A SCOPING REPORT ON THE ENVIRONMENTAL IMPACT ASSESSMENT FOR MANGANESE MINING ON MINING LICENCE 241, OTJOZONDJUPA REGION

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Signature consultant: _____

Signature proponent: _____

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IMPALA ENVIRONMENTAL

ENVIRONMENTAL IMPACT ASSESSMENT FOR MANGANESE MINING ON MINING LICENCE 241, OTJOZONDJUPA REGION

EXECUTIVE SUMMARY

1. Introduction

1.1 Overview

The proponent, Wepex Mining Resources (Pty) Ltd, was granted the mining license 241 by the Ministry of Mines and Energy. The license holder intends to mine manganese on the mining license. The applicant intends to quarry manganese for both the local and international market.

1.2 Location

The mining license area is located about 140 km northeast of Okahandja, Otjozondjupa Region. The coordinates for the centre of the mining license are 18.042194 and -21.233471.

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 IMPACT ASSESSMENT FOR MANGANESE MINING ON MINING LICENCE 241, OTJOZONDJUPA REGION

FINAL SCOPING REPORT

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1. Introduction

1.1 Project Background

The proponent, Wepex Mining Resources (Pty) Ltd, was granted the mining license 241 by the Ministry of Mines and Energy. The license holder intends to mine manganese on the mining license. The applicant intends to quarry manganese for both local and international market. An outline of the area is shown in the image below.

