impact

In-migration usually leads to an increased incidence of social ills including alcoholism, drug abuse, prostitution, gambling & criminality. Alcohol abuse is part of the accepted social norm in Namibia and is often stimulated by cash earnings which increase the likelihood of domestic violence (usually against women and children), unprotected sex and the spread of HIV. The influx of job seekers may increase overcrowding, which increase the spread of TB.

Neighbouring settlements are concerned about their security and safety, particularly during construction when up to 800 people will be housed on site for over a year. They are concerned about the increased traffic on the B1 and road safety at the mine turn-off.

Unmanaged and unmitigated, these social ills can have severe consequences which last beyond the life of mine. Some subtle factors can influence the impact such as the degree of cultural cohesion and the community's age structure. A number of policies and actions can be taken which can mitigate the impact and reduce its significance to medium. These efforts must be carefully co-ordinated with those of local government and the community, through planned engagement and public-private partnerships.

On closure, unemployment and economic decline can lead to a different set of social ills.

Tabulated summary of the assessed impact

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

Description of mitigation measures

The mitigation objective is to promote community health, safety and security in the neighbouring farming community and local towns. Mitigation measures should include:

- The formation of a representative stakeholder committee, genuinely representative of those most affected by the project – such as landowners, farm-workers, town councils and residents committees –to assist with the monitoring of social impacts and the effectiveness of the mitigation measures put in place.
- Fence in the construction village and mine site and employ strict security. Shiloam must ensure that the security of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the neighbouring community.
- Repeatedly inform the public that no workers will be recruited at the site gate to protect direct neighbours.
- Take measures to prevent Platveld from becoming a squatter settlement.
- Shiloam must have zero tolerance to alcohol in the workplace and on site and breathalyse all personnel arriving for work.
- Establish a comprehensive HIV / AIDS / TB workplace policy and community wellness programme. Tender requirements for all contractors should stipulate clear HIV policies and programmes and should be part of their reporting requirements. Shiloam should include support community HIV/AIDS organisations working in the neighbouring towns and farming areas and if none exist, its own wellness programme must extend to these areas. It must conduct regular voluntary HIV prevalence monitoring of the construction and operations workforce and ensure that its programme is responsive to the findings.
- Support partnerships that encourage a sense of community and that combat social ills, e.g. multipurpose community & skills development centres; networking points for new migrants; sports tournaments, social clubs, youth clubs, activities that promote women's empowerment that can lead to gender equality and community policing.

Emergency situation

- Shiloam must maintain appropriate fire control measures throughout the village area. Emergency procedures and contact numbers of neighbouring landowners and local Headmen Associations should be available for the site manager at all times.

8.7 Choice of Opuwo as the housing base

There is little doubt that most of the support services which the mine will need are already based in Opuwo. The main issue is whether Shiloam should make the choice of town for its housing base, on behalf of its future employees.

The choice of Opuwo as the housing base for the mine's operations will have a profound positive impact on the town for the life of mine. New housing will need to be built which will boost the town's housing stock and revenue collected from rates. The town is nearer to the more populated northern regions of Namibia and to Etosha. The town has plenty of groundwater.

By contrast, Opuwo can offer a range of housing stock, good government and private medical, education, many services and entertainment facilities. The town is growing and whether the mine is based there or not. Developers will not be hesitant to build housing stock in Opuwo but they will need commitment from Shiloam before they invest in Opuwo.

Shiloam's presence in Opuwo will not make a significant impact on the town but if it encourages many employees to be based in Opuwo, its impact will be measurable. To what extent this will be sustained after the mine closes is unclear. It took Tsumeb many years to recover from the mine closure.

Shiloam will be competing with other mines in Namibia to secure the best professional mining team. Their spouses are likely to be professionals who will also want to find rewarding employment and this is more likely to be secured in Opuwo than Opuwo. The likely scenario is that the aspiring middle and professional classes will want to live in Opuwo while some of the less skilled employees may prefer to live in Opuwo as housing may be cheaper.

Shiloam will therefore be expected to provide transport for employees who live in both towns. It should assess the housing stock in both towns and decide if it needs to be proactive and build accommodation.

8.8 Conclusions

The socio-economic impact assessment shows that negative impacts are likely to be overshadowed by the positive benefits. The project will create employment opportunities for 800 people during the construction phase and 454 people during the eleven year operations phase. Between 200 -300 of these jobs will be in the unskilled to low skilled grades of 1-3, which could be filled by provide skilled training and employment to many people in Kunene Region. A further 680 jobs may be created in the supply chain and through support services. Therefore, the project has great potential to improve livelihoods and make a contribution to sustainable development, in line with NDP4 and Vision 2030.

The multiplier effects of the mine are likely to be considerable. In-migration could be around 7 000 people who might move to Opuwo for employment, as entrepreneurs, in search of jobs or simply as camp followers.

Shiloam must work closely with both the Opuwo town councils to manage in-migration as it is the most serious negative impact which can create further unwanted impacts. Shiloam is urged to begin local selection and providing technical training as soon as possible to enable local people to compete for the lower skilled jobs.

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ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESSMENT REPORT

FOR THE PROPOSED COPPER MINING ACTIVITIES ON MINING LICENCE (ML 249) FOR
COPPER MINING ACTIVITIES LOCATED IN OMBARUNDU AREA IN THE KUNENE REGION,
NAMIBIA.

Compiled by:

Roland Mushi (Archaeologist)

Prepared for:

Shiloam Mining and Investments (Pty) Ltd

As required under Section 53 (7) and Section 54 (7) of the National Heritage Act (No. 27 of

2004).

Document Information/Project Details

Item	Description
Report Title	Archaeological and Heritage Impact Assessment Report for the ML 249 Located in Ombarundu in the Kunene Region, Namibia.
Project Location & Site name	The Mining Licence 249 is located 40 km northeast of Opuwo, along the C35 road in the Kunene Region-Namibia
Target Commodities	Base and Rare Metals, and Precious Metals.
Granted Date	Pending Renewal
Expiry Date	Pending Renewal
Central Coordinates	14°20'36.378"E 17°50'35.017"S
Corners Coordinates	<i>Refer to Table 1 below</i>
Purpose of the assessment	The purpose of study is to identify, record and recommend measures for mitigation in areas of the archaeological and cultural heritage significance, this include rock art sites, artifacts, graves or burial grounds features, paleontological, structures, buildings, landscape etc. that might be impacted by the proposed project.
Project Proponent/Developer	Shiloam Mining and Investments (Pty) Ltd Contact person: Betuel lileka lileka Po.Box 80081, Olimpia, Windhoek, Namibia. Telephone: +264 81 1500800
Size of application area (ML 249)	2938 hectares. (ha)
Field-survey and reporting writing	Roland Mushi (Archaeologist) Contacts : +264 85 3332373 Tel: +264 61 259530
Reviewer(s)	Mr. Nerson
Report Date	03/08/2022
Project #	

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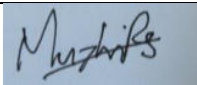
Authorship: This Archaeological and Heritage Impact Assessment Report has been prepared by Excel Dynamic Solutions (Pty) Ltd (EDS). This report is for the review of the National Heritage Council of Namibia in accordance with the National Heritage Act No. 27 of 2004.

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Disclaimer: The Author(s) is/are not responsible for omissions and inconsistencies that may result from information that may not be available at the time this report was prepared. This report may contain information of a specialized and/or highly technical nature and the client is advised to seek clarification on any elements which may be indistinct. Information and recommendations in this document should only be relied upon in the context of this document; any documents referenced explicitly herein should only be used within the context of the appointment.

The Archaeological and Heritage Impact Assessment 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 authorization of exploration prospective for Shiloam Mining and Investments (Pty) Ltd.

Declaration of Independence

Specialist Name/Archaeologist	Roland Mushi Contacts: +264 85 3332373 Telephone: +264 61 259530
Declaration of Independence	I, Roland Mushi, as an employee of Excel Dynamic Solution (Pty) Ltd, hereby confirm my independence as a Archaeologist/Heritage specialist and declare that I/we have no interest in the business of our client, other than fair remuneration for work performed on this project/contract as well as the execution of archaeological sound fieldwork and the submission of a professional report to our client and Body of Authority (National Heritage Council).
Signature	
Date	10/08/2022

Expertise of the Specialist

Roland Mushi has several years of experience of working in the desert environments more specifically in Namib Naukluft National Park as a Researcher, and most recent he has been working as a full-time archaeologist for Excel Dynamic Solutions (Pty) Ltd since 2021. Academically, he obtained an **MSc in Natural Resources Assessment and Management**, and **B.A (Hons) in History and Archaeology** with special focus and interest on Lithic and Fauna Analysis in Archaeology, both degrees were obtained from the University of Dar Es Salaam. Roland is an accredited member of the following;

- **ASAPA** - Association of Southern African Professional Archaeologists # 480
- **SAfA** - Society of Africanist Archaeologists
- **SAMA** - South African Museums Association # NCM 008
- **MAN** - Museums Association of Namibia
- **EAPAN** - Environmental Assessment Professionals Association of Namibia # 179

Executive summary

This report has assessed the archaeological and heritage implications of the proposed ML No. 249 which is located approximately 40 km (horizontal distance) North-East of Opuwo Town, in the Kunene Region. This study was conducted as part of the specialist input for the Environmental Application process i.e. Environmental Clearance Certificate (ECC) and thus, which will serve to inform the Environmental Scoping Assessment Report (ESA) and Environmental Management Plan (EMP) for the proposed prospecting and exploration of Base and Rare Metals, Dimension Stones, Industrial Minerals, Non-Nuclear Fuel Minerals and Precious Metals on ML No. 249.

A site survey was carried out on 28th of June, 2022 to assess the likely impact of the proposed mining activities on the potential archaeological and heritage resources in the area, and to inspect the subject lands for any trace of visible archaeological sites including artifacts and cultural material objects. However, the site inspection did not observe or locate any of the significant archaeological or cultural places in the surveyed subject lands. A number of mitigation measures including Chance Find Procedures are recommended in this report in order to prevent any accidental loss or damage to the yet to be uncovered archaeological finds or features that lie below the present surface and have no visible surface traces. In summary, the site survey did not locate any archaeological site, artifacts nor significance heritage resources.

Archaeological site: No known archaeological site observed or recorded during the site survey

Grave sites: No known visible grave sites recorded or were observed within the surveyed areas of the ML 249.

Stone artifacts: Few of the stone tools were recorded within the subject land. These few scatters are *isolated find* in archaeological perspective since they were very few and diagnostically they fit within MSA and LSA periods in archaeology (*refer to figures 9, 10 & 11*).

Historical sites: There was no recorded historical sites within the subject land and neither in the immediate areas. All the known historical sites which are of national monuments status are situated in Kamanjab town, Khorixas and Outjo (*Table 12*).

Heritage sites and the Built Environment: The site survey did not locate any of the known heritage site neither built environment within the subject land of the ML, the large part of this landscape where the proposed project will take place is covered by vegetation such as mopane trees, shrubs, grasses and primarily a rocky surface of calcrete rocks and outcrops.

Generally, it is the Author's considered opinion that, the overall impact of the proposed project on archaeology and heritage resources is expected to be low, nevertheless the Proponent is cautioned on how to properly protect and preserve the archaeological and heritage resources of the area. The Project Proponent should however be made aware of the provisions of the National Heritage Act of 2004 regarding the prompt reporting of archaeological finds including the adoption of "*Chance Find Procedures*". And thus, it is recommended that the proposed project can commence but subject to the conditions that the recommended mitigation measures herein (*Section 14.2*), and Chance find are implemented as part of the EMP and based on approval from the Authority. The recommended mitigations contained herein are for Archaeological and Heritage Impact Assessment, nonetheless authorization apply and the project may only proceed based on the review and ultimately the approval from National Heritage Council of Namibia.

Document information

The contents of this Heritage Assessment Report is according to the compliance with National Heritage Act, No. 27 of 2004 and the Guidelines for Heritage Impact Assessment in Namibia.

This Specialist Report prepared in terms of the NHC Guidelines, and contains the followings;	Addressed in the Specialist Report
<p>A. Title Page:</p> <ul style="list-style-type: none"> - Title of the report, Subheading: Property name and portion (where applicable), Area, Region; - Type of development; - Author of the HIA; - - Name of Proponent, - Consultant and Date of the HIA. <p>Details of-</p> <ul style="list-style-type: none"> - the specialist who prepared the report; and - the expertise of that specialist to compile a specialist report including a curriculum vitae and relevant documents 	<p>Page i & ii (Preliminary Section of this report) Page iv (Preliminary Section of this report)</p>
<p>B. Executive Summary:</p> <ul style="list-style-type: none"> - The purpose of the study; - Brief methodology including desktop study - Findings: Brief description of heritage resources, Significance of the resources and potential impacts and; Recommendations and reasoned opinions made by the heritage consultant. 	<p>Page v & vi (Preliminary Section of this report)</p>
<p>C. Declaration of Independence and CV:</p> <ul style="list-style-type: none"> - Heritage consultants must provide a very brief summary of their experience, - Qualifications, - Membership affiliations and membership numbers, and accreditation level if relevant, - A detailed CV and certified copies of degree certificates and ID must be attached in the Appendix); - - Heritage consultants must declare (and sign) their independence from the developer. 	<p>Page iv (Preliminary Section of this report)</p> <p>Appendix 3 & 4</p>
<p>D. Contents Page:</p> <ul style="list-style-type: none"> - List of acronyms used in the report and glossary. 	<p>Page xiii & xiv (Preliminary Section of this report)</p>
<p>E. Introduction and Terms of Reference:</p> <ul style="list-style-type: none"> - Introduction to the development project and background information; - Detailed terms of reference as provided to the heritage consultant from the commissioning body 	<p>Section 1 & 1.1</p> <p>Section 1.2</p>
<p>F. Project Description:</p> <ul style="list-style-type: none"> - General project area and the specifics of the development i.e. Size of farm and portions, 	<p>Section 2</p>

Magisterial District, location, aerial or geographic map and co-ordinates of the project development;	
G. Legislation Requirement - A summary of which legislation (including the relevant NHA sections) and other local by-laws triggered by the proposed development, and those identified must be subsequently outlined and quoted;	Section 3
- An indication of the scope of, and the purpose for which, the report was prepared;	Section 4
- A description of any assumptions, limitation made and any gaps in knowledge;	Section 5
H. Methodology - A description of the methodology used in undertaking a field survey including site investigation, and preparation of the report	Section 6 (including photographs, weather condition of the study area during the site visit)
I. Consultation and Stakeholder Engagement - A description of the result of consultation undertaken during the site visit (Relevant to heritage resources only) - Any abridged copies received	Section 8.1 N/A
Literature reviews - Brief summary of reports used - Description of the Study Area/topography - Geology of the project area	Section 9, 9.1.1 & 9.1.2 Table 10
J. Detailed Assessments - Site investigation details	Section 7, Table 5
K. Site Description	Section 9.1, Section 11
L. Site Significance Rating	Section 8, Section 12.1
(i) Background and general Heritage Context of the area - Desktop Study	Section 10, 10.1
(ii) Physical and Environmental Context of the area - Vegetation and Landscape - Site context	Section 11 & 11.1
(iii) Findings of the Heritage/Historical sites - Lists of built environment recorded	Section 12 & 12.1,
(iv) Potential Impacts on Cultural Heritage resources - Archaeological, historical, built environment and cultural	Section 13, 13.2, 13.2, 13.3 & 13.4
(v) Tabulated summary of the Impact evaluation of the proposed project	Section 13.5, Table 16, 17 & 18
(vi) Tabulated summary of heritage resources and vulnerability description	Section 13.5, Table 19
(vii) An identification of any areas to be avoided, including buffers;	n/a

- A superimposed mapped of the built environment and structures on the sensitivities areas of the site to be avoided, including 1.5 km buffer zones;	
(viii) Identification of alternatives	Section 13.6
(ix) Anticipated Impacts on Heritage Resources	Section 13.7
(x) Residual Cumulative Environmental Effects	Section 13.8
M. Management Plan and Mitigation measures - Any mitigation measures for inclusion in the proposed project EMP - Conclusion and Recommendation Statement and reasoned opinion of the specialist - whether the proposed project should be authorized or not;	Section 14 Section 14.1, 14.2 Section 14.3
N. References	Section 15
M. Appendices - Any archaeological and heritage monitoring requirements for inclusion in the EMP or Environmental Authorisation; - Any archaeological and heritage management plan - Built environment and structures with historical significance - Site notices and Participants	Appendix 1 Appendix 2 Appendix 3 Appendix 4

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Glossary list used in this report

Abbreviation	Description
AHIA	Archaeological and Heritage Impact Assessment
AMP	Archaeological Management Plan
AD	Anno Domini
ASAPA	Association of Southern African Professional Archaeologist
CFP	Chance Find Procedure
EAPAN	Environmental Assessment Professionals Association of Namibia
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment*
EIA	Early Iron Age*
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
ESA	Early Stone Age
GIS	Geographical Information System
NHC	National Heritage Council
MAN	Museum Association of Namibia
MIA	Middle Iron Age
MSA	Middle Stone Age
LIA	Late Iron Age
LSA	Late Stone Age
PM	Project Manager
SM/I	Site Manager/Inspector
SAfA	Society of Africanist Archaeologists
SAMA	South African Museums Association

Definitions of Key Terms

Archaeological: in relation to a place or an object, means (a) any remains of human habitation or occupation that are 50 or more years old found on or beneath the surface on land or in the sea; (b) rock art, being any form of painting, engraving or other representation on a fixed rock surface or loose rock or stone which is 50 or more years old;

Archaeological site (means an area in which archaeological objects are situated)

An artifact or artefact: is a general term for an item made or given shape by human culture, such as a tool or a work of art, especially an object of archaeological interest.

Built environment: The built environment includes an array of historic buildings, structures and objects, from missions, forts and rock walls to entire town sites and settlements.

Monuments: Architectural works, works of monumental sculpture and paintings, elements or structures of an archaeological nature, inscriptions, cave dwellings and combinations of features, which are of outstanding universal value from the point of view of history, art or science;

Heritage significance: means aesthetic, archaeological, architectural, cultural, historical, scientific or social significance;

Historic building (refers to structure or building which is over 50 years or more)

Chance Finds: means Archaeological artefacts, features, structures or historical cultural remains such as human burials that are found accidentally in context previously not identified during cultural heritage scoping, screening and assessment studies. Such finds are usually found during earth moving activities.

ESA: >2 600 000 years ago – 250 000/200 000 years ago

MSA: 250 000/200 000 years ago – 40/25 000 years ago

LSA: 25 000 years ago – AD 200 (up to historic times in certain areas)

Iron Age Periods: AD 200 – AD 1840

Historic: AD 1840 - 1950

1. Introduction

1.1. Background Information

Excel Dynamic Solutions (Pty) Ltd (*herein referred to as Independent Consultant*) was appointed by Impala Environmental Consultants on behalf of Shiloam Mining and Investments (Pty) Ltd (*hereinafter referred to as The Proponents*) to conduct an assessment of the potential impacts to archaeological and heritage resources that might occur through the proposed project within the Mining Licence (ML) 249 which is located about 40 km northeast of Opuwo, along the C35 road in the Kunene Region. (*Figure 1*). The targeted commodities of this Mining Licence are Base and Rare Metals which is copper, and Precious Metals.