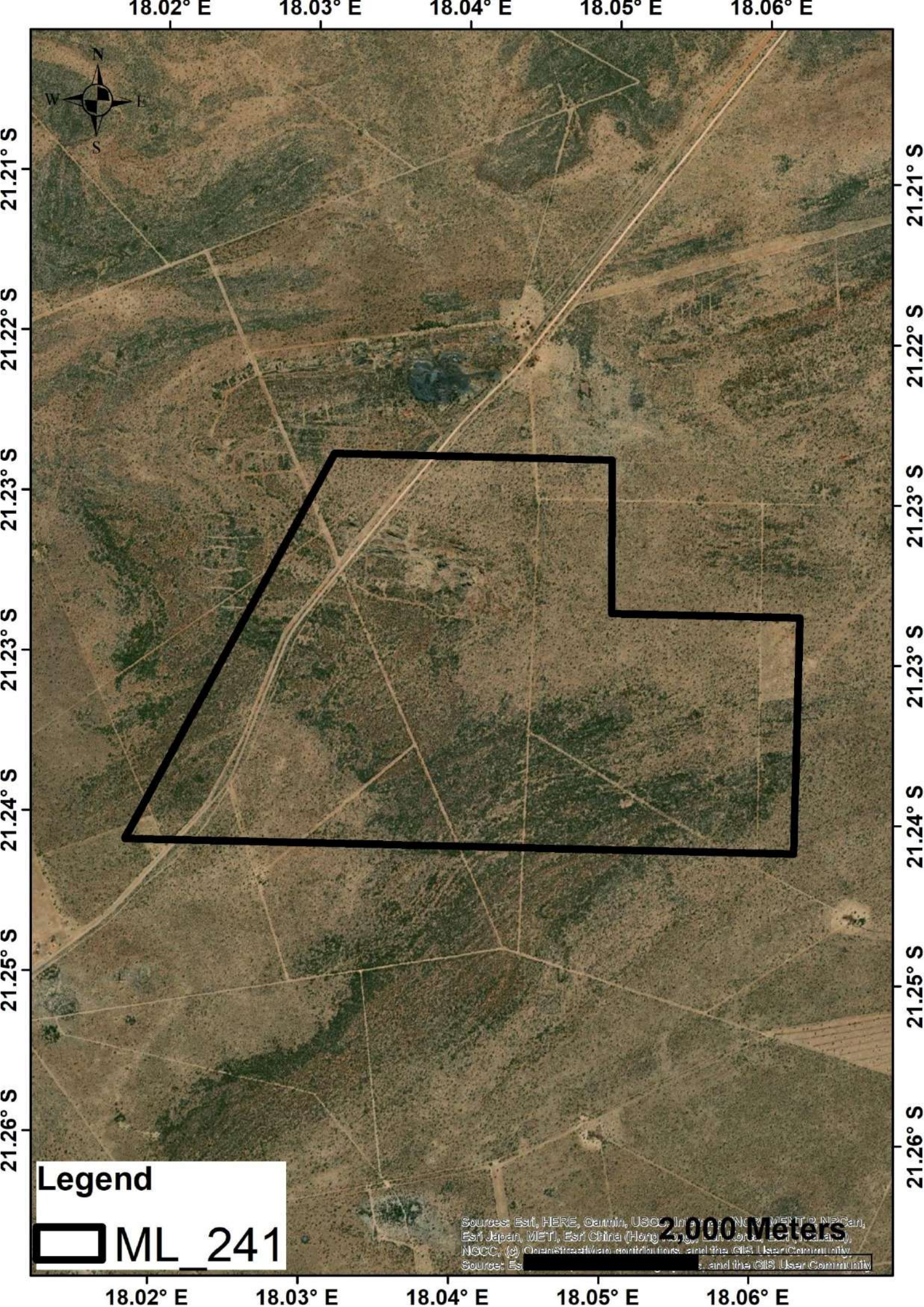
1.1.1 Mineral Licence Tenure

The mining licence number is **241**. The mining licence is issued to Wepex Mining Resources (Pty) Ltd.

The size of the mining licence is **638.20 hectares**. The mining licence applied for is only applicable to Base and Rare metals commodities.

The coordinates for the centre of the mining licence are:

Claim Number	Latitude	Longitude
241	-21.233471	18.042194


18.02° E
18.03° E
18.04° E
18.05° E
18.06° E
21.21° S
21.22° S
21.23° S
21.24° S
21.25° S
21.26° S
N
W
E
S
Legend
ML_241
2,000 Meters
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community
Source: Esri, and the GIS User Community