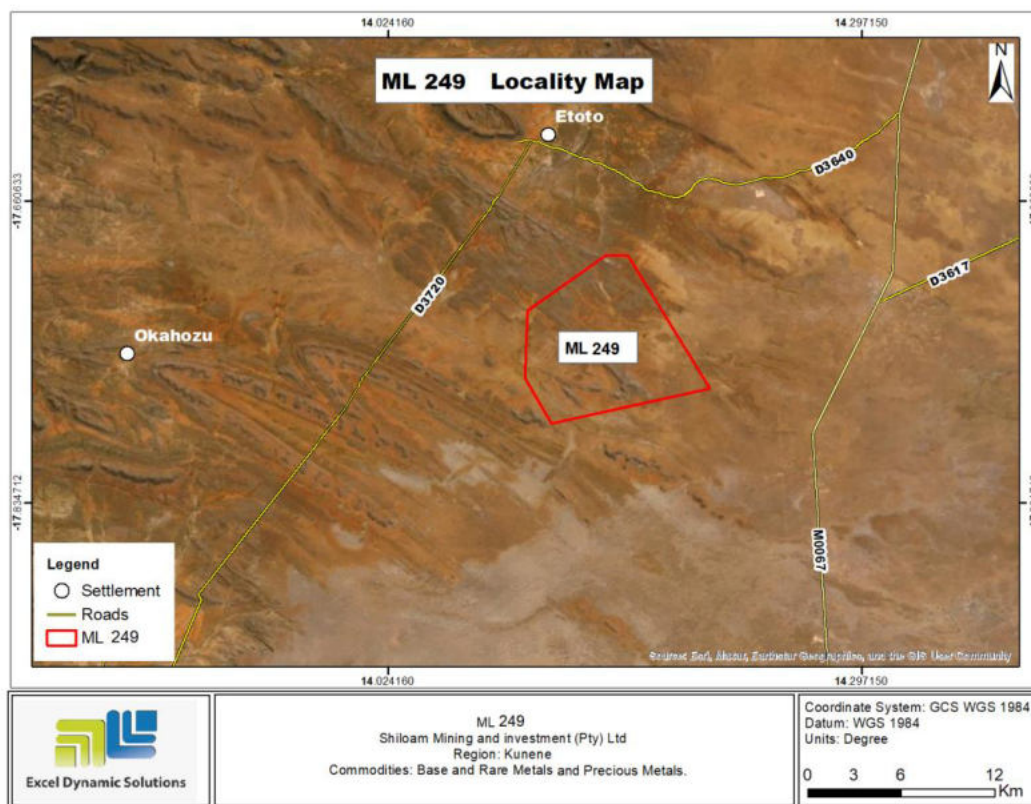


Figure 1: Locality map of the ML 249

The archaeological focus of this study is based on the coverage and extent of the Mining Licence 249 that covers the land of which the ML 249 falls as shown in (*Figure 2*). The approximate coordinates of ML 249 are provided in *Table 1*. In nutshell, this archaeological and heritage impact assessment is not limited to the identification of archaeological artefacts, historical buildings and

graves only. It is far more encompassing and includes intangible and invisible resources such as places, oral traditions and rituals.

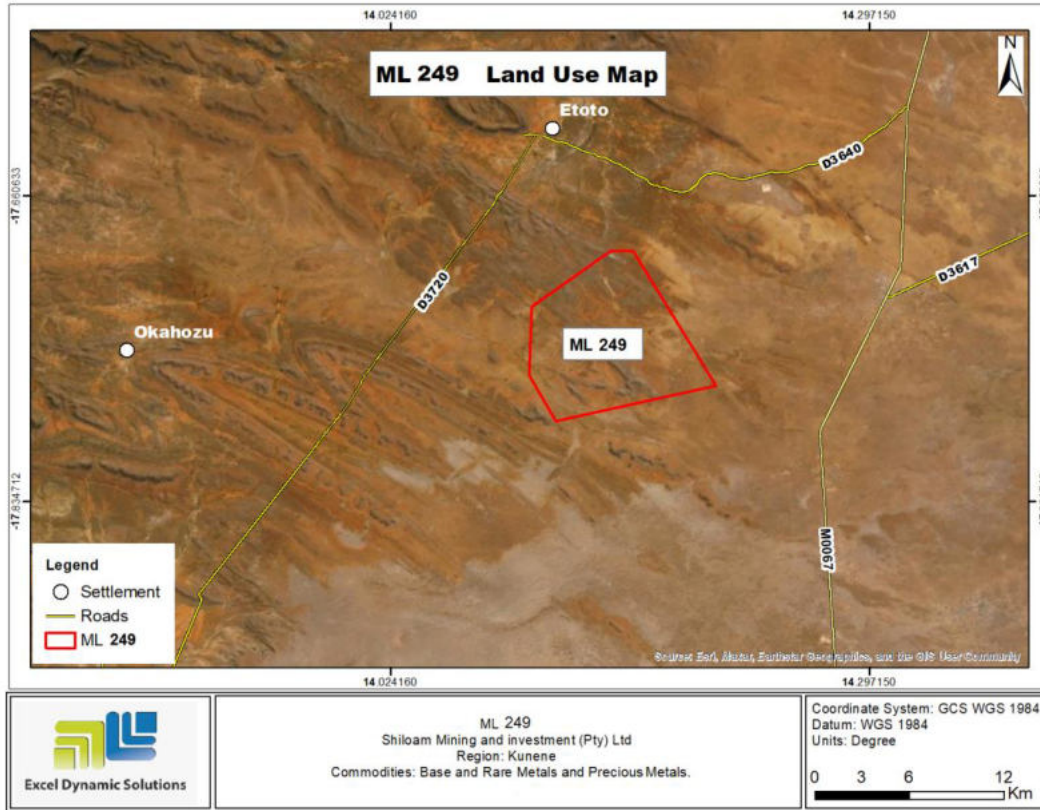


Figure 2: Land use within the ML 249.

1.1.1. The Proposed Project boundaries are located at the following GPS Coordinates

Table 1: Approximate GPS coordinates Corners/boundaries of the ML 249

Geographic Positioning System Points			Total Area
Corners	Latitude	Longitude	2938 hectares
Point A	-17.842945	14.299193	
Point B	-17.818003	14.348471	
Point C	-17.834168	14.372662	
Point D	-17.846585	14.380416	
Point E	-17.859180	14.366832	
Point F	-17.863237	14.352848	

The Proponent intends to adopt various techniques for mining the targeted commodities such as the use of (Reverse Circulation and Erection of Primary Crushing Unit (grinding and sizing). This will involve blasting and grinding equipment are to be used to accomplish the task. Also, open pit mining is a technique will be used to extract copper ore near the earth's surface. Open pit mining is the most widely used technique of mining copper today. It is accomplished by creating and using benches or terraces to gradually reach deeper under the earth's surface. Open pit mining is defined as the method of extracting any near surface ore deposit using one or more horizontal benches to extract the ore while dumping overburden and tailings (waste) at a specified disposal site outside the final pit boundary. Therefore, it is against this background that a detailed site survey was carried out.

Therefore, the principal aim of the study is to survey the area of study, to identify archaeological, cultural and heritage sites, document them, and assess their importance within local, regional and national context. It serves to assess the impact of the proposed project on non-renewable heritage resources, and to submit appropriate recommendations with regard to the responsible cultural resources management measures that might be required to assist the Project Proponent in managing the discovered and yet to be discovered heritage resources in a responsible manner. It is also conducted to protect, preserve, and develop such resources within the framework provided by the National Heritage Act of 2004 (Act No. 27 of 2004). This report outlines the approach and methodology used before and during the survey, which includes: Phase 1, review of relevant literature; Phase 2, consultation and the physical surveying of the area on foot and by vehicle; Phase 3, reporting the outcome of the study.

In accordance to the existing Namibian relevant Acts, this report has therefore been compiled to complement the Environmental Scoping Assessment (ESA) Report and to be submitted to the National Heritage Council of Namibia as requirement and condition of the issuance of a Consent Letter. The Consent Letter will need to be submitted to the Environmental Commissioner to make an informed decision on the issuance of the Environmental Clearance Certificate (ECC) for the proposed project.

1.2. Terms of Reference

Excel Dynamic Solutions (Pty) Ltd was contracted by Impala Environmental Consultants on behalf of Shiloam Mining and Investments (Pty) Ltd (*hereinafter referred to as The Proponent*), to undertake Archaeological & Heritage Impact Assessment (AHIA) for the proposed mineral exploration project. The primary task of the archaeological assessment reported here is to (a) locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest, (b) record coordinate points (GPS) of identified areas as significant, (c) determine the levels of significance of the various types of heritage resources that might be affected by the proposed project, and (d) suggest appropriate management and mitigation measures for the archaeological and cultural heritage resources that might occur in the area proposed for exploration works which can be potentially destroyed in the course of prospecting and detailed exploration.

2. Project Description

Shiloam Mining and Investments (Pty) Ltd (*hereinafter referred to as The Proponent*), is in ownership/pending renewal of Mining License (ML) No. 249 for the mining of Base and Rare Metals and Precious Metals. Therefore, Archaeological Impact Assessment is to be conducted by Excel Dynamic Solutions (Pty) Ltd to identify the possible impacts on the archaeological or heritage resources on the site. Project components and the location is outlined under **Table 2** and **3** below.

Table 2: Project Area

Project Area	The mining licence is located 40 km northeast of Opuwo, along the C35 road in the Kunene Region.
Magisterial District/Location	Opuwo Constituency
Central co-ordinate of the development	14° 20' 36.378" E and 17° 50' 35.017" S.
Topographic Map Number	N/A

Table 3: Infrastructure and project activities

Types of Development	Mining activities of Base rare and Precious metals
Size of the ML	The size of the mining licence is 7647 hectares.
Project Components	The proposed activities will entail the mining activities for targeted commodities which are economically feasible. The detailed mining techniques and methods to be used will be presented in the full ESA Report.
Proposed Development	Construction of on-site accommodation structures (include <i>tented camps</i>), and access roads (<i>if necessary</i>) within the Mining Licence.

Site Clearance	Small land parcels will be cleared for the establishment of base or field camps and staging areas. Field camps are for the safe keeping of the mining equipments and vehicles.
Phases of the Proposed Project/Development	This proposed project will have two phases; (i) Construction phase and, (ii) Operational phase. It should be noted that, construction will involve activities such as land clearance, making access roads, bringing in machineries for mining works, setting up accommodation structures for on-site workers etc. The operational phase will involve the actual mining activities including processing etc.
Construction camps	Construction of camps will largely depend on the outcome initial site visits to identify appropriate places. The workforce will include skilled, semi and unskilled workers mostly from the nearby communities as well as in Opuwo, as necessary to complete the works. More than 55 people will be employed for the first phase of the project.
Site Access	The access roads to the mining site are quite good. The mining claim sites will be accessed using farm roads that lead from the B1 main road.
Temporary roads	Creation of access routes and haul tracks: Apart from the existing road network leading to target areas, additional tracks (extensions from the existing access roads) may be created. Additional tracks may be considered for accessing target sites.
Expected impacts	<p>+ ve impacts include</p> <ul style="list-style-type: none"> • Employment opportunities, boosting local economy, infrastructural related development, investment opportunities, skills transfer, Improved geological understanding of the area, increased support for local business. <p>-ve impacts include</p> <ul style="list-style-type: none"> • Physical land and soil disturbance, destruction of archaeological/cultural materials through unintentional uncovering of the unknown archaeological materials and objects, environmental pollution, disturbance on local habitat (flora and fauna), potential social nuisance i.e. conflict between farmers/landowners and Proponent due to lack of communication etc.

3. Legislative context

This chapter outlines the regulatory framework applicable to the proposed project. **Table 4** provides a brief list of applicable legislation and relevance to the project.

This HIA report is a component of a broader Environmental Impact Assessment (EIA) / Scoping Assessment (ESA) study and addresses the requirements of the NHA Act 27 of 2004 and National Heritage Regulations (Government Notice 106 of 2005, in line with EIA Terms of Reference, and

with reference to the assessment of impacts of the proposed development on the archaeological, cultural and heritage resources associated with the receiving environment.

In principle, the National Heritage Act, 2004 (Act No. 27 of 2004) provides for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Special provision is given for protection and management of certain heritage resources in Namibia, these are listed in **Part VI from paragraph (53-58)** including listed buildings which are 50 years old or more than that, archaeological object or paleontological interest in existence which is 50 years or more years old, meteorite, historic shipwrecks and shipwreck objects (Underwater heritage) this include the remains of all ships that have been situated on the coast or in the territorial waters or the contiguous zone of Namibia for 35 years or more are historic shipwrecks for the purposes of this section, and other heritage resources.

Part I, Section 1 paragraph (a) and (b) defines "archaeological" in relation to a place or an object, means (a) any remains of human habitation or occupation that are 50 or more years old found on or beneath the surface on land or in the sea; and (b) rock art, being any form of painting, engraving or other representation on a fixed rock surface or loose rock or stone which is 50 or more years old. While **Part V Section 46** of the Act prohibits removal, damage, alteration or excavation of heritage Sites or remains. **Section 48** sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development.

Furthermore, **Section 51 (3)** sets out the requirements for impact assessment. **Part VI Section 55 Paragraphs (3) and (4)** require that any person who discovers an archaeological site should immediately notify the National Heritage Council.

Table 4: Brief summary of the relevant Act(s) and Ordinance

National Regulatory	Summary	Applicability to the Project
National Heritage Act, No. 27 of 2004.	<p>The Act makes provision for the protection and conservation of places and objects with heritage significance</p> <p>Section 55 compels exploration/mining companies to report any archaeological findings to the National Heritage Council after which a permit needs to be issued before the find can be disturbed.</p>	<p>There is potential for heritage objects to be found during the exploration activities and operations, therefore the Stipulations in the Act have been taken into consideration and are incorporated into this A/HIA report and the overall project EMP.</p> <p>The project shall be compliant with section 55.</p>

<p>National Monuments Act of Namibia (No. 28 of 1969) as amended until 1979</p>	<p>No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia: Meteorites, fossils, petroglyphs, ornamental infrastructure graves, caves, rock shelters, middens, shells that came into existence before the year 1900 AD: or Any other archaeological or paleontological finds.</p>	<p>The proposed site of development is not within any known monument sites, both movable and immovable as specified in the Act, however in finding any materials specified in the Act, contractors and exploration crews on-site will take the required and necessary route and notify the relevant Authority.</p>
<p>Burial Place Ordinance, Act No. 27 of 1966.</p>	<p>To prohibit the desecration or disturbance of graves in burial places and to regulate matters relating to the removal or disposal of dead bodies.</p> <p>The Municipal Ordinance 13 of 1963 has been replaced by the Local Authorities Act 23 of 1992. (3) No person shall, except with the permission of the Administrator, in any way disturb, damage, remove or destroy a grave, monument, gravestone, cross, inscription, rail, enclosure, chain or erection of any kind whatever, or part thereof in any burial place.</p>	<p>Since graves can occur anywhere within the landscape, therefore this Act is relevant for this particular project, and it should be taken into consideration by the Project Proponent when undertaking the construction and mining works.</p>
<p>Environmental Management Act (7 of 2007) Government Notice 232 27th December 2007</p>	<p>PART I: The definition of the environment employed by the Environmental Management Act (7 of 2007) specifically includes “anthropogenic factors” such as archaeological remains or any other evidence of human activity.</p> <p>PART II: Environmental impact assessment (EIA) in Namibia is governed by this legislation and usually includes a specialist archaeological survey and assessment, following the stated Principles of</p>	<p>Archaeological materials, heritage resources, historical, cultural landscape or topographical settings is part of the environment in its context, hence this Act is very relevant to the proposed project and the Proponent is henceforth mandated to take into consideration all the necessary steps so as not to affect or destroy the environment where heritage resources are found.</p>

	Environmental Management which require that Namibia's cultural...heritage...must be protected and respected for the benefit of present and future generations.	
Environmental Assessment Policy of Namibia 1995	The policy seeks to ensure that environmental consequences of development projects and policies are considered, understood and incorporated into planning process, and the term environment is broadly interpreted to include biophysical, political, economic, social aspects, traditional norms, cultural and historical components.	This Archaeological and Heritage Assessment study considers the term ENVIRONMENT to be part and parcel of archaeological and cultural heritage in its contexts.

4. Scope of the Study and Objective of the Report

This Archaeological & Heritage Impact Assessment (AHIA) aims at identifying any significant heritage resources before any development begins so that these can be managed in such a way as to allow the development to proceed without undue impacts to the heritage resources of a particular area. Also, this report aims to fulfil the requirements of the Heritage Authorities of Namibia who will review the AHIA and grant or refuse authorisation. Similarly, the report will inform the EIA in the development of a comprehensive EMP to assist the project applicant/Proponent in responsibly managing the identified heritage resources in order to protect, preserve, and develop them within the framework provided by the National Heritage Council Act (Act No 27 of 2004). And thus, the AHIA report will outline any management and mitigation requirements that will need to be complied with from a heritage point of view and that should be included in the conditions of authorisation should this be granted.

5. Assumptions, Limitations and knowledge gaps

The archaeological and heritage study reported herein was carried out at the surface levels only and hence any completely buried archaeological sites could not be readily located. Similarly, it is not always possible to determine the depth of archaeological material visible at the surface. Based on this assumption, the possibility of discovery or unearthed of heritage resources during the clearing of vegetation, exploration or construction phase cannot be excluded. However, this limitation can be successfully mitigated with the implementation of a chance find procedure as

recommended throughout the report. As with mitigation measures recommended in this report, (See **Appendix 1 & 2** below for *Chance Finds Procedure (CFP)* in accordance with the *National Heritage Council*) are outlined by the National Heritage Council. In addition to that, the Author of this report has prepared an Archaeological Heritage Monitoring Plan.

6. Approach and Methodology

6.1. Literature Review

A brief survey of available literatures was conducted to extract data and information on the area in question to provide general heritage context into which the development would be set. This literature search included published material, unpublished reports including EIA reports and online material from various websites.

6.2. GIS Spatial analysis

Google Earth and topographic maps of the area were utilised to identify geologic, topographic, elevation of the area, and possible places where sites of heritage significance might be located. The GIS spatial database was utilised to collect any useful information on any the above mentioned in the area, as well as for georeferencing purposes.

6.3. Public Consultation and Advertisements

Public notice of the project was advertised in two local newspapers for two consecutive weeks (**Table 5**). The public and all stakeholders were invited to register as I/APs, to comment and raise their concerns about the project (for the purposes of this AHIA report only archaeological and heritage related issues will be included. The traditional authority has been engaged and are in the process of issuing a consent letter for the project.

Table 5: Placement of Newspaper adverts

Newspaper	Date of placement
New Era	
New Era	
Windhoek Observer	
Windhoek Observer	

6.4. Site Investigation

The aim of the site visit was to; (a) survey the proposed project area to locate, identify, record, photograph and describe sites of archaeological, historical or cultural interest (*if any*); (b) record

GPS points of sites/areas identified as significant areas; (c) determine the levels of significance, grading of the various types of heritage resources recorded in the project area. **Table 6** below highlights the situation during the field-survey on the study area ML 249.

7. Detailed Assessment

Table 6: Site Investigation Details

General Site Investigation	
Date	The site was visited on 28 th of June 2022
Season/Weather condition and site visibility	Clear sky and Sunny day – The site of which ML 249 falls is within communal land. The terrain and ground visibility was difficult, the area is densely vegetated covered with dense grasses (Bush man grasses and <i>Stipagrostic spp</i> , mopane trees, and other vegetation. Some areas were impassable. Generally, there was no significant findings in these areas that are of HIGH archaeological value within the ML 249.
Direction of the ML/Site	The ML is accessible via C35 roads.
Details of equipment used in the survey (GPS)	All readings and site positions was determined in the field by hand-held Garmin etrex 30x GPS (Accuracy levels is ± 3 meters)
Details of equipment used in the survey (Camera)	Photographs were taken using a Digital Camera: Huawei Y6P.



Figure 3: The access road toward the ML 249.

8. Site Significance Rating:

The presence and distribution of historical, cultural or heritage resources define a 'heritage or cultural landscape' of an area. In this particular landscape, every site is relevant, and because heritage resources are non-renewable, heritage surveys needed to investigate the proposed project area, or a representative sample, depending on the nature of the project. In the case of the proposed project the local extent of its impact necessitates a representative sample and only the footprint of the areas demarcated for development were surveyed. In all the initial investigations and surface survey, however, the undersigned (Archaeologist/specialist) is responsible only for the identification of resources visible on the surface. The grading and level of significance of the identified heritage resources on ML 249 are given in the following pages on *Section 12.1, Table 15.*

Table 7: Grading of Heritage Significance and Field Rating

Level of significance	Grading	Description
Exceptional/upper higher	5	<ul style="list-style-type: none"> Major national heritage resources A rare and outstanding example Containing unique evidence of high regional and national significances
Considerably high	4	<ul style="list-style-type: none"> Very important to the heritage of the region A high degree of integrity/authenticity Multi-component site and objects High research potential
Moderate	3	<ul style="list-style-type: none"> Contributes to the heritage of the locality and region Have some altered or modified elements, not necessarily detracting from the overall significance of the place Forming part of an identifiable local distribution or group Research potential
Low	2	<ul style="list-style-type: none"> Isolated minor find in undisturbed primary context, with diagnostic materials Makes some contribution to the heritage of the locality, usually in combination with similar places or objects

Little	1	<ul style="list-style-type: none"> • Makes a little contribution to the heritage resources of the locality • Heritage resources in a disturbed or secondary context, without diagnostic or associated heritage
Zero/ no significance	0	<ul style="list-style-type: none"> • Absence of heritage resources • Highly disturbed or secondary context, without diagnostic or associated heritage

Impact Assessment Methodology as developed by QRS Namibia

This Archaeological and Heritage Impact Assessment followed a two-based process of assessment; desktop and field based assessments. The criteria below are used to establish the impact rating on sites based on the findings. These are recognized by the International Council on Monuments and Sites (ICOMOS), as well as those formulated by the Quaternary Research Services (QRS) in Namibia by Kinahan (2012). The methodologies were adopted in line with the standards for environmental assessment and the protocol developed for archaeological heritage assessment in Namibia that reflect Namibian conditions and are accepted as a basis of evaluation by the National Heritage Council. In order to establish the heritage significance of the resources, and their vulnerability to possible disturbance in the course of prospecting and exploration (now and in the future), the assessment criteria below developed by QRS (Kinahan, 2012) established parallel 0-5 scales, as summarized in (Tables 8-10) below.