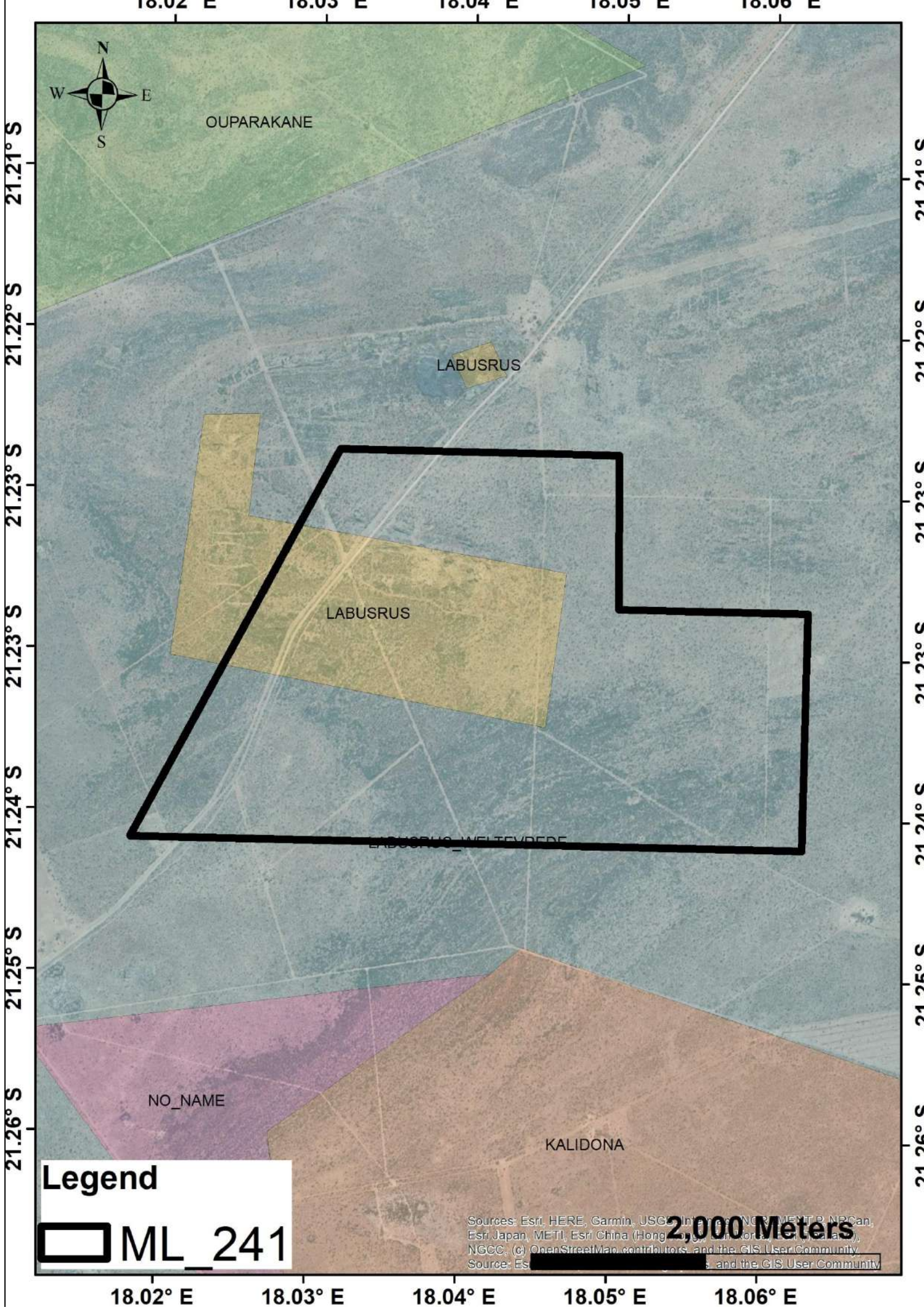
1.1.2 Proponent of the Proposed Project

The Mining licences belongs to Wepex Mining Resources (Pty) Ltd.

Licence Holder	Postal Address	Email Address	Contact
Wepex Mining Resources (Pty) Ltd	PO Box 9851, Eros, Windhoek, Khomas, 9000, Namibia		264813225073

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.


N
W
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S
OUPARAKANE
LABUSRUS
LABUSRUS
NO_NAME
KALIDONA
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2,000 Meters
18.02° E
18.03° E
18.04° E
18.05° E
18.06° E
21.21° S
21.22° S
21.23° S
21.24° S
21.25° S
21.26° S

1.2 Project Location

The mining license areas are located about 140 km northeast of Okahandja, Otjozondjupa Region.