Table 8: Archaeological Significance and Vulnerability Rankings (Kinahan, 2012)

Scale	Significance Ranking	Scale	Vulnerability Ranking
0	no significance	0	Not vulnerable
1	Disturbed or secondary context, without diagnostic material	1	No threat posed by current or proposed development activities
2	Isolated minor find in undisturbed primary context, with diagnostic material	2	low or indirect threat from possible consequences of development (e.g. soil erosion)
3	Archaeological site (s) forming part of an identifiable local distribution or group	3	Probable threat from inadvertent disturbance due to proximity of development
4	Multi-component site (s), or central site (s) with high research potential	4	High likelihood of partial disturbance or destruction due to close proximity of development
5	Major archaeological site (s) containing unique evidence of high regional significances	5	Direct and certain threat of major disturbance or destruction

Table 9: Assessment criteria for the evaluation of cumulative impacts on archaeological sites devised by the QRN.

Criteria	Category	Description
Extent or spatial influence of impact	National Regional Local	Within Namibia Within the Region On site or within 200 m of the impact site impact
Magnitude of impact (at the indicated spatial scale)	High Medium Low Very Low Zero	Social and/or natural functions and/ or processes are severely altered Social and/or natural functions and/ or processes are notably altered Social and/or natural functions and/ or processes are slightly altered 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 Medium Term Long Term	Up to 3 years 4 to 10 years after construction More than 10 years after construction

Table 10: Reversibility Ratings Criteria

Reversibility Ratings	Criteria
Irreversible	The activity will lead to an impact that is permanent.
Reversible	The impact is reversible, within a period of 10 years

8.1. Results of Public Consultation and Stakeholder Engagement

The consultants did engage the Traditional Authority but there was no archaeological issue raised or any relevant information that is archaeologically significance within the subject lands.

9. Literature survey/ Background Study

A survey of available literatures was carried out to assess the archaeological and heritage context into which the proposed project would be set (*Table 11*). Maps of the area were used to identify the geologic, topographic, landscape and elevation of the proposed project area. Archaeological, historical and heritage sites are identified by the use of Garmin GPS and photographs taken during the surface survey. The sites recorded consist mostly of stone artifacts, graves and the general features on landscape.

Table 11: Some of the reports consulted for Archaeological and Heritage sites

Author	Year	Project	Findings
MacCalman	1972	late Pleistocene	Evidence of late Pleistocene evidence from Kunene Region
MacCalman and Grobbelaar	1965	late Pleistocene evidence from the area sequence in Namibia	Observations on stone tool use by contemporary hunter-gatherer groups

9.1. Description of the Study Area

9.1.1. Topography and Landscape of the Project area

Topographically, the Landscape in the Kunene Region is divided into the interior highlands and the pro-Namib plains. It has six agro-ecological zones namely the Mountainous areas, Plateaus, Riverine, Lacustrine and Karst areas, Coastal desert and Etosha region. Soils in the landscape area are generally characterised by low organic matter content and a deficit of Phosphorus. Their depth varies from shallow to deep and can predominantly be described as sandy to loamy sand. To the west, soils are marginal and consist of a thin layer of soil, strewed with stones and are of no arable value. The most northern parts of Kunene are largely mountainous, without easy road access.

9.1.2. Geology of the Project area

The subject land is situated in the rugged Kunene Hills landscape (cf. Mendelsohn et al. 2002), characterized by areas of prominent outcrop interspersed with chromic cambiosols derived by weathering of the prevailing rock types. The Kaoko Belt consists of four structural zones. From

east to west they are the Eastern Kaoko Zone (EKZ), the Central Kaoko Zone (CKZ), the Western Kaoko Zone (WKZ) and the Southern Kaoko Zone (SKZ). The two groups most important to mineralization on the property are the Nosib Group and the overlying Ombombo Group. The Damara Supergroup commences with the Nosib Group, a package of (meta-) sandstones, conglomerates and siltstones that has been informally subdivided into lowermost conglomeratesandstone, middle siltstone-dominant, and uppermost sandstone-conglomerate sequences. The total thickness ranges to more than 1,000 metres. The Nosib Group comprises a series of prominent exposures of feldspathic quartzite to arkose, conglomerate, and shale, commonly expressed as elongate to rounded hills with a strong potassium (“K”) channel radiometric signature. The Nosib Group unconformably overlies the basement to the north and south and is commonly preserved as open synclines or monoclines (Miller, 1992).

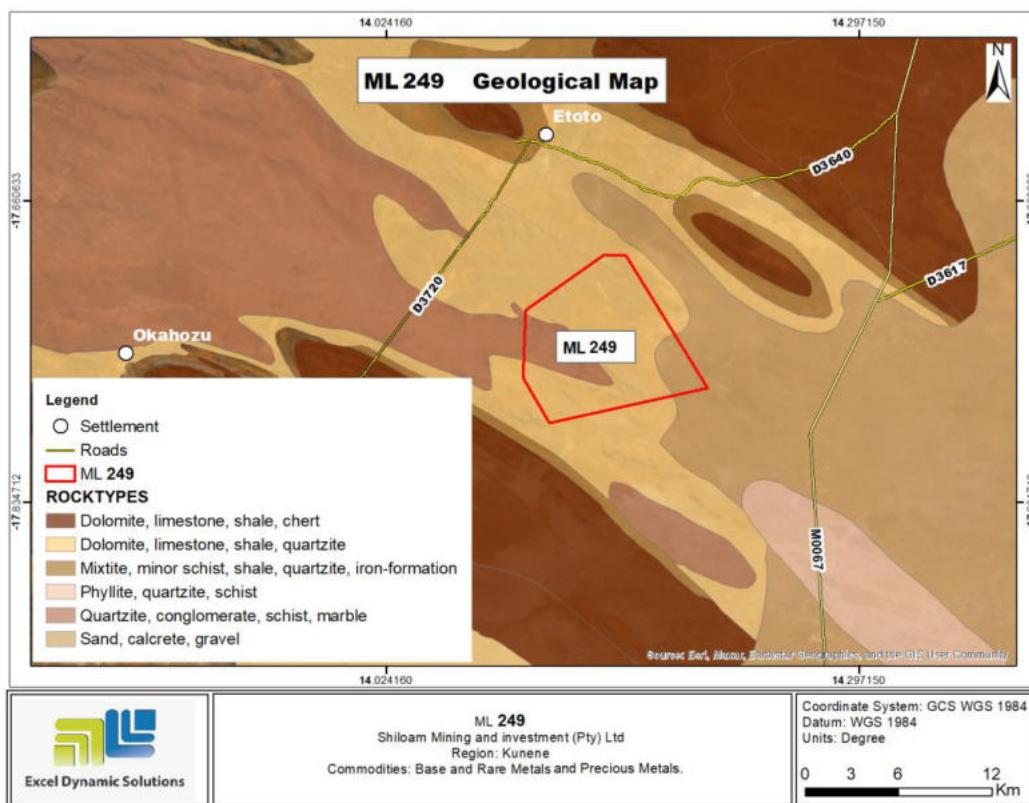


Figure 4: A Geological map of the location of ML 249

10. Background and general Heritage Context of the area

10.1. Regional Archaeological and Heritage Context

The archaeological evidence available so far indicates that the Kunene Region will have abundant traces of Pleistocene occupation but that much of this evidence will have been displaced by sheet erosion on high angle slopes. Holocene age material is also present in the region, including some examples of rock art in the form of engravings on outcrops near the Epupa Falls (Sherz, 1975) and in the adjacent parts of southern Angola (Kinahan, 1997).

Early investigations by MacCalman (1972) and MacCalman and Grobbelaar (1965), drew attention to the presence of late Pleistocene evidence from the area, and more spectacularly, observations on stone tool use by contemporary hunter-gatherer groups. More recent investigations have documented a late Holocene occupation sequence (Albrecht et al, 2001) and some of the detailed archaeological characteristics of nomadic pastoral settlement patterns in the area (Kinahan, 2001).

These investigations can only be described as preliminary, but they have indicated something of the area's archaeological potential, particularly with respect to the history of the OvaHimba, the last remaining traditional pastoralist society in southern Africa. The interest of the OvaHimba archaeology lies partly in the history of the people themselves, and partly in the comparative value of such archaeological evidence for the understanding of pre-colonial pastoralist societies in other parts of Africa (Mason, 1984).

Some is evidence from this part of Kunene Region for human occupation over at least the last one million years. The earliest evidence, dating from the mid-Pleistocene, is primarily in the form of crude stone implements found as surface scatters in the vicinity of major drainage lines. Later Pleistocene remains include well fashioned bifacial stone hand-axes which in the last 200 000 years were superseded by a complex toolkit of smaller artefacts that could be attached to wooden spear shafts and scraper tool handles, using vegetable resin mountant.

According to the National Heritage Council of Namibia, Kunene Region has about 7 known heritage sites which are listed as national monuments (Declared Sites/Lists of National Heritage). The table below (*Table 12*) shows the declared heritage sites in Kunene Region in Namibia. However, these declared heritage sites are occurring far from the proposed project.

Table 12: Declared Heritage Sites in Kunene Region

Designation	Description	Built/Construction Period	Location	Monument number
Rock Engravings at Peet Alberts Koppie	Rock engravings		Kamanjab Karte	036/1967
Naulila-Denkmal	Monument	1933	Outjo Karte	052/1971
Stone Tower	Wasserturm	1900	Outjo Karte	027/1975
Dorsland Tractor Cottage	Historic building	1878		009/1951
Petrified Forest	Petrified Wood	250 million years	Khorixas	004/1950
Twyfelfontein	Cave, rock carvings	about 4000 BC Chr	Khorixas	016/1952
Burnt Mountain	Rock Formation	80 million years	Khorixas	024/1956

10.2. The General Archaeological Environment Sequences of the Southern Africa.

The Southern African archaeological environment is divided into the Stone Age, the Iron Age and the Historical Period. **Table 13** below summaries different period in relation to the technological advancement and cognitive evolution.

Table 13: The Archaeological context: Sequence, Period and definitions

Period	Approximate Dates
Early Stone Age	> 2 600 000 years ago – 250 000/200 000 years ago
Middle Stone Age	250 000/200 000 years ago – 40/25 000 years ago
Later Stone Age	25 000 years ago – AD 200 (up to historic times in certain areas)
Early Iron Age	AD 200 – AD 900/1000
Middle Iron Age	AD 900/1000 – AD 1300
Late Iron Age	AD 1300 – AD 1850

Source: (Sampson, 1974).

10.3. Archaeological Sequence in Namibia

In order to put Namibian heritage and archaeological contexts into perspective, the following information is crucial to the general understanding of the occurrence and the associated period in different time-frames that would represent the known human occupation sequence in Namibia

and Southern Africa in general. This helps in building knowledge about past adaptations and cultural dynamics. According to Nankela (2017), the archaeological sequences of Namibia can be summarized as follow (Table 14).

Table 14: Archaeological sequences in Namibia

Period	Year	Area/Location	Evidence	Description
Pleistocene	400 000- 100 000	Namib Plains, Namib Desert & Lower Kuiseb	Bone fragments of extinct elephant and stone tools	
Holocene	10 000 - 1 000	Around Namibia	Scattered artefacts, rock art sites, potsherds, beads, grave cairns, hut circles, human remains, axes, pointed flakes, cleavers and blades.	Sites are fragile, inaccessible and due to inadequate archaeological investigations in some sites.
Historic Period	500	Around Namibia	Cemeteries, old mine workings, waste rock walling, architectural heritage and WWI military engagements.	Namibia has an indication of intensive settlements between indigenous people and Europeans.

11. Physical and Environmental Context of the area

11.1. Vegetation and Landscape

The proposed project area is situated within north-east of Opuwo town in the Kunene region, the study area is topographically situated in an undulating and hilly landscape. The vegetation of the project proposed area/landscape is mainly dominated by Mopane savanna (*Colophospermum Mopane*), mixed woodlands, Acacia trees, grasses species such as bushman grasses and *Stipagrostis* spp and other shrubs type of vegetation (Figures 5 & 6).

Site context in terms of Vegetation and Landscape



Figure 5: The view of vegetation type in the study area



Figure 6: The typical vegetation type view toward the northeaster direction within the ML 249.



Figure: The landscape within the subject land of ML 249.

12. Assessment of the findings within the ML 249

12.1. On-site findings

The proposed project area is dominated by the communal land. Existing databases and the use of GIS data and spatial analysis did not indicate any of historical or archaeological sites occurring nearby or within the vicinity of the Mining Licence 249 (*Figure 7*). The ground survey also could neither locate nor record any significant archaeological objects, artifacts, sites or heritage sites within the subject lands. From archaeological and heritage perspective, the subject land is of low archaeological significance, this comes as a result of on-surface site survey that did not yield or locate any archaeological or cultural materials. Also, none of the surveyed areas contained any visible graves.

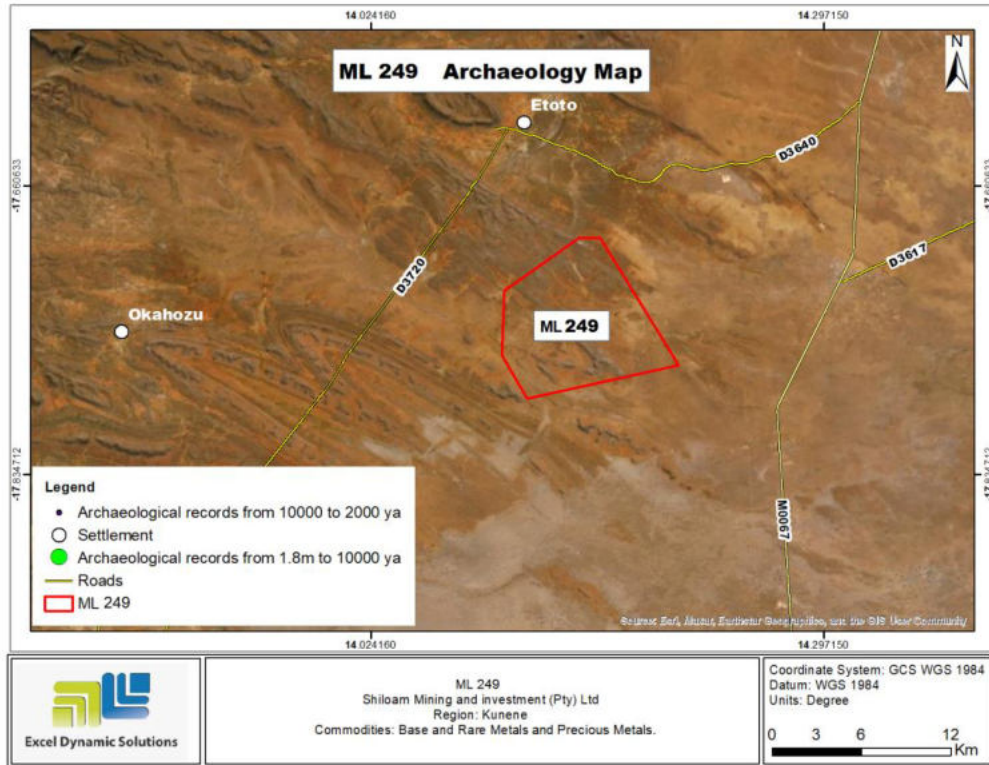


Figure 7: A satellite imagery of an archaeological map that could not locate any sites of national significance within the vicinity.



Figure 8: The typical natural environments of the subject land (ML 249).



Figure 9: A recorded naturally formed calcrete rock within the subject lands.

Grading and Rating of the Heritage resources

The grading of archaeological and heritage resources as developed by National Heritage Council of Namibia is not applicable for this particular ML 249 as there were no archaeological sites nor findings of archaeological interests occur on the footprint, and therefore the rating system does not apply. Not applicable as no heritage sites occur on the footprint.

13. Potential Impacts on Archaeological, Historical and Cultural Heritage sites

This section describes the potential impacts that may emanated from the proposed project especially during the pre-construction, construction and operational phases as far as mining activities are concerned.

13.1. Potential Impact on Archaeological sites/Stone artifacts

The direct archaeological impact can occur during land clearance or construction of infrastructures in the area such as establishing a new access road, setting up of camp site or sitting of equipments for mining works. To mitigate and reduce chances of occurrences of sub-surface archaeological disturbances, proper caution should be considered when deciding on where to construct or set up of infrastructures so as to avoid a proliferation of land disturbance in the project footprint and associated areas.

During the site surveys, the only scatter or surface artifacts observed in a contextualized environments were mostly the calcrete stones and these are naturally shaped and occurrences, archaeologically these occurrence can be regarded as geofacts rather than artifacts. The expected impact is **LOW**.

13.2. Potential Impact on Historical sites

There are no any significant historical sites observed in the surveyed areas within the ML 249, only the sites which are deemed to be of national historic and heritage significance in the Kunene Region are situated in Kamanjab town, Khorixas and Outjo town of which their presence are reported in this report (*refer to Table 12 above*), and therefore the impact is expected to be **LOW**.

13.3. Potential Impact on Built Environment resources

There were no recorded built heritage resource in the environments of which the ML 249 falls, outside the ML boundaries the settlements are quite far as can be seen on *Figure 1* above. Similarly, the expected potential impact on built environment is expected to be low/negligible.

13.4. Potential Impact on Graves/Cultural site

Archaeologically, graves and burial sites are deemed to have high cultural significance at the local level for their social value and cultural norms. However, the site survey undertaken did not locate any visible grave or burial site. However, since graves can occur anywhere within the landscape more specifically during mining activities, mitigation is possible and will entail a pre-construction survey to locate any more of unmarked and sub-surface graves that might be present within the footprint. exploration works should be effected to try avoid graves if possible but any that cannot be avoided will require exhumation and possibly reburial but for this to happen a necessary permit is required from National Heritage Council of Namibia. Project Proponent is cautioned that '**Chance find**' is mandatory and should be complied throughout the operational and mining phase of the project.

Table 15: Summary of the findings at the site of Interest (ML 249)

Archaeological and Heritage Resources	Findings
Buildings, structures, places of cultural significance	There was no recorded place with building structures, built heritage or cultural significances in the surveyed areas.
Areas to which or are associated with cultural heritage.	None.
Archaeological, historical or heritage sites.	None.
Graves and burial grounds,	None.
Movable objects	None
Overall comment	The surveyed areas did not yield any significant materials or sites to be considered as archaeologically significant. However, precautions should be taken by the Proponent when operation of the proposed project commence as to adhere and adopt the chance find procedures and other mitigations measures as recommended by the author of this report in section 14.2.

It should be noted that the site survey did not located any visible grave or burial sites in the surveyed areas, however the impact evaluation tabulated or discussed herein is for invisible and sub-surface graves that might occur or discovered in the course of mining works within the ML 249 and the subject land (targeted land, and hence the rating system presented is for the same purposes of the yet to be discovered graves and burial places.

13.5. Tabulated summary of the Impact evaluation of the proposed project on heritage resources within the curtilage of the site and the surrounding area for the ML 249

Table 16: Cultural site: Grave and Burial sites

Activity: During the mining activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological, historical, heritage and cultural material or objects.		
	With Mitigation	Without Mitigation
Extent	Local	Local
Duration	Short-term	Long-term
Magnitude	Low	Medium to High
Significance	2	4

Vulnerability	2	4
Reversibility	Not reversible	Not reversible
Can impacts be mitigated?	Yes	
Mitigation	Graves and burial sites are of high significance in terms of cultural value and society norms. The proper way of handling any occurrence of the previous unknown or invisible graves is 'Chance Find Procedures' i.e. to stop everything if something has been found and follow the steps recommended in Section 14.2 and Table 22 .	
Cumulative impacts	Cultural Heritage sites are non-renewable and any impact on any archaeological context or cultural material will be permanent and destructive. In terms of the cumulative impact of this proposed project and other developmental projects in ML 249, the impact on the heritage landscape and sites of low/medium heritage significance might be increased as these sites area can be accidentally destroyed through development.	
Residual Impacts	With implementation of mitigation measures mentioned herein this report, the significance level of the impacts identified will be reduced to either minor low or negligible.	

Table 17: Stone Artifacts of the Study Area

Activity: During the mining activities resulting in disturbance of surfaces and/or sub-surfaces may destroy, damage, alter, or remove from its original position archaeological artifacts and cultural material or objects.		
	With Mitigation	Without Mitigation
Extent	Local	Local
Duration	Short-term	Long-term
Magnitude	Low	Low to Medium
Significance	2	3
Vulnerability	2	3
Reversibility	Not reversible	Not reversible
Can impacts be mitigated?	Yes	
Mitigation:	Few of the located stone artifacts within the areas surveyed have little or low archaeological significance. The finds can be termed as an isolated finds, they were fewer and less than 40 meter diameter area. The recommendations made in this report covers all of the possibilities of prevention for, and minimizing negative impacts to yet to be discovered artifacts.	

Cumulative impacts:	Archaeological sites are non-renewable and impact on any archaeological context or material will be permanent and destructive.
Residual Impacts:	With implementation of mitigation measures mentioned herein, the significance level of the impacts identified will be reduced to either low or negligible.

This site survey involved direct observation (site surface or field walking), with archaeological and cultural significant areas positions determined in the field by hand-held Garmin *etrex* 30x GPS. The sites themselves are documented according to conventional criteria of type, physical setting and spatial extent. In the field, all identified archaeological, cultural and historical sites are assessed as to their significance, grading them accordingly and vulnerability, using two independent parallel scales devised for archaeological assessment in Namibia (*Tables 8 - 10*). The archaeological and cultural places within this ML 249 are of cultural significance at a local level, and thus vulnerability rating can be classified as having probable threat from in-advertent disturbance due to proximity of development as outlined in *Table 21 below*. The criteria used here for vulnerability is just to show how the extent of vulnerability can be recorded but it should be noted that the threats are going to be minimized/reduced or eliminated with the mitigation measures that are recommended in this report (refer to *section 14.2*).

Table 18: Heritage Resources and Vulnerability Description

Archaeological, Cultural and Heritage Resource	Scale	Vulnerability Description
Community grave site	0	Not vulnerable. Absence of community grave within the farms surveyed in ML 249.
Grave and Burial site	0	Not vulnerable. Absence of graves within the surveyed in ML 249.
Historical and Heritagel sites	0	Not vulnerable. Absence of historical and heritage resources within the surveyed in ML 249. No threat posed by current or proposed development activities. The sites which are deemed to be of heritage significance are in Outjo, Khorixas and Kamanjab towns which are very far from the proposed project.

Existing buildings and structures (still standing and in-use)	0	Not vulnerable. Absence of building structures within the surveyed in ML 249
Stone artifacts/geofacts	2	low or indirect threat from possible consequences of development (e.g. soil erosion)

13.6. Identification of alternatives

There are no located alternatives site for the proposed project at the moment, this is due to fact that the proposed mining site has proved to host significant quantities of the targeted minerals however the layout will be designed accordingly to avoid any chances of damage to the yet undiscovered subsurface archaeological materials and invisible graves. This is to indicate that if the site of significance is located already, the project has to find an alternative location to either avoid the site completely, mitigate it or rescue it before any damage could be done, and to do this a permit from National Heritage Council of Namibia will be required.

13.7. Anticipated Impacts on Historical and Heritage Resources

All known significant archaeological and heritage resources (aside from the landscape within the subject land) are situated in Outjo, Khorixas and Kamanjab towns. It is possible that as yet undiscovered archaeological sites or materials might lie within the proposed footprint but the chances of significant impacts are deemed to be low. The landscape will be impacted by the proposed project, but such impact is unavoidable if the facility is to be constructed or clearance of the land as well as mining activities. However, there are socio-economic benefits associated with the project, both in terms of provision of jobs and livelihood improvement of the nearby villages, community and places such as Opuwo and nearby residents.

13.8. Residual Cumulative Environmental Effects

Although some archaeological materials such as stone artifacts and consequently sites are likely to be destroyed or lost during the clearance of land and construction of other facilities necessary for mining activities. Impacts to buildings and graves would be extremely rare to zero and make no contribution to the assessment of cumulative impacts as there were no located graves or structures in the surveyed areas. Similary, the focus of mitigation measures in this report is to recommend the layout of the project to avoid any possibilities of encountering significant heritage or archaeological sites and will thus make a negligible contribution to cumulative impacts. The cumulative impacts are deemed to be of **low** significance in this case but with project specific mitigation as listed in **section 14.2** this would drop to **very low** after mitigation.

14. Management Plan and Mitigation measures

Detailed mitigation measures are given herein in form of recommendations (refer to the bulleted list in **section 14.2** below under conclusion and recommendation section). These mitigation measures will be included and implemented along with the general EMP of the project, as well as the implementation of **Chance Find Procedures** and **Heritage Monitoring Plan** for the proposed project as set out in **Appendix 1** below.

14.1. Conclusion and Recommendation

Generally, the area of interest might undergo some new changes as far as the proposed project is concerned, the possibilities of new access roads (*if needs be*), establishing of camping sites, sitting of equipments, laying down of infrastructures that may obliterate surface indicators of heritage resources if any ever occurred in the study area, with mitigation recommended in this report, and *Chance Find Procedure* the overall impact is expected to be low. Therefore, this project can commence but subject to the condition that the following recommendations (**Section 14.2**) are implemented as part of the EMP and based on the approval from National Heritage Council of Namibia as an Authority body.

14.2. Recommended Mitigations

It is extreme important for the Project Proponent, and all those involved in the project to fully understand that all archaeological and palaeontological objects and meteorites are the property of the State, except such an archaeological or palaeontological object the private possession and ownership of which (a) was acquired not in contravention of **section 12** of the National Monuments Act, 1969 (Act No. 28 of 1969) or a law repealed by that Act; Therefore, as part of mitigation measures it should be noted, according to National Heritage Act No. 27 of 2004 that all activities that will involve digging or excavating the ground will require a permit from National Heritage Council of Namibia.

- If any archaeological material or human burials are uncovered during the course of mining activities, then work in the immediate area should be halted, the find would need to be reported to the heritage authorities and may require inspection by an archaeologist.
- Buffer zones should be maintained around known significant archaeological, historical or cultural heritage sites as far as possible. If graves and areas of cultural significance are to be unearthed or discovered during the exploration, they should be excluded from any development.

- A “No-Go-Area” should be put in place where there is evidence of sub-surface archaeological materials, archaeological site, historical, rock paintings, cave/rock shelter or past human dwellings. It can be a demarcation by fencing off or avoiding the site completely by not working closely or near the known site. The ‘No-Go Option’ might have a NEUTRAL impact significance.
- On-site personnel (s) and contractor crews must be sensitized to exercise and recognize “chance finds heritage” in the course of their work.
- During the mining works, it is important to take note and recognize any significant material being unearthed, and making the correct judgment on which actions should be taken (*refer to CFP Appendix 1 below*).
- If there is a possibility of encountering or unearthing of archaeological materials then it is better to change the layout design so as to avoid the destruction that can occur.
- Direct damage to archaeological or heritage sites should be avoided as far as possible and, where some damage to significant sites is unavoidable, scientific/historical data should be rescued.
- All ground works should be monitored and where any stratigraphic profiles in context with archaeological material are exposed, these should be recorded, photographed and coordinates taken.
- The footprint impact of the proposed mining activities should be kept to minimal to limit the possibility of encountering chance finds within the ML boundaries.
- A landscape approach of the site management must consider culture and heritage features in the overall planning of mining infrastructures within and beyond the licenses’ / ML boundaries;
- Subject to the recommendations herein made and the implementation of the mitigation measures, adoption of the project HMP/EMP should be complied.
- An archaeologist, Heritage specialist or a trained Site manager should be on-site to monitor all significant earth moving activities that may be implemented as part of the proposed project activities.
- When there is removal of topsoil and subsoil on the site for exploration purposes, the site should be monitored for subsurface archaeological materials by a qualified Archaeologist or Site manager.
- Show overall commitment and compliance by adapting “minimalistic or zero damage approach” throughout the exploration activities.

- In addition to these recommendations above, there should be a controlled movement of the people i.e. a contractor, mining crews, equipments, setting up of camps and everyone else involved in the mining activities. This is recommended to limit the proliferation of informal pathways, gully erosion and disturbance to surface and sub-surface artifacts such as stone tools and other buried materials, etc.
- There should be a controlled movements of heavy loads such as abnormal vehicles and kinds of heavy duty machineries within the ML. This means avoiding chances of crossing paths that may lead to the destruction of on and sub-surface archaeological materials
- It is essential that cognizance be taken of the larger historical landscape of the area to avoid the destruction of previously undetected heritage sites. Should any previously undetected heritage or archaeological resources be exposed or uncovered during exploration phases of the proposed project, these should immediately be reported to the heritage specialist or heritage authority (National Heritage Council of Namibia).
- The Proponent and Contractors should adhere to the provisions of Section 55 of the National Heritage Act in event significant heritage and culture features are discovered in the course of exploration works.
- Whoever is going to be in charge of mitigation and monitoring measures should have the authority to stop any exploration or construction activities that is in contravention with the National Heritage Act of 2004 and National Heritage Guidelines as well as the overall project EMP.

It should be taken into consideration that, according to **Part VI sub-section (1), (2) or (3)** A person who contravenes these provision commits an offence and is liable to a fine not exceeding N\$100 000 or to imprisonment for a period not exceeding 5 years, or to both such fine and such imprisonment. A Project Proponent should heed to these recommendations and comply to the existing legislation and Act as reflected in this report.

14.3. Statement and reasoned opinion of the specialist

The overall impact of the proposed project is expected to be low and residual impacts can be managed to an acceptable level through the implementation of the recommendations made in this report. This has to be in-conjunction with deliberately actions and informed decisions on Proponent's awareness and compliance to the proper procedures on how to protect and preserve the located and yet to be discovered archaeological and heritage resources as laid out in this report by the Author.

15. References

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Appendix 1: Archaeological “Chance Finds Procedure”

This survey is based on surface indications alone, and it is therefore possible that sites or items of significance will be found by chance in the course of development work. Therefore, the intent of this Chance Find Procedure is to provide the construction and exploration crews with general guidelines for the appropriate response to the discovery of known, unknown or suspected archaeological materials, including human remains, during Project activities. While Chance Find Procedures are valuable, they are not a substitute for prior assessment and evaluation of archaeological resources. The objectives of these guidelines are to promote the preservation and proper management of heritage resources that are unexpectedly encountered during Project activities and to minimize disruption to construction activities and scheduling.

A step-by-step Chance Find Procedure is provided below for archaeological sites and accidental findings. Contacts information are as well provided in **Appendix 1** and the general Archaeological and Heritage Management Plan is set on **Appendix 2**.

Scope:

The “chance finds” procedure covers the actions to be taken from the discovery of an archaeological site or item, to its investigation and assessment by a trained archaeologist or other appropriately qualified person. This procedure 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 object must as soon as practicable report the discovery to the Council”*. The procedure of reporting set out below must be observed so that archaeological remains reported to the NHC are correctly identified in the field.

Project Manager or ECO/Site Manager/Supervisor must report the finding to the following competent authorities:

- **National Heritage Council of Namibia (061 244 375)**
- **National Museum (+264 61 276800),**
- **National Forensic Laboratory (+264 61 240461).**

Heritage Monitoring and Management Requirements

Throughout the prospecting and exploration phases of the proposed project, monitoring is necessary to ensure compliance with measures agreed upon in the recommended mitigation as well as to assess how effective the mitigation measures are in protecting the values and

significance of the heritage resources. This can be achieved through regular monitoring of the project site or random visits the compliance with measures outlined in the recommendation section are monitored, recorded, and reported. However, in principle, heritage monitoring and management should be conducted and implemented by an archaeologist/heritage specialist or a trained personnel while other activities especially day to day monitoring can be done by Environmental Control Officer (ECO) or in some cases a trained Site manager can be responsible for this.

Site monitoring: As most heritage resources occur below surface, all earth-moving activities need to be routinely monitored in case of accidental discoveries. The greatest potential impacts are the initial soil removal and subsequent earthworks during prospecting/exploration or construction. The ECO should monitor all such activities daily. If any heritage resources are found, the chance finds procedure must be followed as outlined in **Appendix 1** and **2**.

Monitoring is generally only considered appropriate where changes are probable or likely, and where these changes could be significant and would require remedial or specific management measures. This process can be done in all stages of prospecting and exploration, and during the actual mining where more impact on archaeological and heritage resources are probable.

Appendix 1: Archaeological and Heritage Monitoring Measures

Table 19: Chance Find and Heritage Monitoring Measures

Area/Site	Archaeological/Heritage Aspect	Potential Impact	Mitigation Measures	Responsible Party	Method Statement required
<p>Chance Find (Chance Archaeological and Heritage sites (Accidental discoveries)</p>	<p>General area where the proposed project is taking place (i.e. construction and mining etc.) which may yield archaeological, cultural materials or human remains.</p> <p>This means that there are possibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.</p>	<p>Possible damage to previously unidentified Archaeological and heritage sites during construction and mining phase.</p> <p>Unanticipated impacts on archaeological sites where project actions inadvertently uncovered significant Archaeological sites.</p> <p>Loss of historic cultural landscape;</p>	<p>In situations where unpredicted impacts occur construction activities must be stopped and the heritage authority should be notified immediately.</p> <p>Where remedial action is warranted, minimize disruption in exploration or construction scheduling while recovering archaeological data. Where necessary,</p>	<p>Project Proponent- Contractor/ Mining crews, Project Manager (PM) / Environmental Control Officer (ECO) or Site Manager, On-site / standby Archaeologist</p>	<p>Monitoring measures should be issued as instruction within the Project EMP.</p> <p>PM / ECO / Site Manager / Archaeologist</p> <p>Should monitor mining activities on the targeted sites within the project site.</p>

Area/Site	Archaeological/Heritage Aspect	Potential Impact	Mitigation Measures	Responsible Party	Method Statement required
		<p>Destruction of burial sites and associated graves (if any)</p> <p>Loss of aesthetic value due to construction work</p> <p>Loss of sense of place</p> <p>Loss of intangible heritage value due to change inland use.</p>	<p>Implement emergency measures to mitigate.</p> <p>Where burial sites are accidentally disturbed during construction, the affected area should be demarcated as 'no-go zone' by use of fencing during construction, and access there to by the construction team must be denied.</p> <p>Accidentally discovered burials in development</p>		

Area/Site	Archaeological/Heritage Aspect	Potential Impact	Mitigation Measures	Responsible Party	Method Statement required
			<p>context should be salvaged and rescued to safe sites as may be directed by relevant heritage authority.</p> <p>The heritage officer responsible should secure relevant heritage and health authorities permits for possible relocation of affected graves accidentally encountered during construction work.</p>		
Compliance Review	<p>A review of archaeological and cultural heritage incidents, their impacts, mitigation used and success of mitigation should be conducted at a certain stage of the project. The review should be looking at mitigation measures in place, and ways of improvement if needed. This exercise can be done after every 6 months or whenever the Project Proponent see fit. The overall objective is to</p>				

Area/Site	Archaeological/Heritage Aspect	Potential Impact	Mitigation Measures	Responsible Party	Method Statement required
	ensure a full compliance with relevant legislation especially Under Section 5 (4) of the National Heritage Act No. 27 of 2004, Chance Find Procedure, and the recommendations made by the Heritage Specialist.				

Appendix 2: Archaeological and Heritage Management Plan

Table 20: Management Plan

Area	Mitigation	Phase	Timeframe	Responsible party for implementation	Target	Performance Indicators (monitoring tool)
General project area more specifically the targeted areas and surrounding vicinity	Implement chance find procedures in case possible archaeological or heritage finds are uncovered or expected	Pre construction, construction and mining.	Throughout the project phases (the actual mining phase)	Project Proponent, Contractors and Mining crews on site	Ensure compliance with relevant legislation and recommendations from Author of this report, and National Heritage Act that aims to provide for the protection and conservation of places and objects of heritage significance	ECO Checklist/Report

Appendix 3 : CV of a Specialist

Personal Information:

Name: Roland Mushi
Address: P.O. Box 19730, Omuthiya - Namibia
Mobile phones: (+264) 813332373 (+264) 853332373
Email: rolandmushi@gmail.com/ rolandm@edsnamibia.com
Nationality: Tanzanian
Residence Status: Namibian Domiciled
Sex: Male
Marital Status: Married
Driver's license: Valid (Category B and D)

Educational Qualifications:

- Graduated from the Institute of Resource Assessment-University of Dar-Es-Salaam in **Masters of Science in Natural Resources Assessment and Management**, September 2007-November 2009
- Graduated from the University of Dar-Es-Salaam in **Bachelor of Arts (Hons) (History and Archaeology)** September 2004-June 2007

Key Qualification:

Area of expertise: Archaeology and Cultural Heritage Management, Historical studies, Anthropology and Ethnographic studies, Natural Resource Management, Environmental Assessments, Socio-Economic Livelihoods and Baseline Studies. Previously, he has worked full-time as a Research Technician at Gobabeb Research and Training Centre in the Central Namib Desert within Namib Naukluft Park, as well as Part-time Researcher for Namib Ecological Restoration and Monitoring Unit (NERMU) along Kuiseb, Khan and Swakop Rivers for Swakop Uranium Project. He is currently working as a full-time Archaeologist and Heritage Specialist, based in Windhoek, Namibia.

Field work and Project Experience

Roland has extensive fieldwork experience as both Researcher and Field Coordinator throughout the Central Namib parts, as well as north-western and southern parts of the country.

Short-course attended

- Geoheritage in Africa Online Short Course 20-24 September 2021, IGCP outreach and capacity building for African geoscientists: Linking geoheritage, artisanal mining and indigenous knowledge systems. This Course was conducted by University of the Witwatersrand, South Africa.

Employment records/Work Experience:

Excel Dynamic Solutions (Pty) Ltd from August, 2021 (Full-time)

Position: Archaeologist and Heritage Specialist

Namibia Development Trust: Consultant, February – March 2021

- Assist with the development of minimum five (5) project proposals in line with the call for Proposals by the NILALEG Project for the Ruacana Landscape (Kunene and Omusati regions).

February, 2020 – March, and June, 2020 – July, 2020: Field Research Coordinator for Namib Ecological Restoration and Monitoring Unit (NERMU) at Gobabeb Research and Training Centre

September, 2019 - December 2019: Field Research Coordinator for Namib Ecological Restoration and Monitoring Unit (NERMU) at Gobabeb Research and Training Centre

July, 2019 – Research Assistant for Namib Ecological Restoration and Monitoring Unit (NERMU) at Gobabeb Research and Training Centre

March 2019 – May, 2019 Research Assistant for Namib Ecological Restoration and Monitoring Unit (NERMU) at Gobabeb Research and Training Centre.

From October 2018- December 2018 (Research Assistant) Namib Ecological Restoration and Monitoring Unit (NERMU) at Gobabeb Research and Training Centre.

From 2016 - 2018 (Full-time employee)

Research Technician and Social Scientist at Gobabeb Research and Training Centre (Namib Desert-Namibia)

From February 2012 to June, 2014: Research Consultant

Employer: Ideal Consulting Group Tanzania Ltd, Dar Es Salaam, Tanzania

From 2009 to December 2011: Researcher (Social Scientist)

Employer: East Africa Resource Group (EARG), Dar-Es-Salaam, Tanzania

Papers and Publications (Main and Co-Authorship)

- Frey M.M, Hase F., Blumenstock T., Dubravica D., Groß J., Göttsche F., Handjaba M., Amadhila P., **Mushi R.**, Morino I., Shiomi K., Sha M. K., Martine de Mazière, and Pollard D.F. (2021). Long-term column-averaged greenhouse gas observations using a COCCON spectrometer at the high surface albedo site Gobabeb, Namibia (*Published*)
- Rossingol, S., Napolitano, D., Giorio, C., **Mushi, R.**, Maggs-Kolling, G., D’Anna, B., Coulomb, B., Buodenne, J., Piketh, S., Namwoonde, A., Forment, P., Herckes, P., Monod, A. (2017), Fog water chemical composition during the AEROCLO-SA campaign. (*Published*)
- Kaseke, K. F., Wang, L., Tian, C., Seely, M., Vogt, R., Wassenaar, T., **Mushi, R** (2017), Fog spatial distributions over the Central Namib Desert-An Isotope Approach. Department of Earth Sciences, Indiana University-Purdue University Indianapolis, Indianapolis. Published by Aerosol and Air Quality Research (ID AAQR-17-01-FOG-0062.R2)
- **Mushi, R. S.** (2011), Climate change and the Coastal Environment-Implications on Coastal Tourism in Bagamoyo District, Tanzania, LAMBERT Academic Publishing, Germany (*Published*).
- **Mushi, R. S.**, Kauzeni, A.S., Kangalawe, R.YM. (2009), Climate Change and Impacts on Coastal Tourism: A Case of Bagamoyo District. The paper was show cased, displayed and published in the book titled ‘People’s Perceptions and Community Responses to Climate Change and Variability. Selected Cases from Tanzania’ in UNFCCC COP15 in Copenhagen, Denmark (7th -18th December, 2009).
- Mongi, H. J., Majule, A. E., **Mushi, R. S.**, Andrew, B., Ndesanjo, R. (2008), *Addressing Land Degradation in Tanzania: Contemporary issues related to policy and Strategies* (*published*).