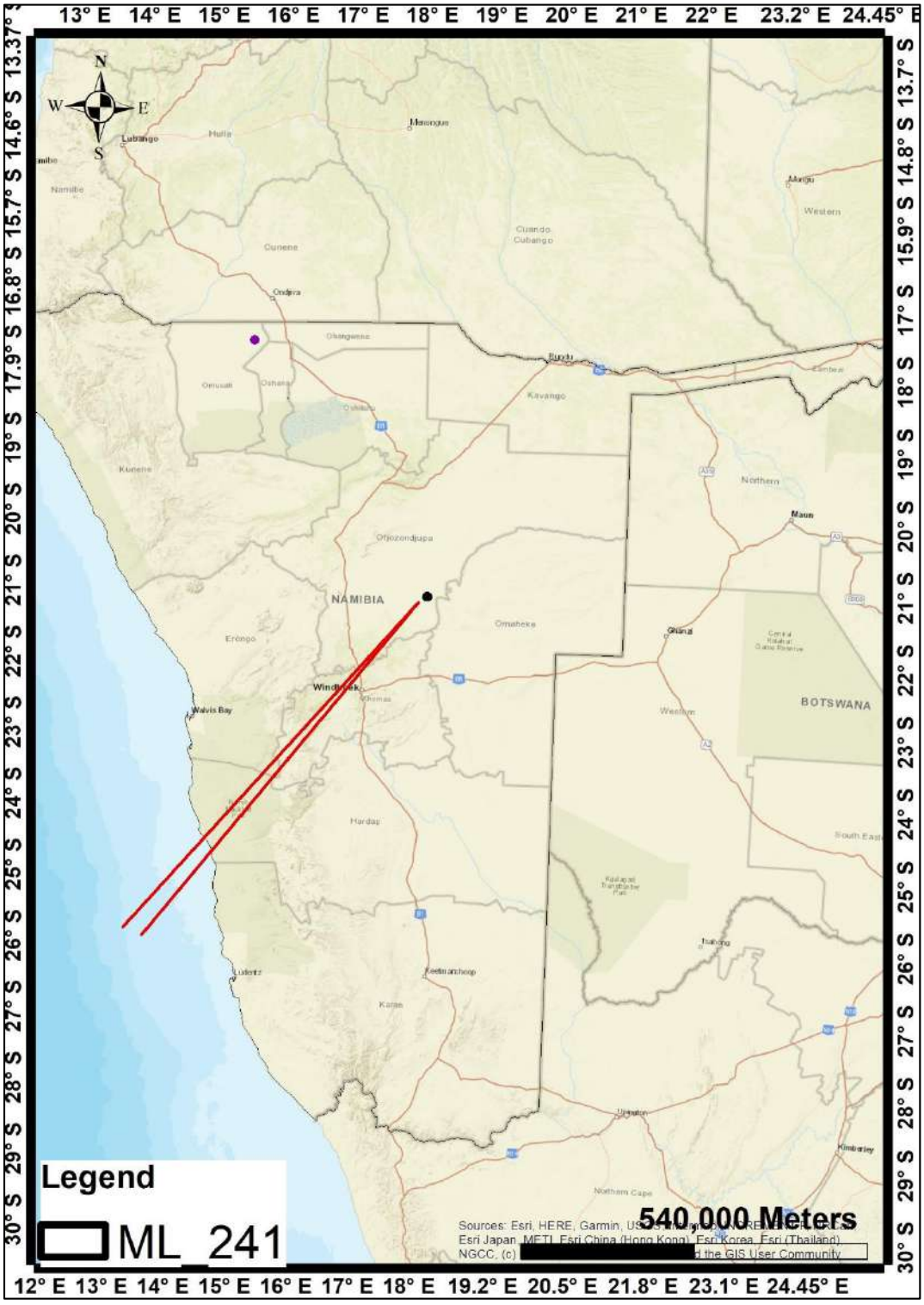

Figure 3 Locality map of the Mining licence area

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. The power requirements for the proposed project will be minimal as power will only be required for the following activities:

- Emergency lighting.
- Powering small 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 containers will be brought on site and utilised whenever necessary. The water will mostly be used for general consumption and cleaning. The water used for granite drilling or wire-saw cutting will be recycled.

1.3.3 Refuse and Waste Removal

The proponent will negotiate directly will 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 Okahandja. The Miner will undertake environmental rehabilitation, both during and at the conclusion of the quarrying 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 quarrying site are quite good. From Okahandja, the quarrying site will be accessed via the B1 and then the C31 road. The site is located 17 kilometres from the C31 road.