Some conferences and Workshop attended

- Attended the Past, Present and Future of Namibian Heritage Conference from 28th- 31st August 2018 Windhoek, Namibia.

- Attended a conference on Environmental Education under the theme “Innovative Strategies to develop peaceful co-existence with the endangered wildlife” held at B2Gold Otjikoto Nature Reserve from 3rd to 6th May 2018. The conference was convened by NEEN.

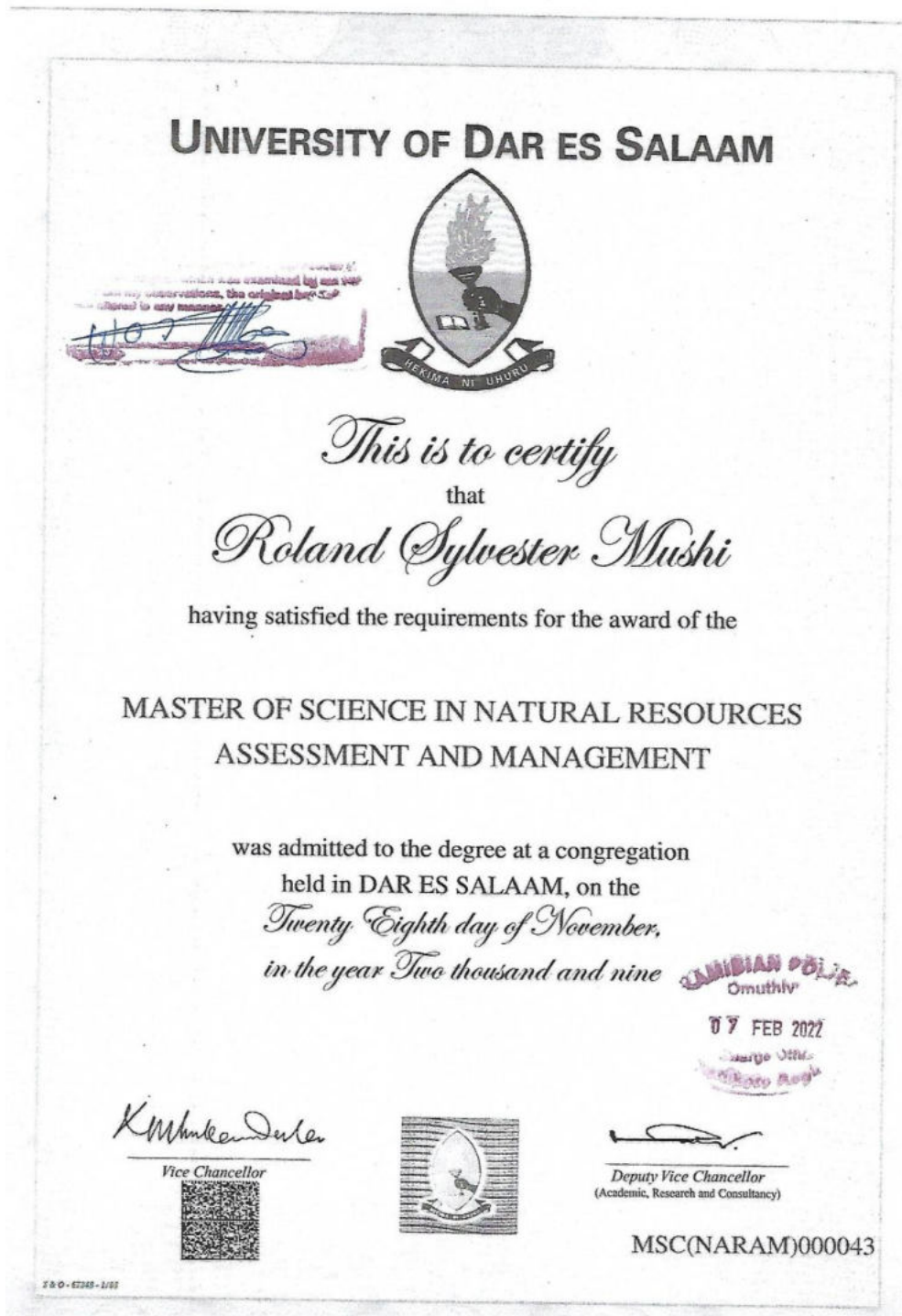
Language Skills

- Swahili (*mother tongue*)
- English (*fluent*)
- Oshiwambo (*beginner level*)
- German language (*little command*)

Membership in Professional Bodies

- Environmental Assessment Professionals of Namibia (EAPAN)-Registered as Lead Practitioner, Practitioner and Environmental Manager-Membership No. 179
- Museum Association of Namibia (MAN)
- South African Museums Association (SAMA)-Membership No. NCM 008
- Association of Southern African Professional Archaeologists (ASAPA)- Membership No. 480
- Namibian Environmental Education Network (NEEN)

Appendix 4: Certificates and Relevant Documents including ID and Certificate of Identity



UNIVERSITY OF DAR ES SALAAM



of the original which was examined by me, and
in case my observations, the original has not
been altered to any manner.

[Signature]

This is to certify

that

Roland Sylvester Mushi

having satisfied the requirements for the award of the

DEGREE OF
BACHELOR OF ARTS
(HISTORY AND ARCHAEOLOGY)
WITH HONOURS,

Second Class, Upper Division

was admitted to the degree at a congregation
held in DAR ES SALAAM, on the
Twenty Fourth day of November,
in the year Two thousand and seven

CAMBIA POLICE
Omuthly
07 FEB 2022
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Mankoto Road

[Signature]

Vice Chancellor



[Signature]

Deputy Vice Chancellor
(Academic, Research and Consultancy)

BA(HA)000050



REPUBLIC OF NAMIBIA

007810

MINISTRY OF HOME AFFAIRS AND IMMIGRATION

IMMIGRATION CONTROL ACT, 1993

CERTIFICATE OF IDENTITY
(Section 38/Regulation 26)

CERTIFICATE NO: 007810 REFERENCE: 13/4/9-414/16

It is hereby certified that the Minister of Home Affairs and Immigration has under Section 38 of the Immigration Control Act, 1993 (Act 7 of 1993) authorised the issue of a certificate of identity to:

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PASSPORT NUMBER: TAE029908

DATE OF ISSUE OF PASSPORT: 12 JUNE 2018

PASSPORT ISSUE BY: TANZANIA

DATE OF EXPIRY OF PASSPORT: 11 JUNE 2028

WINDHOEK POLICE FORCE
Karas REGION
2022-02-17
WINDHOEK
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DATE OF ISSUE: 02 NOVEMBER 2021

DATE OF EXPIRY: 02 NOVEMBER 2022

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LOST AND FOUND

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Biodiversity Impact Assessment the Proposed Copper Mine, Opuwo Area



September 2022

Author: Ms. O Katali

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1. ML 249 BIODIVERSITY IMPACT ASSESSMENT

1.1. Methods and approach

1.1.1. Impact assessment method

Slootweg and Koolhof 2003 defined three essential questions that have to be answered in BIA studies:

- a. For non-use values related to biodiversity: Does the intended activity **affect the physical environment** in such a manner or **cause such biological losses** that it influences the chance of extinction of cultivars, varieties, and populations of species, or that it changes the quality of habitats or ecosystems?
- b. For use values derived from biodiversity-related functions:
 - i. For production functions: Does the intended activity surpass the maximal sustainable yield of a resource, population, or ecosystem?
 - ii. For processing and regulation functions, carrying functions and product functions: **Does the intended activity surpass the maximum allowable level of disturbance?**

The above context was used as a guide to assess each potential impact for the three main stages of the project development, namely construction, operations and closure. Actual impact assessment was done in six steps, detailed in Table 1.

Table 1. The six steps of impact assessment used in the current study.

Assessment step	Description	
1	Description of the natural environment.	Results from the overall investigation and surveys, described in Section 3-6 of the ML 249 ESIA.
2	Identification of key biodiversity components and ecological processes.	These are features without which the natural character of the area would be entirely lost. If impacts to these aspects could be minimised or avoided, the structure and function of the ecosystem might be maintained.
3	Drafting of a list of sources of risks to biodiversity integrity.	Any factor that could disturb or alter the physical environment and/or cause biological losses in such a manner that it influences the probability of extinction for biodiversity components, or that it disrupts ecosystem processes to the extent that habitat quality is affected.
4	Definition of a number of discrete potential impacts emanating from the potential risks, and a description of the nature of each.	Not all sources of risk will lead to actual impacts and some different sources of risk may lead to the same impact. Here the impacts expected to occur as a result of specific activities or physical infrastructure, are defined.
5	An evaluation of each potential impact in terms of a number of criteria, with a final summary assessment in terms of its overall significance.	The criteria are detailed in Table 2. Final evaluation of each impact's significance also included an overall specialist assessment of the spread of all the criteria, as well as a comparison with other impacts.
6	The identification of management and monitoring actions for each potential impact.	Management – a set of management actions, including avoidance, mitigation and restoration, and offsets required to decrease the risks to the biodiversity feature, or to decrease the effects of the impact. Offsets are a viable option once all



Assessment step	Description
	<p>management actions have been taken into considerations and there remain impacts that cannot be managed. Offsets require careful planning, assessing and management in order to be effective.</p> <p>Monitoring – a summary list of required activities as well as variables that need to be measured over the short, mid- and long-term, defined as part of an adaptive management plan.</p>

1.1.2. Impact assessment framework

The “Hacking” method was used to assign different levels of significance to each defined impact. The framework for this method is provided below (Table 2).

Table 2. A framework for impact assessment listing the criteria used in determining the significance of impacts, and their possible levels or categories.

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE	Significance = consequence x probability	
Definition of CONSEQUENCE	Consequence is a function of severity, spatial extent and duration	
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	H	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	L	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	L	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE

SEVERITY = L

DURATION		H	Medium	Medium	Medium
Long term		H	Medium	Medium	Medium
Medium term		M	Low	Low	Medium
Short term		L	Low	Low	Medium

SEVERITY = M

DURATION		H	Medium	High	High
Long term		H	Medium	High	High
Medium term		M	Medium	Medium	High



	Short term	L	Low	Medium	Medium
SEVERITY = H					
DURATION	Long term	H	High	High	High
	Medium term	M	Medium	Medium	High
	Short term	L	Medium	Medium	High
			L	M	H
			Localised Within site	Fairly widespread Beyond site	Widespread Far beyond site
			boundary Site	boundary Local	boundary Regional/ national
SPATIAL SCALE					

PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	H	Medium	Medium	High
	Possible/ frequent	M	Medium	Medium	High
	Unlikely/ seldom	L	Low	Low	Medium
			L	M	H
CONSEQUENCE					

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	Decision guideline
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

*H = high, M= medium and L= low and + denotes a positive impact.

1.2. Project description

The project description documentation provided in May 2022 refers. This describes the activities and infrastructure and personnel that will be deployed during different stages of mining: Construction, Operational and Decommissioning.

1.3. Sources of risk and impact mechanisms

1.3.1. Sources of risk to the biodiversity features expected as a result of mining, mining-related activities and infrastructure of the ML 249 Copper Mining Project

- Land clearing
- Construction of infrastructure
- Mining and mine-related activities, including blasting, placement of waste rock dumps, crushing, loading, ore processing by mechanical and chemical means, tailings, and a range of support services
- Use of road by heavy trucks
- Use of road by commuting staff and service providers using buses and light motor vehicles



- Abstraction of groundwater and dewatering of pit, lowering groundwater levels
- High-density human presence
- Pollution, waste and outdoor toiletry
- Infrastructure posing a danger to animals such as any above-ground lines and pipelines □
Decommissioning including landscaping and restoration

1.3.2. Modifiers of levels of risk

Overall, impacts may increase or decrease the risk of species persistence through indirect or direct effects on population processes, chiefly as a result of alteration of habitat size, quality and cohesiveness, as well as alteration of key ecological processes, and secondarily by affecting the viability of individuals. The risk to persistence (i.e. the chances of local extinction) of populations, communities, species and habitats is higher if the following conditions exist:

- Species with restricted ranges (the more restricted its range, the higher the risk),
- Species with disjunctive distributions (i.e. a fragmented range),
- Species with small populations,
- Habitat specialist species (e.g. rock-loving lizards, frogs confined to marshes or its soil),
- Species depending on resources with a critical distribution in time or space (e.g. frogs depending on water being in ephemeral pans at expected times),
- Species with long generation times,
- Species that play a keystone role (e.g. trees providing structures and shelter for nesting),
- High-diversity habitats of limited extent (e.g. rocky ridges),
- Species or habitats that contribute greatly to ecosystem services (e.g. pollinators),
- Species or habitats that collectively contribute to ecosystem services (e.g. large mammals that are the subject of game farming and tourist hunters),
- Ecosystem services such as anti-erosion substrate-binding functions of grass, shrubs and trees, or water infiltration and subsequent storage functions by sandy soils, making it available to downstream users,
- Integrity of water supply to deep-rooted trees and the effects this has on soil moisture in general.

1.3.3. Possible impact mechanisms:

1.3.3.1 General impacts

Impacts by a mine on biodiversity may occur on three levels, all of which may interfere with either ecological process or structure, or both. The three mechanisms of impacts that are here considered, and some examples of each are:

1. **Direct (loss of organisms and habitat or access to habitats).** Example: Clearing of land and subsequent construction of roads usually completely destroy natural areas within the footprint of the road completely, and alter those immediately adjacent to it extensively. Organisms experience this as a direct loss of suitable habitat area and will thus decline in population size. The movement of large vertebrates to and from their grazing and water



resources can be interrupted by alteration of the physical environment and creation of obstructions on the surface of the land, and by conduct of certain types of activities, such as trucks frequently travelling on specific roads.

1. **Indirect (interference with spatial functional processes).** Example: Many organisms occur as a collection of sub-populations in fragmented habitats. Together these subpopulations are known as a "metapopulation". The scale on which this metapopulation is ecologically active is wider than the directly-affected area, potentially extending to the region. Such a metapopulation survives (is "stable" in ecological terminology) in the landscape because the colonisation and extinction rates for the habitat fragments cancel each other out. Two key requirements for metapopulation stability are i) unoccupied habitats to which dispersing individuals can move, and ii) some stable subpopulations in relatively large source areas that can rescue other ones from going extinct. Linear infrastructure can thus alter the probability of landscape-scale extinction, both by decreasing the number of potentially viable habitats, and by interfering with dispersal and colonisation processes. In other words, mining can have a subsequent impact on a species even if a habitat fragment is currently unoccupied by that species.
2. **Temporal (direct and indirect).** Example: An economically viable mining enterprise usually has a medium to long-term presence in the landscape, and is associated with a number of ancillary and support developments that can have their own long-term impacts. The fact that the impacting agent is present over a long period has a multiplier effect on the potential for impacts to occur, and may additionally interact with temporal processes to increase risk. For example, many species can survive a temporary loss of habitat, as long as habitat again becomes available for colonisation within one generation span. In such a case, population dynamics are only minimally to moderately altered. However, if the linear infrastructure is present beyond the generational interval of the species, its population dynamics are impacted much more fundamentally.

1.3.3.2 Specific potential impact mechanisms

1. Direct destruction of organisms
2. Loss of habitat
3. Disturbance of normal behaviour
4. Loss of resources (e.g. decrease in available groundwater)
5. Decreased population sizes
6. Decline in habitat quality (e.g. due to polluting or toxic substances)

1.4. Important biodiversity features

The following natural features are vital aspects of the ecosystem in the region and on the project site. These features are extremely important cogs in the ecosystem; without them the natural character of the area would be entirely lost. The converse is also true: if impacts to these aspects could be minimised or avoided, the structure and function of the ecosystem might be maintained (but not the 'natural character' as perceived by humans – a large mine on this plain will be difficult to hide). These biodiversity features may thus be keystone features and structures and should receive highest management priority. Impacts to them should be avoided or mitigated through intensive management, restoration or even, as a last resort, by biodiversity offsetting of:

- Rocky hills,



- Ephemeral pans,
- Large trees.

1.5. Impacts

Each table represents an analysis of an impact (or a few related impacts) that may occur to a biodiversity feature or function in response to a number of potential risk sources. Risk sources are here used as synonymous with impacting activities or agents.

The impacts were analysed, first in terms of the mechanisms through which it may occur (called “Nature of impact” in the table), and second in terms of the criteria in Table 2. Significance was assigned according to the Hacking Method (see Section 1.1.1). Mitigating actions as well as monitoring activities are suggested and each table also has a section wherein further management recommendations and relevant notes are provided.



IMPACT 1. Direct destruction of organisms and their habitats						
STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING						
SOURCE OF RISK: Clearing of land for pit, establishing waste dumps, tailings, buildings; construction of roads; excavation of borrow pits; use of roads by vehicles and machinery; blasting for mining						
Nature of impact	<input type="checkbox"/> Removal or killing of individual organisms during earth-moving activities and traffic affects: <ul style="list-style-type: none"> ○ Plants, particularly trees, some of them protected ○ Satellite fauna and flora of above-mentioned trees ○ Animals, especially reptiles and invertebrates, as a result of being struck by vehicles and machinery moving earth or using roads ○ Dormant organisms, such as frogs, outside their season of activity ○ Seeds and eggs, and their loss prevents establishment of the next generation ○ Nests of bird species of sensitive conservation status are destroyed, as are dens or crèches of mammals 					
Status	NEGATIVE					
Level of impact	Individual organisms or progeny					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	L	L	M	H	M
Mitigated	M	L	L	L	H	M



<p>Management of impact</p>	<ul style="list-style-type: none"> • Restrict the footprint of the construction site activities and of the mine to that shown and described in the EIA □ Where possible avoid loss of trees or other special organisms • Preferentially place infrastructure on the least sensitive habitats and where possible avoid areas or features of higher biodiversity sensitivity (such as ephemeral pans, rocky hills, calcrete hills, or clumps of trees), and keeping a variety of different habitats intact as much as possible. Avoid using ridges for placing water reservoirs, as these bear ecologically different structures. At least a 100 m wide boundary zone should be kept free of developments and mine-related activities around pans, effectively a no-go zone. • Specifically, the large ephemeral pan located east of the mine site should be avoided • Where possible avoid killing protected trees and develop plans to care for them during the life of mine until their surroundings have been restored • Avoid impacting nests, dens and crèches during the breeding season of species of special conservation status, or plan to translocate these if feasible; although this is usually not practical with bird nests (which are subsequently abandoned), it should nevertheless be attempted if there is no alternative (e.g. with eagles) following the advice of experts; the best is to avoid the vicinity of such nests until the chicks have fledged • If possible, avoid venturing outside the mining area to within closer than 1 km of nest sites of Lappet-Faced Vultures during life of mine • As much as possible and as is feasible, evacuate any animals of conservation significance from the mining area before disturbance
<p>IMPACT 1. Direct destruction of organisms and their habitats</p>	



	<ul style="list-style-type: none"> • Remove and stockpile topsoil, along with its soil fauna and seed banks, and devise plans for its management during stockpiling and redeployment for restoration • Remove other organic material, including litter and dead wood, and stockpile separately for future use in restoration, but avoid this becoming a fire hazard. Appropriate stockpiling methods should be investigated, and should promote the viability of the communities they contain. • Construction crews and mining staff should be held to the rule of staying inside the demarcated boundaries of the construction and mining site areas • Fence and/or earthen-bund the perimeter of the mining pit to reduce the chances of animals being destroyed by blasting, or incurring damage by mining equipment • Construct roads as narrow as operationally feasible and maintain all roads in good condition so that diversions off roads will not be necessary • Aggregate borrow pits for road construction should be sited on the likely mining site to reduce overburden stockpiling and unnecessary environmental disturbance. • Develop road use policy, including speed limits, and enforce this • Upon completing construction, initiate restoration of all roads and other sites that were only impacted during construction and will not be required for mining operation • Increase environmental awareness through training of key staff, including their ability to handle animals during evacuation • Rigorously police the construction crews' and mining staff's adherence to the rules and do not hesitate to invoke penalty clause/s
Monitoring	<input type="checkbox"/>
Additional recommendations and notes	<input type="checkbox"/> A permit is required for the removal or destruction of protected plant species (there are 13 such species).

<p>IMPACT 2. Direct loss of biodiversity due to poaching, other killing of animals and harvesting of plants</p>
<p>STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING</p>
<p>SOURCE OF RISK: Unusually high density of people gathered in area which previously had a low density of people</p>



Nature of impact	<ul style="list-style-type: none"> Mine staff and construction and decommissioning teams illicitly kill animals or plants or their products Many animals are poached for food, including: Livestock, game animals, other medium-sized mammals such as porcupine and pangolin, also hares, game birds, tortoises, leguaan, python, bullfrogs. Several of these are relatively rare (e.g. pangolin). Plants are collected as veld-food, sometimes applying harvesting methods that damage the surrounding environment Fruit or seed pod harvesting removes seeds from the environment and reduces plant recruitment Some protected trees, such as <i>Combretum imberbe</i> (leadwood), are illegally chopped down for furniture wood or charcoal □ Some animals are collected for medicine or pet trade, including: carnivores, certain reptiles, frogs. Carnivores are killed because they are thought to be a nuisance or dangerous. Snakes, whether dangerous or not, are killed because people fear them. Similarly with scorpions, large spiders and sunspiders. Collection of firewood removes an important element from the habitat, required by many animals and microorganisms that shelter in, or consume dead wood. Honey bees living in tree hollows or crevices are disturbed or robbed of their honey. 					
Status	NEGATIVE, POTENTIALLY CUMULATIVE					
Level of impact	Individual organisms					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	L	M	M	H	H
Mitigated	L	L	L	L	L	L
Management of impacts	<ul style="list-style-type: none"> Enclose the mining site with a game fence to wildlife out and people in Develop a policy that limits independent movements by staff into the veld outside the fenced-in mining site. Strictly prevent poaching and harvesting, including of firewood, or possession of any such natural materials. Enforce rules with “zero tolerance”. Provide or ensure that there is adequate food for workers on site. Allow only mining personnel, service providers and construction staff, as well as registered mine visitors on site. Construction/decommission teams, mine staff and service providers should not spend recreational time at the mine and its surroundings. Train all mine staff to appreciate the natural non-consumptive values of biodiversity, as well as legislation relating to protected species. Raise awareness concerning recognising venomous snakes from non-dangerous ones, and ensure that sufficient personnel are trained to handle snakes so as to move them away from the mine without killing. The same goes for dealing with invertebrates. 					
<p>IMPACT 2. Direct loss of biodiversity due to poaching, other killing of animals and harvesting of plants</p>						



	<ul style="list-style-type: none"> In general, where feasible, 'mosquito' screens should be installed on door and window openings to exclude flying insects from indoor working areas, where they will be trapped and attract predators. This is particularly important if an on-site kitchen and canteen area is planned. Personnel should be trained to manage the first aid treatment of snake bite, scorpion sting, spider bite, centipede sting, and wasp and honeybee sting; medical records of personnel concerning allergies and unusual susceptibility should be available. This safety management reduces unreasonable fear and unnecessary killing of animals that should be translocated alive, if possible. Compensate farmers for livestock losses, based on valid claims, as that makes the mine staff accountable for these losses, thereby reducing them.
Monitoring	<input type="checkbox"/> Monitor staff for possession of animal or plant parts
Additional recommendations and notes	<ul style="list-style-type: none"> As this is not a consequence of mining per se, this impact can be effectively reduced with good, strict measures, which will require constant vigilance and reinforcement for the duration of the life of mine Conflict must be avoided with the farming community's goal of giving prominence to wildlife and its conservation. Plans for housing staff off-site are noted, but this impact is particularly important during the construction and decommissioning stages when numerous people will be living on-site.

IMPACT 3. Road kills	
STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING	
SOURCE OF RISK: Trucks and other vehicles frequently use roads at the mine as well as public roads towards Opuwo, Kamanjab and beyond	
Nature of impact	<ul style="list-style-type: none"> All traffic incurs the risk of running over animals and injuring or killing them, especially large trucks which are not so easily able to manoeuvre to avoid such incidents. At night, there is a particularly high risk for vehicles to run over nocturnal animals that frequent the roads, such as nightjars, owls, geckos, hares and jackals. Many animals crossing the road at night get confused and disoriented by lights and may be unable to avoid being hit by trucks and cars. This includes species of sensitive conservation status, such as cheetah.
Status	NEGATIVE, POTENTIALLY CUMULATIVE
Level of impact	Individuals



Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	M	M	H	H
Mitigated	L	L	M	L	M	M
Management of impact	<ul style="list-style-type: none"> • Train all drivers of vehicles in the necessary procedures to maintain regulated speed. • Regular follow-up training must be done to instil appropriate vehicle control and a high degree of professional road conduct. • When mine-related driving is performed off the mine site, encounters of drivers with members of the public is a form of public relations by the mine, and this should avoid conflicts and present a highly competent and professional picture to the public concerning safety and care for risks to animals (and other road users) by traffic • Speed limits must be strictly enforced, including using speed-reducing methods and speed-monitoring devices. • As much as operationally feasible, driving to and from the mining sites should be avoided at night and limited, if possible, only to within the mining area. 					
Monitoring	<input type="checkbox"/> Record and report all incidents					
Additional recommendations and notes	<input type="checkbox"/>					

IMPACT 4. Direct and indirect effects on biodiversity due to the presence of humans, dust, noise, light, moisture, vibrations, artificial surface water
STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING
SOURCE OF RISK: Mine trucks; blasting; trucks and buses using the public road; other mine-related traffic; nocturnal illumination of the mining site for operations and security; dust-suppression using water; water on tailings dam; surface water from dewatering pit; presence and activities of people



Nature of impact	<ul style="list-style-type: none"> • Activities of people, equipment and mining cause constant disturbance, changing the behaviour and use of space by animals • Nesting birds are disturbed and may abandon nests, which should be avoided, if possible, particularly with the Red Listed vulnerable bird species (Tawny Eagle, Booted Eagle, Martial Eagle and Bateleur) • Reduction of plant photosynthesis by blocking sunlight through clouds of dust as well as the settled dust on surfaces, thereby reducing plant growth and viability, as well as affect insect herbivores and their predators • Pollinators may experience more difficulty in finding dusty flowers, thereby reducing pollinator populations as well as lowering fruit production • Animals experience respiratory problems and irritation to the eyes and other areas, which can potentially reduce their health • General activities at the mining site, especial noise, light and dust, interfere with navigation of behaviour of moving animals • Light at night disorients some animals, which waste their energy and are attracted to areas of low (or high) resources or that are hazardous or otherwise dangerous to them • Light at night attracts predators and scavengers which find these concentrations of prey • Scorpions and other venomous animals that are attracted to prey around light pose potential health and safety risks to employees • Mechanical vibrations disturb many animals, causing them to be unnecessarily hyperactive or disoriented, which may contribute to reduced health or energy depletion • Birds, insects and other animals that are attracted to water on tailings facilities and water spraying for dust-suppression may experience hazardous conditions from moving equipment or unhealthy, contaminated water • If uncontaminated water is produced as a by-product of this development, it can also be beneficial drinking water to some organisms • Malaria mosquitos (<i>Anopheles</i>) may breed in water pools and transmit malaria, although this is a moderately low risk at ML 249 					
Status	NEGATIVE, POTENTIALLY CUMULATIVE					
Level of impact	Individuals and Populations					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	L	M	M	M	M
Mitigated	L	L	L	L	L	L
Management of impact	<ul style="list-style-type: none"> • At any time, confine mining-related activities to as small an area as possible. • Reduce dust by following recommendation concerning dust control; see Air Quality Report. 					
<p>IMPACT 4. Direct and indirect effects on biodiversity due to the presence of humans, dust, noise, light, moisture, vibrations, artificial surface water</p>						



	<ul style="list-style-type: none"> • As much as possible minimise the amount of surface water on tailings or other areas. • Avoid unnecessary noise and reduce volume of noise levels as much as possible • Reduce fixed outdoor lights to the minimum that is compatible with operational effectiveness and safety. • Where appropriate, use motion detectors, time switches or similar to only supply light when needed. • Use yellow outdoor lights (sodium vapour floodlights with orange covers, or yellow bulbs/tubes for incandescent and fluorescent lights) wherever possible as this is less glaring to invertebrates while serving human requirements. • Reduce the attraction to invertebrates to indoor lights by installing self-closing doors and non-opening windows in night-time operations buildings. • If automated, UV-attractant pest management devices have to be deployed, such systems should be either kept indoors (e.g. in maintenance sheds, inside administrative blocks, or inside production plants) or should be covered with wire mesh to ensure that only target organisms of the right size are electrocuted. • Purify water that is produced to potable quality, which is not unhealthy for animals to drink • Fence in tailings facilities and other areas that are regularly artificially wetted and use other proven means to deter birds from reaching them; wetted areas should be kept to a minimum
Monitoring	<input type="checkbox"/> Monitor levels of dust, noise, light and humidity
Additional recommendations and notes	<input type="checkbox"/> Given that this impact is tied to many activities at the mine, it is uncertain whether the probability can be reduced to LOW through mitigation, although this should be the target

<p>IMPACT 5. Direct and indirect effects of chemical pollution, waste oil, rubbish, faeces</p>
<p>STAGE: OPERATIONAL</p>
<p>SOURCE OF RISK: Solid, liquid and gaseous emissions from the leaching process, tailings, mining equipment, bulldozers and trucks; rubbish generated by the operations and personnel; waste water management facilities; illicit placement of faeces in the field</p>



Nature of impact	<ul style="list-style-type: none"> Inappropriate disposal or transmission of hazardous chemicals materials in the veld or on the topsoil may affect soil organisms or any one or more of a range of animal species and may accumulate, potentially for a long time The health of many organisms may be reduced by chemical pollutants Rubbish can be unsightly and unsanitary. Insects and reptiles are trapped inside tins, bottles, plastic containers and other rubbish. Use of veld as toilet by workers may affect health of predators and other animals, and diseases can spread to humans Spillage of fuels or other hydrocarbons during operation or maintenance of machinery may impact soil organisms Waste materials containing high levels of heavy metals may be toxic to plants and animals Animals frequenting the tailings facilities are contaminated, which represents health risks and increased the potential of spreading pollutants Given the high water infiltration rates of soil at ML 249, surface contaminants, including contaminated water and sewerage can quickly infiltrates into the ground and may reach the groundwater, especially in the vicinity of ML 249 pan; this would affect phreatophytic trees and the quality of water abstracted from boreholes, and affect all wild and domestic animals (and humans) who drink from it 					
Status	NEGATIVE					
Level of impact	Habitats, populations, individuals					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	H	H	M	H	M	H
Mitigated	L	L	L	L	L	L
Management	<ul style="list-style-type: none"> All chemicals, emissions, and leaching products as well as tailings must be strictly contained and regularly timely cleaned or neutralised, adhering to best practises Develop waste policy and actively enforce it Develop policy for the management of hazardous materials and actively enforce it Provide temporary waste deposition facilities on site (rubbish bins, skips), which are secure from scavengers, storms, or other disturbance Safely transport hazardous waste to the designated facility in Walvis Bay, abiding by strict standards of handling and transport □ Transport all general waste to well-managed municipal waste dump site Provide adequate toilet facilities for all workers at work sites and enforce a strict policy of not defecating in the field 					
IMPACT 5.	Direct and indirect effects of chemical pollution, waste oil, rubbish, faeces					



	<ul style="list-style-type: none"> Apply appropriate hydrocarbon-handling principles (storage tanks should have bunding and be regularly inspected, lubricants should be stored in properly designated and appointed facilities, spillages should be cleaned up immediately, adequate control over use of fuels) Minimise as much as practically possible moistening of tailings to reduce attraction to insects and birds and avoid consequent contamination or direct damage to these animals from mining machinery or earthworks; fence in these mine facilities to prevent wildlife from reaching them Contain all contaminated water and purify it to potable quality before reuse, or release into the environment
Monitoring	<ul style="list-style-type: none"> Monitor area adjacent to mining sites for mining-related chemicals and pollutants, discarded waste and human waste Monitor handling of hydrocarbons and any other hazardous wastes in light of appropriate and relevant principles Monitor groundwater and soil conditions for signs of pollutants, following guidelines developed for this mine's conditions
Additional recommendations and notes	<ul style="list-style-type: none"> The outline of the biodiversity impact does not include the secondary and tertiary effects of pollution of the environment by carbon emissions, all of which may also eventually have an effect on biodiversity properties. The assumption that all aspects of the impacts can become LOW is based on the knowledge that the entire processes are fully controllable and can in principle therefore all be considerably reduced through strict management and putting the mitigation plans effectively into practise

IMPACT 6. Indirect effects on biodiversity due to lowering of groundwater table						
STAGE: OPERATIONAL						
SOURCE OF RISK: Extraction of water to use for mining activities; mine pit penetrating deeper than the natural ground water table						
Nature of impact	<ul style="list-style-type: none"> Phreatophytic trees that are connected to the ground water may dehydrate and die. Satellite fauna and flora and other ecologically beneficial effects of trees will also disappear. Water points on farms, on which wild mammals and birds also depend, become more difficult to replenish. 					
Status	NEGATIVE					
Level of impact	Populations					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance



Unmitigated	M	H	L	M	L	M
Mitigated	L	L	L	L	L	L
Management of impacts	<ul style="list-style-type: none"> Minimise water abstraction other than dewatering of the pit by reducing the mine’s water requirements as much as possible Where possible, undertake measures to minimise the area of aquifer that is drained If tree condition declines, investigate measures to improve it without abstracting more water Investigate possibilities for offsetting significant tree mortalities During mining operations it may become necessary to extract excess water from the open-cast pit. Water extracted in the process can either be used to recharge aquifers. 					
Monitoring	<ul style="list-style-type: none"> Monitor groundwater levels in boreholes on an on-going basis Annually record health condition of a sample of large trees throughout the life of mine in a reasonable radius (i.e. a radius that reflects the outcome of hydrogeological modelling studies) around the mine pit Should there be a significant decline in health or increase in mortalities that can be linked to groundwater changes, a detailed action plan should be drafted that will define and refine further mitigation options. Should there be no mitigation options, biodiversity offsets should be considered. 					
Additional recommendations and notes	□					

IMPACT 7. Indirect loss of local biodiversity due to loss of habitats, fragmentation of habitats or detrimental effects of introduced invasive species
STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING
SOURCE OF RISK: Location of infrastructure and disturbance due to mining activities and use of roads



Nature of impact	<ul style="list-style-type: none"> Loss of trees reduces populations of many other species Grazing and browsing areas for large herbivores are either destroyed or fencing prevents access Animals have less space and associated resources, e.g. grazing and browsing by large herbivores, hunting grounds by large carnivores such as cheetah Changes in surface water flow may change normal hydrological pattern in ephemeral pans and isolate or dry out previously interconnected wet areas Population dynamics change due to population fragmentation following habitat fragmentation, especially due to linear infrastructure which blocks movements or increases risks Invasive species arrive with material brought to the site and spread, to the detriment of indigenous species 					
Status	NEGATIVE, POTENTIALLY CUMULATIVE					
Level of impact	Populations					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	H	L	M	M	M
Mitigated	L	M	L	L	M	M
Management of impact	<ul style="list-style-type: none"> Where possible, avoid destroying trees or disturbing their proximity, so that animals can continue to use them. Fence and/or earthen-bund the smallest possible operational mining area to allow access to grazing on areas not subjected to mining Avoid placing waste rock dumps, tailings, or any embankments (e.g. roads) in the way of water surface flow or install culverts and drains to retain drainage so as to keep the natural surface hydrology such that ephemeral pans do not experience hydrological changes. Locate linear infrastructure in a way that minimises new fragmentation, e.g. using infrastructure corridors Where possible, bury water supply pipes outside the mine site where they cross open country, particularly where wildlife cross Rehabilitate areas around linear infrastructure after installing it such that they minimise habitat fragmentation, allowing populations to be connected across them, e.g. rehabilitate tracks used to install power lines, put water pipes underground and rehabilitate tracks. Develop and enforce traffic control measures to minimise continuous disturbance of wildlife. Implementing strict controls over the movement of materials onto and off the site to minimise the spread of invasive species; if this becomes a problem, expert advice should be obtained concerning 					
Monitoring	<input type="checkbox"/> An expert study on the effects of the mine and its related activities on the cheetah population should be conducted, specifically focusing on those cheetahs whose home ranges are within an area of about 25 km of the mine; the study should determine how					



IMPACT 7. Indirect loss of local biodiversity due to loss of habitats, fragmentation of habitats or detrimental effects of introduced invasive species	
	<p>mining activities affect the movements and local population of cheetahs</p> <p><input type="checkbox"/> Monitor the occurrence and spread of invasive species so as to instigate steps for their control, following expert advice</p>
Additional recommendations and notes	<p><input type="checkbox"/> Significance remains MEDIUM even after mitigation, because the probability is inherently associated with the mine and it is uncertain whether that can be effectively reduced to LOW, except with exceptional effort and high standards very strictly adhered to (e.g. quarantine all materials brought to the mine); some fencing and other linear infrastructure are part of the mine, and they fragment the landscape</p>



IMPACT 8. Direct impacts on birds due to collision with and electrocution by on-site electrical structures						
STAGE: OPERATIONAL						
SOURCE OF RISK: operation of high-voltage electricity structures between						
Nature of impact	<ul style="list-style-type: none"> Some kinds of birds do not see wires when flying and collide with them. All wires associated with power lines, including electric wires, stay wires, optical fibre cables, and earth wires are therefore potential obstructions. When individual birds make contact with live electricity conducting structures, they may bridge the gap between live components and/or other live and grounded components and cause a short circuit and electrocute the birds. □ Birds can cause electrical faults to power facilities □ Bird species likely to collide: <ul style="list-style-type: none"> Power lines: waterfowl, geese, waders, owls, korhaans, Kori Bustard, (if this is in a flamingos flight path, then they are susceptible) Stay wires: Ostrich, korhaans, sandgrouse □ Bird species likely to be electrocuted: <ul style="list-style-type: none"> Power lines: eagles, vultures, crows, vultures, Helmeted Guineafowl Transformers, switch-gear structures: owls, possibly starlings 					
Status	NEGATIVE, POSSIBLY CUMULATIVE					
Level of impact	Individual birds					
Mitigation	Severity	Duration	Spatial Scale	Consequence	Probability of Occurrence	Significance
Unmitigated	M	M	L	M	M	M
Mitigated	L	L	L	L	L	L



<p>Management of impact</p>	<ul style="list-style-type: none"> • Power lines should be routed away from clumps of trees and wetlands, where possible • Install 'Raptor Protectors' on all insulators in the vicinity of potential roosting or nesting areas, particularly of Lappet-Faced Vultures • The single wooden pole 'A-frame' design should be used instead of the 'H-pole' design <ul style="list-style-type: none"> ○ Use a minimum of stay wires necessary, and mark them with white and red spiral vibration dampers ○ Clearance distance between adjacent electrical points should be further than the largest birds' wingspans or tip of toe to tip of beak distance ○ Earth wires should have sufficient safety gaps to avoid being permanently active (though still effective as lighting conductors) ○ Where the line crosses bird flight paths, mark the top conductors red double flight diverters (and if it is a flamingo flight path, also mark it with SpanLite self-illuminating warning spheres or solar powered LED lights and)
<p>Monitoring</p>	<p><input type="checkbox"/> Regularly patrol all project power facilities once a month and more frequently if problems are detected</p>
<p>IMPACT 8. Direct impacts on birds due to collision with and electrocution by on-site electrical structures</p>	
	<ul style="list-style-type: none"> • Record the causes, position and other details of outages • Record bird mortalities on a standardized form, with the GPS/electrical facility number and other details, and photographs of the carcass, structure and general habitat; forward a copy of each report to the NamPower/NNF Strategic Partnership for further investigation (this partnership monitors all power-related incidents, not only on NamPower facilities) • Establish whether or not this site is in a flamingo flight-path, and if it is, follow the appropriate mitigation procedures as recommended by the NamPower/NNF Strategic Partnership
<p>Additional recommendations and notes</p>	<ul style="list-style-type: none"> • It is assumed that power lines during construction will not be any major new structures (taken off the existing homestead supply) • The significance of this impact is not rated high because the mine's specific infrastructure appears to be short • A separate BIA should be conducted for the entire power line and other electrical structures if they are upgraded as result of this project

2. SUMMARY AND RECOMMENDATIONS

2.1 Impacts summary and discussion

Impacts are summarised in Table 3, where the significance of each impact is given, as well as their potential significance after mitigation.

The most obvious impact is the clearing of land and direct destruction of biodiversity at the mine site. Farming and fencing has already transformed the land and affected biodiversity to some extent. Overall, in the case of the proposed ML 249 Copper Mine Project, direct destruction of biodiversity by clearing land is regarded to be of medium significance. The one exception to this is the removal of large trees, particularly *Combretum imberbe* and *Acacia erioloba*, protected keystone species which are important for other flora and fauna.

Similarly, loss of habitat and habitat fragmentation is not thought to be of high significance, partly because some of the habitat has already been degraded around the mine site, and some kinds of disturbing infrastructure are already in place, e.g. fencing and roads. Any changes of surface hydrology in areas near the mine will affect water availability in depressions and pans, but surface hydrology is currently not considered to be important in the area.