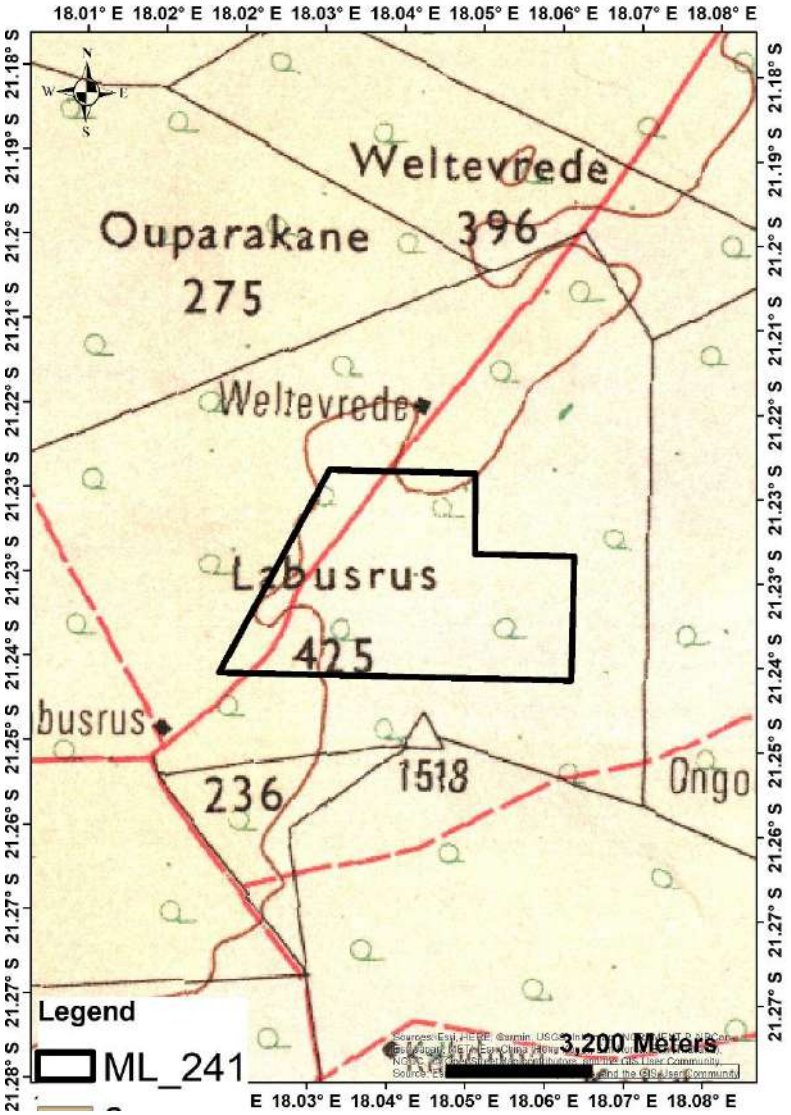

Figure 4 Topographic map showing the existing road network within the licence area.

1.3.8 Mobile Equipment

The proponent's vehicle fleet will be optimised during the next project phase. Provision will be made for 2 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 manganese mining on an area which is located about 140 km northeast of Okahandja, Otjozondjupa Region. 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.