A host of effects relating to mining activities, namely, dust, noise, light, moisture, artificial surface water and human presence will likewise compromise the use of the area by animals. It will be possible to mitigate them and to strictly control some of them, such as reduction of light, dust, noise, and artificial open water, but all these impacts are part and parcel of mining, and can only really be limited by keeping them as short in duration as possible, on a daily, annual and life-of-mine scale. The impacts of chemical pollution and the generation of waste are potentially very high but can and should be minimised by effective management and strict controls. These, too, are part and parcel of the mining process, and the impacts should be kept very brief and confined to local space. All toxic or otherwise hazardous materials should be kept confined at all times.

Heavy traffic by heavy trucks will be a main feature of this mine, and in this regard the risk of road kills will be a constant danger to animals on roads for the duration of mining. Safe driving will greatly reduce this risk. The planned mine pit could affect the groundwater conditions in the area if water drains into the pits and needs to be pumped out. The main problem for biodiversity would be the potential loss of phreatophytic trees, which are important features. It will also possibly reduce the ability of farmers providing artificial water points, which are used by many game and bird species. This impact can be managed and reduced in spatial scale by minimising use of water and reusing water obtained from dewatering the pit.

The potential for poaching and collecting of plants and wood is possibly one of the highest potential impacts of bringing so many people to this area. The risk of poaching and harvesting would be especially acute if workers were to reside uncontrolled in the area and can wander into the field unaccompanied in their free time. This potential threat can be considerably reduced by locating housing well away from the mine, and by strictly controlling personnel on site. Not only are vulnerable taxa important from a biodiversity perspective, but populations of many plants and animals and of entire animal and plant communities/assemblages can be considerably affected by illicit consumptive practises of mine workers, if these are not effectively controlled.

Although the new electrical power supply lines to be installed for this mine appear to be rather short additions to existing lines, this is a potentially cumulative impact, and may result in additional infrastructure being built by NamPower. It is recommended that this infrastructure be subject to a separate BIA/EMP. Several species of large birds are potentially at risk of collision or electrocution

with power lines and other electrical structures and these will require specific mitigation measures, e.g. as recommended by the NNF/NamPower Strategic Partnership. By becoming a major user of power in the area, the ML 249 Copper Mine Project should take on a good share of collective responsibility for this feature.

Table 3. Summary of impact significance of the ML 249 Copper Mine project

Impact ratings in the “WITHOUT mitigation” column in cursive text were increased from the calculated rating, for reasons explained in each respective impact statement above. Ratings of impacts “WITH mitigation” are subjective assessments.

IMPACT	Priority	Impact WITHOUT mitigation	Impact WITH mitigation	Cumulative impacts Y/N
IMPACT 2. Direct loss of biodiversity due to poaching, other killing of animals and harvesting of plants	1	HIGH	LOW ¹	Y
IMPACT 3. Road kills	1	HIGH	MEDIUM	Y
IMPACT 4. Direct and indirect effects on biodiversity due to the presence of humans, dust, noise, light, moisture, vibrations, artificial surface water	1	MEDIUM	LOW	Y
IMPACT 7. Indirect loss of local biodiversity due to loss of habitats, fragmentation of habitats or detrimental effects of introduced invasive species	1	HIGH	MEDIUM	Y
IMPACT 8. Direct impacts on birds due to collision with and electrocution by electrical structures	1	MEDIUM	LOW ²	Y
IMPACT 5. Direct and indirect effects of chemical pollution, waste oil, rubbish, faeces	1	HIGH	LOW	N
IMPACT 1. Direct destruction of organisms and their habitats	2	MEDIUM	MEDIUM	N
IMPACT 6. Indirect effects on biodiversity due to lowering of groundwater table	3	MEDIUM	LOW ³	N

¹ This assumes that **all** suggested mitigations are followed ²
This assumes that a) power lines will be below ground, b) all other possible recommendations are followed, and c) a separate assessment will determine which specific mitigations should be followed. ³
There is uncertainty about the effects of water extraction on plant health, as well as uncertainty of the groundwater dynamics in the area Page

2.2 Management recommendations

- Apart from specific recommendations provided in the impact tables, some general, crosscutting recommendations for the design, construction, operation and closure of the mine are:
 - Commit to a policy of zero net loss of biodiversity as a guiding principle for management of impacts
 - Minimise the footprint size of the mine
 - Avoid where practical removal of large trees, particularly the protected species
 - Minimise dust, noise, light, artificial surface water, pollution, spreading of waste, and limit human presence to as small an area as possible
 - Strictly manage hazardous waste
 - Manage traffic to be safe for animals and humans at all times
 - Provide adequate training for drivers
 - As much as possible, avoid driving to and from the mine at night
 - Minimise the lowering of the water table following measures outlined in other studies
 - Implement policies to avoid all killing/collection of animals, plants and burning of wood
 - Implement measures to reduce collisions and electrocution of birds at power facilities
 - Develop an action plan should any of the mining-related developments encroach on permanent or ephemeral wetlands. Such an action plan must define and refine possible mitigation or offset responses.
 - A 100m exclusion zone should be committed to around all non-impacted pans, and this should be treated as a No-go zone

2.3 Recommendations for further study

- The entire area is not classified as an area of high biodiversity sensitivity, and should be seen in the context of the extensive surrounding area of similar nature. There is therefore some motivation not to conduct detailed long-term studies of all aspects of the biodiversity. The baseline studies did not include more detailed assessments of relative or absolute population sizes because all other assessments that were conducted indicated that it was not warranted to do so.
- It is recommended that a special study investigate the use of space of the area of the cheetah population, given the relative sensitivity and conservation importance of this species in this area.
- Uncertainty equals higher risk, with the result that the current BIA has produced a relatively high proportion of highly significant potential impacts. These can be lowered effectively through mitigation, and if these are incorporated into the implementation plan, this BIA should lead to an improved EMP and thus a better chance of project approval by the environmental regulator. It is our opinion that such an EMP will need review and revision through the re-evaluation of each impact and mitigation measure once more information is available.
- Several factors should be monitored, some starting before mining commences, and these will help to adjust and improve the EMP with time.

**AIR QUALITY AND NOISE ENVIRONMENTAL IMPACT
ASSESSMENT REPORT FOR THE DEVELOPMENT OF
CUPPER MINING ACTIVITIES ON A MINING LICENSE
(ML 249), KUNENE REGION**



By: Ms Ndapandula Shatona
(Radiation Physicist)

EXECUTIVE SUMMARY

The proponent, Shiloam Mining and Investments (Pty) Ltd, applied for a copper ore mining licence with the Ministry of Mines and Energy. The main objective of this EIA is to determine the potential impact of dust emissions and noise pollutions from the mine on the surrounding air and noise quality.

Meteorological data for Kunene region and Opuwo town were obtained for an initial baseline assessment. The potential impact of dust emissions and ambient noise pollution from the proposed mining activity on the surrounding environment were estimated using various literature reviews of similar open pit copper ore mining. Comparison with international ambient air quality and noise standards was made to determine compliance in terms of potential health impacts.

Kunene region has a good air quality, whereas the Opuwo town has a moderate a quality. However, there are no notable negative environmental impacts on the proposed mining site and its environs with respect to dust deposition resulted from exploration.

Studies finding showed that dust particles are generated in copious amount in mining processes, and can be inhaled. Most worrisome, is that some particulate matter can remain airborne for a long time owing to the dry in-land air characteristic of much of Namibia. Common effects of air pollution include changes in heart and lung functions with increases in associated medical conditions such as asthma, bronchitis, and heart disease. Noise pollution studies from mining activities have been carried and result reveals that noise levels are comparatively higher in the active zones like drilling, blasting and mining service stations truck transport, tractor-trolley transport and heavy machinery like the used of shovels and compressors equally contributes to noise generation beyond the limits of tolerant. The study found the noise level ranging from 96-125 dB. Obviously, these values are above the recommended limits of 75 dB (WHO) for day time industrial area.

Summary of the project mitigation measures on Noise and Air pollution

Impact	Mitigation Measures
Noise pollution	<ul style="list-style-type: none">• Drilling and blasting activities should be limited to reasonable hours during the day and early evening.• Equipment and machinery should be equipped with mufflers and be properly maintained to minimize noise.• Vehicles should be restricted to a slower speed limit• Transportation routes and delivery schedules should be planned during detailed design• Proper PPE will be provided to workers to meet the requirements in occupational exposure limits.

	<ul style="list-style-type: none"> • Conducting of noise measurements and monitoring from different prevailing noise levels and recommending appropriate mitigation measures.
Increased air pollution	<ul style="list-style-type: none"> • sprinkling water technique will be used to suppress dust particles from the atmosphere • Restricted speed limit of trucks and vehicles on the mine and community roads • Road surfaces should be sprayed with water and compacted. • Proper PPE will be provided to workers to meet the requirements in occupational exposure limits.

Conclusion

Noise pollution and dust deposition are major component of all mining activities. The development of the project is considered beneficial to the immediate community and the country at large. The concerns of environmental deterioration of air quality and noise pollution can be addressed through close follow-up and implementation of the recommended Environmental Management and Monitoring Plans.

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1. INTRODUCTION

The proponent, Shiloam Mining and Investments (Pty) Ltd, applied for a copper ore mining licence with the Ministry of Mines and Energy. The proposed mining area is located 40 km northeast of Opuwo, along the C35 road in the Kunene region. The size of the mining licence is 7647 hectares and the coordinates for the centre of the mining licence is 14°8'47.064"E and 17°44'20.785"S.

This EIA evaluates the likely air quality impacts associated with the operational phase of the project, including both positive and negative impacts that the proposed mining project undertaking is likely to have on the environment. This EIA identify possible impacts will engenders environmental sustainability to which end, anthropogenic factors such as dust deposition and noise generation will not interfere with ambient natural environment. This study is an important planning tool for the project proponent since it will provide any notable project impacts and clearly define mitigation measures to keep the environment safe from any adverse impacts.

1.1. Terms of Reference

The terms of reference for the preparation of this EIA Report are:

- || An in-depth look into project objectives and location of the site.
- || To provide a baseline information on dust deposition, noise pollution and any other relevant information related to the project.
- || Description, evaluation and analysis of the foreseeable potential noise and dust environmental effects of the project which is classified as direct, indirect, cumulative, irreversible, short-term and long-term effects.
- || To develop an Environmental Management Plan (EMP) by proposing effective measures for eliminating/minimizing or mitigating adverse impacts on the environment.

Environmental impact assessment considers the following.

- || Description of the project including baseline information.
- || Desk top review of relevant literatures,
- || A review of the policy, legal and institutional framework.
- || Assessment of the potential air quality and noise Environmental Impacts of the project on the project area.

1.2. Project Location and Description

The proposed mining area is located 40 km northeast of Opuwo, along the C35 road in the Kunene region. The size of the mining licence is 7647 hectares and the coordinates for the centre of the mining licence is $14^{\circ}8'47.064''\text{E}$ and $17^{\circ}44'20.785''\text{S}$.

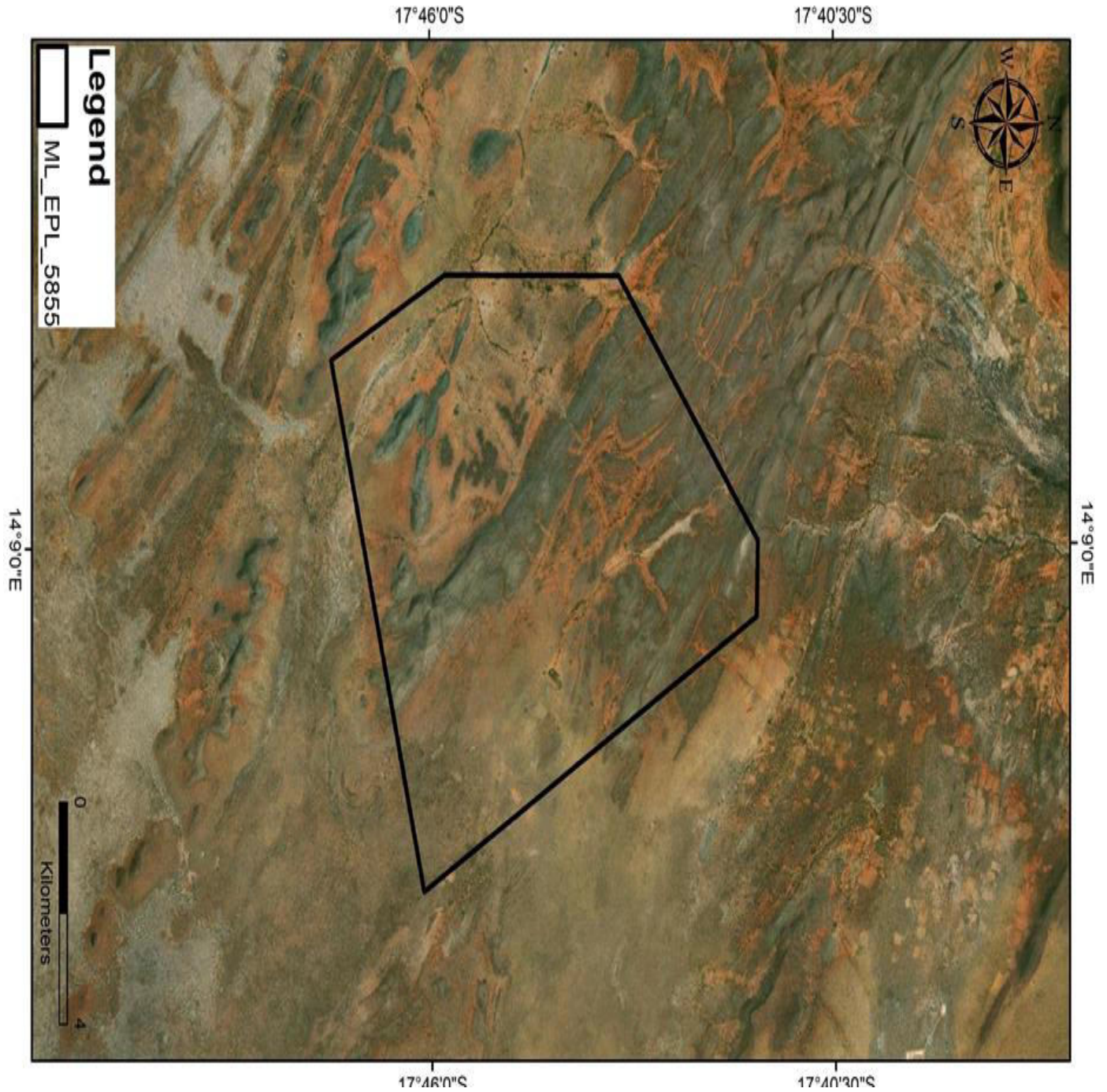


Figure 1. Proposed mining boundary.

The proposed project will primarily mine copper through open pit mining. Open pit mining is the most widely used technique to extract copper ore near the earth's surface. It is accomplished by creating and using benches or terraces to gradually reach deeper under the earth's surface, while dumping overburden and tailings (waste) at a specified disposal site outside the final pit boundary. Open pit method is usually nonselective, and it includes all high and low-grade zones; whereas mining rate is nearly over 20,000 tons mined per day and often necessitates a large capital investment but generally results in high productivity, low operating cost, and good safety conditions various earth-moving equipment including shovels, dozers, hauling trucks, and loaders are used to remove and transport the ore. However, the first step is to loosen the rock in the ore body so that it can be moved and processed. Blasting and grinding equipment are used to accomplish this task.

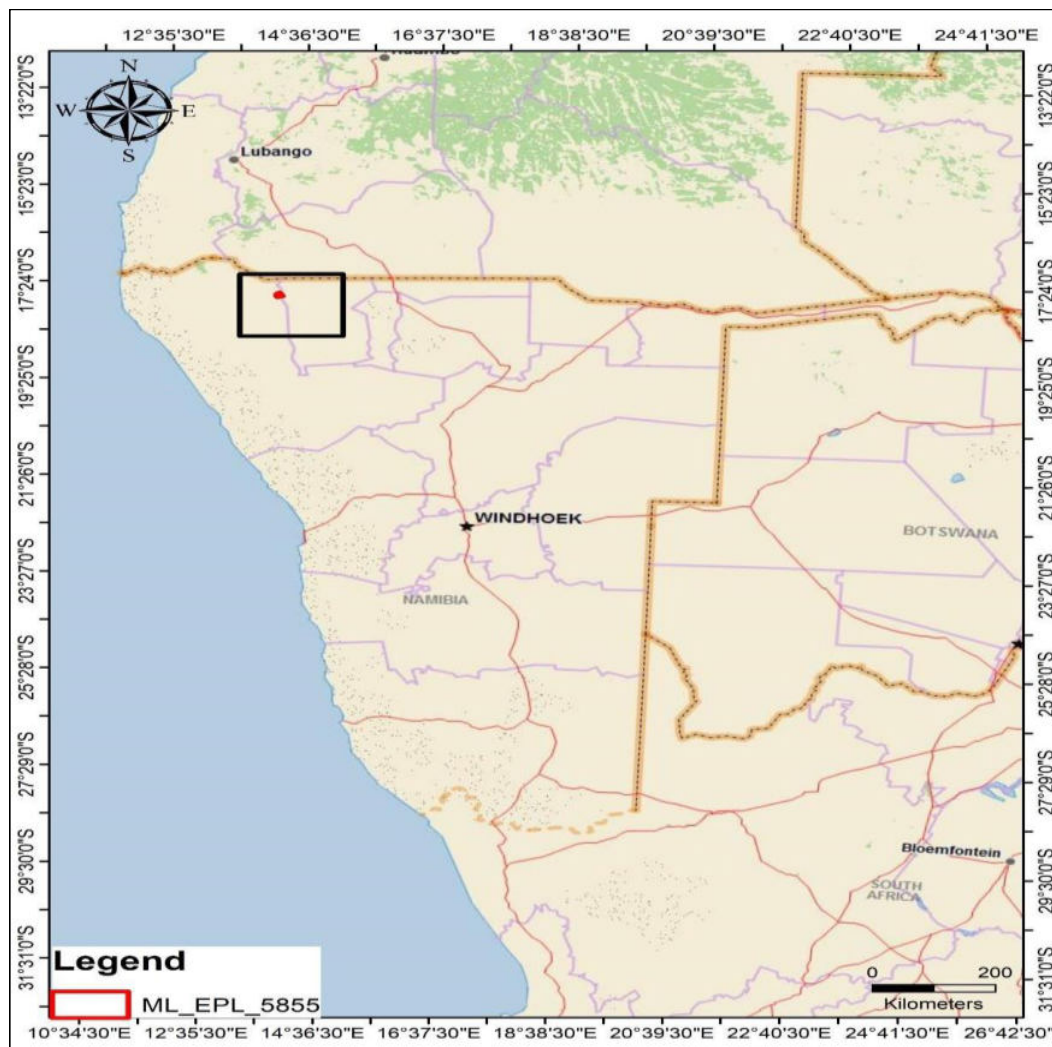


Figure 2. Locality map of the Mining licence area

2. APPROACH AND METHODOLOGY

- A brief overview of the study methodology is included in this section.
- A review of information on a Broad overview of typical noise and air emissions from mining and ore processing activities.
- The Identification of Regulatory Requirements and Health Thresholds. Noise and Air quality requirements and assessment criteria were identified through the careful review of:
 - The Namibian Atmospheric Pollution Prevention Ordinance (NPPO) (No. 11 of 1976);
 - Environmental Impact Assessment under act no 7 of 2007,
 - World Health Organization (WHO) ambient air quality criteria;

- Status and expected levels of Dust and Noise Emissions Estimation at the proposed mining area
Physical environmental parameters that influence noise and the dispersion of pollutants in the atmosphere include land cover and meteorology. Existing ambient air quality in the studies were considered.

- Anticipated Impacts and Mitigation Measures

The establishment of a comprehensive emission inventory formed the basis for the assessment of the air quality and noise impacts from the mine's emissions on the receiving environment. In the quantification of emissions, use was made of emission factors which associate the quantity of a pollutant to the activity associated with the release of that pollutant.

- Qualitative Impact Significance Rating
- The Development of an Air Quality Monitoring Plan

The findings of the above components informed recommendations of air quality management measures, including mitigation and monitoring.

3. METHODS AND DESK TOP REVIEWING OF RELEVANT LITERATURES,

Various literatures were used in aiding the successful completion of the report and meteorogram report of Opuwo town was obtained for the meteorological conditions of wind direction, wind speed and temperature respectively.

3.1 Broad overview of typical noise and air emissions from mining and ore processing activities

Mining is an important economic activity in many countries around the globe. Namibia is rich in mineral deposits, minerals like copper, gold, uranium, zinc, lead, lithium etc. abound in Namibia. Emissions of dust and noise can produce a significant environmental impact from the mining industry during all operations related to surface mining, mineral processing, and waste dumping. The contemporary approach to noise and dust emission management in mines includes an understanding of source types, utilization of efficient and contemporary mitigation measures and application of experiences and best practice in noise and dust management for the reduction of their emission to a level below limiting values (Lilic et al., 2018).

In previous studies carried out in the Erongo region (SEA, 2010) it was identified that dust affects air quality in no small measure. The finding showed that dust particles are generated in copious amount in mining processes, and can be inhaled. Most worrisome, is that some particulate matter can remain airborne for a long time owing to the dry in-land air characteristic of much of Namibia. Recent scientific research has drawn strong links between air pollution and adverse health, particularly in susceptible parts of the community which include children, the elderly and sick. Common effects of air pollution include changes in heart and lung functions with increases in associated medical conditions such as asthma, bronchitis, and heart disease.

Studies of noise pollution from mining activities have been carried out in places such as the Indian and South Africa. In the Indian subcontinent measurement of noise pollution in mining development and environment in Bijolia mining area, Rajasthan, India were undertaken by Chauhan (2010). The result reveals that noise levels are comparatively higher in the active zones like drilling, blasting and mining service stations which are intermittent in nature and form point sources only. Also, truck transport, tractor-trolley transport and heavy machinery like the used of shovels and compressors equally contributes to noise generation beyond the limits of tolerant. The study measured noise level using a digital decibel meter and found the noise level ranging from 96-125 dB.

Obviously, these values are above the recommended limits of 75 dB (WHO) for day time industrial area.

Similarly, an environmental impact noise assessment was done in South Africa in 2013, which focused on ambient sound levels were measured at 7 locations during a site visit 2 – 5 July 2013 using equipment and methodologies as defined in SANS 10103:2008. Measurements indicated significant variation in equivalent sound levels from location to location, with all locations experiencing noisy single events at times that impacted on the sound levels. LA90 levels however indicate an area with significant potential to be quiet at times. The findings hold that due to economic advantages, mining provide valuable employment, local taxes and foreign currency. However, when mining projects are near to potential noise-sensitive receptors, consideration must be given to ensuring a compatible co-existence. The potential sensitive receptors should not be adversely affected and yet, at the same time mining need to reach an optimal scale in terms of layout and production. It should be noted that this does not suggest that the sound from the mining activities should not be audible under all circumstances - this is an unrealistic expectation that is not required or expected from any other agricultural, commercial, industrial or transportation related noise source – but rather that the sound due to the mining activities should be at a reasonable level in relation to the ambient sound levels (ENIA, 2013).

4. NOISE AND AIR QUALITY REGULATION AND STANDARDS

4.1 Noise regulation:

There are international guidelines regarding noise pollution, such as the World Health Organization (WHO) and Organization for Economic Coordination and Development (OECD) have come up with guidelines for the management of noise pollution e.g. the WHO Environmental Noise Guidelines for The European Region which concentrated on environmental noise originating from various sources such as transportation noise, wind turbine noise and leisure noise. The WHO has recommended an average value of 55 dB (A) for day time noise level and 45 dB (A) for night time noise level. Equally, the organization came up with ambient noise level for different facets of the human environment. The table below presents WHO guidelines for ambient sound levels.

Table 1: WHO Allowed limits for Ambient Sound Levels (WHO, 1999)

Locations	Ambient Sound Level L_{Aeq} (dB (A))			
	Day-time		Night-time	
	Indoor	Outdoor	Indoor	Outdoor
Dwellings	50	55	-	-
Bedrooms	-	-	30	45

Schools	35	55	-	-
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Similarly, the World Bank Group (WBG) International Finance Corporation (IFC) also looked at ways of managing pollution in developing countries where the institution is involved in its financing projects. Some of the guidelines proposed are listed in Table 2 below:

Table 2: World Bank/IFC Ambient Noise Guidelines (WHO, 1999; WBG, 1998)

Receptor	Maximum Permissible Ambient Noise Levels	
	1-hour L_{Aeq} (dB(A))	
	Day 07:00 - 22:00	Night 22:00 - 07:00
Residential, institution, educational,	55	45
Industrial, commercial	70	70

Note: No L_{Aeq} values assigned for rural areas.

Some countries have also legislature for noise pollution. We shall be looking at the Ambient Air Quality Standards in respect of noise for India and South Africa. Table 3 and 4 provides the noise standards for India and South Africa.

Table 3: The noise pollution directive and control guidelines, recommended by the CPCB, India (CPCB, 2010)

Area Code	Category of Area/Zone	Limits in dB(A) L_{eq} *	
		Day Time	Night Time
(A)	Industrial area	75	70
(B)	Commercial area	65	55
(C)	Residential area	55	45
(D)	Silence Zone	50	40

*Day time means from 6.00 am to 10.00 pm. *Night time means from 10.00 pm to 6.00 am. *Silence zone is an area comprising not less than 100 meters around hospitals, educational institutions, courts, religious places or any other area which is declared as such by the competent authority. *Mixed categories of areas may be declared as one of the four above mentioned categories by the competent authority.

Note: dB(A) L_{eq} denotes the time weighted average of the level of sound in decibels on scale A which is relatable to human hearing.

The SANS typical rating levels for ambient noise levels recommendation for districts are presented in Table 4 below:

Table 4: Typical Rating Levels for Ambient Noise for South Africa.

	Equivalent continuous rating level ($L_{Req,T}$) for noise (dB(A))
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Type of district	Outdoors			Indoors, with open windows		
	Day-night L _{R,dn} ¹⁾	Day-time L _{Req,d} ²⁾	Night-time L _{Req,n} ²⁾	Day-night L _{R,dn} ¹⁾	Day-time L _{Req,d} ²⁾	Night-time L _{Req,n} ²⁾
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts with one or more of the following: workshop; business premises; and main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

4.2 Dust-fall standard

This section of the EIA evaluates the likely air quality impacts associated with the operational phase of the Project. Prior to assessing the impact of the proposed activities on the atmospheric environment, reference needs to be made to environmental regulations and guidelines governing emissions and impacts of such operations. Air quality guidelines and standards are fundamental to effective air quality management, providing the link between the source of atmospheric emissions and the user of that air at the receptor site. The ambient air quality standards and guideline values indicate safe daily exposure levels for most of the population.

This section summarizes both national and international legislation pertaining to air pollution and criteria pollutants relevant to the study.

National Regulations

Namibia has an Atmospheric Pollution Prevention Ordinance (NAPPO) (No. 11 of 1976) which addresses the following:

- Part II – Control of noxious or offensive gases
- Part III – Atmospheric pollution by smoke

- Part IV – Dust control
- Part V – Air pollution by fumes emitted by vehicle

The Namibian Atmospheric Pollution Prevention Ordinance (No. 11 of 1976) does however not include any ambient air standards.

International Guidelines and Regulations for Criteria Pollutants

Local ambient air quality criteria are not available, or are in the process of being developed, the proposed project will reference to international criteria. This serves to provide an indication of the severity of the potential impacts from the proposed activities. The most widely referenced international air quality criteria are those published by the WHO and the South African (SA) National Ambient Air Quality Standards (NAAQS). The Standards South Africa has also published a set of dust fall standards (SANS 1929:2005). These standards have been used to evaluate the level of dust deposition and related hazards to human population. Tables 6 represents SANS 1929:2005 for dust deposition while Table 7 the South African NAAQS for criteria pollutants.

Table 5: Four-band scale evaluation criteria for dust deposition (SANS 1929:2005)

Band Number	Band Description	Dust rate (D) mg/m ² /day	Comment
1	Residential	D < 600	Permissible for residential and light commercial
2	Industrial	600 < D < 2400	Permissible for heavy commercial and industrial
3	Action	1200 < D < 2400	Requires investigation and remediation if two sequential months lie in this band, or more than three occur in a year
4	Alert	2400 < D	Immediate action and remediation required following the first incidence of dust fall rate being exceeded. Incident report to be submitted to relevant authority.

Table 6: Air Quality Guideline and Standards for Respirable particulate Pm₁₀ (US-EPA, 2000).

Averaging period (µg/m ³)	South African SANS 1929:2005 (µg/m ³)	WHO (µg/m ³)	US-EPA (µg/m ³)	European Union (µg/m ³)
Annual average	40	60-90	50	80
Max. 24 hours average	75	150-230	150	250

Table 7: South African NAAQS for criteria pollutants

Pollutant	Averaging Period	limit Value (µg/m ³)	Frequency of Exceedance
PM _{2.5}	24 hours	25	4
	1 Year	15	0
PM ₁₀	24 hours	75	4
	1 year	40	4

PM₁₀ describes all particulate matter in the atmosphere with a diameter equal to or less than 10 µm and are generally emitted from motor vehicles (diesel engines) and burning of wood. PM_{2.5} describes all particulate matter in the atmosphere with a diameter equal to or less than 2.5 µm and are mostly related to combustion.

5. STATUS AND EXPECTED LEVELS OF DUST AND NOISE EMISSIONS ESTIMATION AT THE PROPOSED MINING AREA

Activities around the exploration licence area mainly consist of tourism and small-scale livestock farming. Besides other exploration activities, there are no other industries or operating mines in the area. Probable sources of air pollution in the area are emissions and dust from vehicles travelling on gravel roads, dust generated by cattle grazing and wind erosion from the exposed areas.

Data from Meteogram reports shows that the air quality in the Opuwo area which is 40 km northeast mining license area have fine particle matter levels (PM_{2.5}) ranging from 13-34 µg/m³ and particle matter (PM₁₀) is about 9 µg/m³.

Table 8: Meteogram report for Opuwo Town, Kunene region

	3am-6am	6am-9am	9am-12pm	12pm-3Pm	3Pm-6Pm
Wind direction	SSW	SSE	E	NE	E
Wind speed (Km/h)	11-12	12-13	12-13	10-12	11-13
Temp °C	20°C	19°C	32°C	37°C	36°C
PM _{2.5} (µg/m ³)	13.35	14.5	22.5	31.3	34.8

Quantification of total suspended PM (TSP) and PM₁₀ emissions, i.e., dust emission factors for various activities of copper ore extraction and processing was not done, due to the fact that mining activities have not commerce. Therefore, literature review of similar activities was studied to provide a prospect of expected dust emissions. The quantification of TSP and PM₁₀ emissions results in Table 9 below was performed according to (Environmental Protection Agency) EPA recommendations (US EPA AP-42, Compilation of Air Pollutant Emission Factors) and Serbia Pollutant Inventory (Emission Estimation Technique Manual for Mining and Processing of Metallic Minerals, 2012). Dust emission factors by activity types and equipment, related to natural and technological conditions of copper mine, be given in Table 9 below.

Table 9: Dust Emission Factors for Various Operations at Mines

Operation/Activity	Units	Emission Factor	
		TSP	PM ₁₀
Drilling	kg/hole	0.59	0.31
Shovels	kg/t	0.025	0.012
Bulldozers 1	kg/h	17.0	4.1
Graders	kg/VKT	0.19	0.085

Wheel generated dust from unpaved roads	kg/VKT	4.23	1.25
Trucks dumping	kg/t	0.012	0.0043
Primary crushing	kg/t	0.01	0.004
Miscellaneous transfer points (conveying)	kg/t/trans point	0.00032	0.00015

Similarly, infield measurement for noise emission were not conducted. The main reason is mining activities have not commenced. Therefore, site-specific mining noise emissions are unavailable. Noise emission data for the actual plant and machines are primarily estimated from the data supplied by equipment manufacturers. This approach was followed during the process of noise mapping. Noise source data presented in Table 3 originate from manufacturers' documentation and catalogues.

Table 10. Noise levels of mining, auxiliary, and other equipment

Equipment	Noise Level (dB(A))
Trucks	114
Shovels	103
Bulldozers	116
Drilling rigs	95
Graders	106
Primary and secondary crushers (ore)	110
Crushers (overburden)	104
Belt conveyor for ore	65

6. ANTICIPATED IMPACTS AND MITIGATION MEASURES

6.1 Air Pollution Assessment and Mitigation Measures

As per the real time air quality index (AQI), Kunene region has a good air quality of $6 \mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$ and $10 \mu\text{g}/\text{m}^3$ PM_{10} . Whereas the Opuwo town has a moderate a quality with $13\text{-}34 \mu\text{g}/\text{m}^3$ $\text{PM}_{2.5}$. However, there

are no notable negative environmental impacts on the proposed mining site and its environs with respect to dust deposition.

Sources and levels of dust emission will be identified and established during development of a long-term plan for production of the copper ore mining. Analysis of dust emissions from production operations in open pits may include drilling, loading, and haulage, as well as facilities for primary and secondary crushing and floatation. Special attention will be given to dust emission sources on waste dumps and tailing ponds. Fugitive emission of dust during drilling and vehicular movements earthworks and are expected to be the main air pollutants during the pre-operational stage.

Without appropriate mitigations, drilling and pre-construction phase activities may generate significant localized total suspended particulate (TSP) levels, with worst case conditions occurring in clear weather without watering.

To reduce air quality impacts during the initial operation and operation phase, air quality management measure and mining good practice as set out in EHS Guidelines should be implemented.

Dust suppression by using techniques of ore/waste maceration and water spraying. These techniques will reduce emission of suspended particles into the atmosphere of the wider area of the open pit mine resulting in the improvement of air quality (see table 11 for specifics).

Table 11. Identifies some sources of dust and their potential mitigation measures

Sources of Dust	Mitigation Measures
Trucks and vehicles on the mine and community roads	Restricted speed limit
Dust road surfaces within the mine	Should be covered with dust binding chemical or sprayed with recycles water and compacted
Primary and Secondary crushing and floatation	sprayed with water
Stock piles	Should be covered with dust binding chemical or sprayed with recycles water

The mine will consider to create a buffer zone between the mine and the community, by purchasing additional land surrounding the mine to act as a buffer zone, which may help in reducing dust impact on the surrounding community by increasing the distance from the local communities.

Proper PPE will be provided to workers to meet the requirements in occupational exposure limits for hazardous agents in work place and EHS Guidelines.

6.2 Noise Impacts Assessment and Mitigation Measures

Noise management in general supports the standpoint that one should always be “one step ahead” of the potential problem, which might generate elevated noise emission both in the working and the living environment. During the pre-operational phase, it was observed that noise was generated on site by drilling machinery, power generation and vehicular movements. Noise model predicts that there would be a significant increase in localized noise which is expected during mining operation and construction of mining infrastructure, from drilling and milling activities, equipment unloads and installation and noise from goods and material transportation. Though noise levels may be high, the impacts will be temporary and localized, and can be further mitigated.

Noise management measures would be mainly related to the control and reduction of noise in the working environment. To ensure the mining processes meet noise standards and to protect workers and adjacent residents, the following mitigation measures and good practice as set out in EHS Guidelines should be implemented:

Table 12. Identifies some sources of noise and their potential mitigation measures

Sources of Noise	Mitigation Measures
Drilling and blasting activities	limited to reasonable hours during the day and early evening. Construction of mining infrastructures should be strictly prohibited during the night-time (22:00 h to 07:00 h).
Equipment and machinery	Equipped with mufflers and should be properly maintained to minimize noise.
Vehicles transporting	Slow down and not use their horn when passing through or nearby sensitive locations,

	Transportation routes and delivery schedules should be planned during detailed design to avoid sensitive areas to noise pollution and high traffic times.
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- Proper PPE will be provided to workers to meet the requirements in occupational exposure limits for hazardous agents in work place and EHS Guidelines.

7. QUALITATIVE IMPACT SIGNIFICANCE RATING

Table 13. Provides the impact rating for noise and air pollution

	IMPACT RATING FOR NOISE	IMPACT RATING FOR AIR POLLUTION
Nature of the impact	Negative direct impact on the environment around the mine.	Negative direct impact on the air quality in the surrounding environment.
Sensitivity/Vulnerability/Irreplaceability of Resource/Receptor	Low -The mining operation will increase the noise levels at areas in very close proximity to the plant and mining cast pit.	The mining operation is expected to reduce air quality in the mine and of the surrounding area, but not to the closest Opuwo town at the sensitive receptors is not at a close proximity to the proposed plant and mining activity. While movement of mine vehicle on the road outside the mine is expected to increase dust concentration in the surrounding areas.
Impact Magnitude	Small	Medium
Extent of impact	Localised	Localized
Duration of impact	Long term (the duration of the operation).	Long term (the duration of the operation).
Scale of the impact	No notable changes to the noise levels at receptors situated at a considerable distance from the mining activities. E.g. Opuwo town	No expected to cause notable changes to the air quality at sensitive receptors situated at a considerable distance from the mining activities, this is primarily based on the observed current low dust levels at receptors distant from mine, a situation likely to change when mining operation commences and significance difference in dust level is expected from increase vehicular activity through the community.
Frequency of impact	Periodic	Periodic
Degree of Confidence to minimum mitigation required	High	High

8. ENVIRONMENTAL MONITORING PLAN

Table 14: Summary of Environmental monitoring Plan during operation phases

Environmental Impact		Parameter/Methodology	Monitoring Location	Monitoring Frequency	Monitoring Implemented by	Supervised by
Air pollution control	Initial mining operation Phase	Ambient dust monitoring	Boundaries of the drilling location and road network And Mining site	Quarterly	Environmental Expert	Health and safety office
		Compliance inspection implementation of air pollution control measures		Daily		
	Operation Phase	Emission monitoring (PM, SO ₂ , other as applicable)	Exhaust stack And Nearest sensitive areas	Continuous yearly		
Noise pollution control	Initial mining operation Phase	Ambient noise monitoring	Boundaries of the drilling location and road network	Monthly during initial mining phase		
	Operation Phase	Noise monitoring	Nearest sensitive receptors	Semi-annually		

9. CONCLUSIONS

Environmental impacts of mining have been studied for many decades. Today it is well recognized that improper planning and negligence of regulations have resulted to appreciable damage, degradations and deterioration of the environment and ecological damage to water, air and soil. The degradation of various environmental factors to a large extent affects the health of mine worker, human and animal populations living in the vicinity of the mining area.

The potential negative impacts associated with the proposed mining project are expected to be low to medium in significance. Provided that the relevant mitigation measures are successfully implemented by the proponent, there are no environmental reasons why the proposed project should not be approved. The project will have significant positive economic impacts that would benefit the local, regional and national economy of Namibia.

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CONSENT

(Section 55(9) of the National Heritage Act, 2004 (Act No. 27 of 2004)) Consent is hereby given to:

05th October 2022

Consent Number No: 145/2022

Name of applicant: Shiloam Mining and Investment cc

(Title and full name of the applicant)

Address of applicant: PO Box 80081, Olympia

(Address of the applicant and of the applying institution (if applicable))

For: Mining License (ML) 249 for the mining activities of Base, Rare metals and precious metals.

(Type of Activity applied for)

Of: No heritage resources found within the mining license

(Description of Heritage Resources)

From: Located 40 Km northeast of Opuwo in the Kunene region.

(Description of the site, location as in the application)

[Handwritten signature]

In accordance with:

**ARCHAEOLOGICAL AND HERITAGE IMPACT ASSESMENT FOR PROPOSED
COPPER MINING ACTIVITIES ON MINING LINCENCE (ML249) LOCATED IN
OMBARUMBU AREA IN THE KUNENE REGION.**

(Specify relevant documentation and Permit application date)

The following conditions (imposed in terms of section 55(9) of the Act.) apply to this permit:

- a) That as per section 55 (9) (a) the activity authorised by this consent be supervised by a person with appropriate professional qualifications or experience in the identification and conservation of heritage.
- b) That any archaeological or palaeontological object or meteorite found in the course of the activity authorised by the consent must be recorded, conserved and dealt with as per the manual on Chance Find Procedures of heritage resources; and
- c) that Namibian citizens, especially members of the local community in and around the project area, be engaged in the activity authorised by the consent for the purpose of identification of heritage resources in the project area as well as of receiving professional training;
- d) That the consent holder reports back to the National Heritage Council every six (6) months on compliance with the conditions of this consent.
- e) This Consent does not exempt the holder from any conditions that may be imposed by owners, hosts or any other relevant authorities in consultation with NHC who have a stake in the project area.
- f) NHC shall not be liable for any losses, damages or injuries to persons or properties as a result of any activities related to this permit.

EWPN

- g) This Consent is subject to the provisions of the National Heritage Act (Act 27 of 2004). Should any of the conditions contained herein conflict with the Act; the provisions of the Act as per section 55 (10) shall prevail.
- h) Adopt the Chance Find Procedures.
- i) This consent is renewable, upon submission of an application at least two months before the current permit lapses

(List any conditions that the Council may see fit to impose in terms of section 55 (9) of the act.

This Consent will be valid from 05th October 2022 to 04th October 2023



Director: National Heritage Council of Namibia