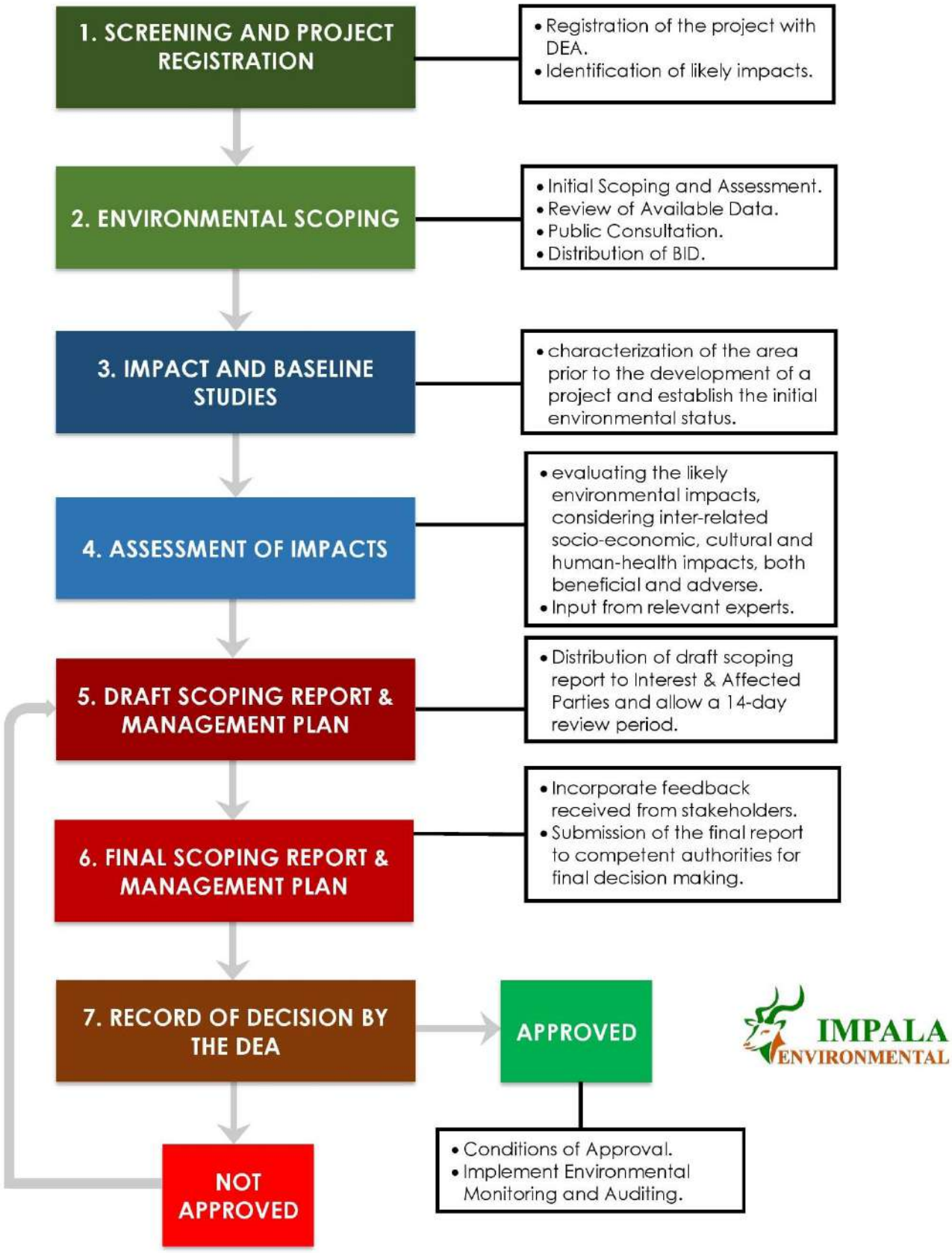

Figure 5 Flowchart of the Environmental Impact Assessment process followed in Namibia.

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.

A specialist study on archaeology was undertaken by Dr. Haitengi, a qualified archaeologist. As part of the study, a foot survey was undertaken to identify any potential artefacts or human remains which may occur in the area. The archaeological specialist study, together with the consent letter from the Heritage Council of Namibia, is annexed to this report.

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 white marble.

1.7.2.1 Mining Method Alternatives

Basically, marble quarrying involves cutting channels on all sides of large, rectangular sections of marble called quarry blocks. These blocks usually have an open face, and once the ends and backs of the doorstep-like ledges are channelled loose, horizontal lift holes are drilled along the bottom of the open face. These long quarry blocks are being freed from the surrounding mass, with diamond wire sawing. If more modern, effective and environmentally friendly mining methods than the preferred ones are developed, such methods will be assessed and or considered.

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 beneficiations 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 Mining Project

3.1 Introduction

Manganese is a chemical element with the symbol Mn and atomic number 25. It is a hard, brittle, silvery-gray metal that is commonly found in the Earth's crust. Manganese is an essential trace element that plays a crucial role in many biological processes, including metabolism, bone formation, and antioxidant function. It is also used in various industrial applications, such as the production of steel, batteries, and fertilizers.

Manganese was first isolated as a distinct element in 1774 by Swedish chemist Johan Gottlieb Gahn, although its presence in ores and minerals had been known for centuries. The name "manganese" is derived from the Latin word "magnes," which means magnet, as some manganese compounds exhibit magnetic properties.

In nature, manganese is typically found in the form of manganese oxides, which are abundant in soil, rocks, and minerals. It is also present in trace amounts in plants, animals, and human tissues. Manganese has several different oxidation states, with the most common ones being +2, +3, +4, +6, and +7. These oxidation states give manganese its versatile chemical properties, making it useful in various industrial processes.

Manganese has many important applications in modern society. One of its primary uses is in the production of steel, where it acts as a deoxidizer and desulfurizer, improving the strength and toughness of the steel. Manganese is also used in the production of batteries, such as alkaline and rechargeable batteries, due to its high electrochemical activity. Additionally, manganese is used as a pigment in paints, as a component in fertilizers to improve plant growth, and as a nutritional supplement in animal feed and human diets.

3.2 Manganese Quarrying Method

There are various options for mining out a Manganese. In choosing a method, important considerations are the kind of material, the shape and size of the geologic formation, the thickness of the overburden, the topography, the production level, the locality of the quarry and imposed restrictions by the government. The main methods used for manganese extraction are:

Open-pit mining: In this method, manganese ores near the surface are extracted by removing overlying materials and extracting the manganese ore using heavy machinery, such as bulldozers, excavators, and trucks.

Underground mining: When manganese ores are buried deep below the surface, underground mining methods may be used. This involves drilling shafts and tunnels into the ore deposit and extracting the ore using underground mining equipment.

Beneficiation: Manganese ores are often associated with other minerals, and beneficiation is the process of separating manganese ore from the gangue (unwanted minerals). Common beneficiation techniques include gravity separation, magnetic separation, and froth flotation.

Smelting: After beneficiation, the manganese ore is often smelted to produce ferromanganese or silicomanganese, which are used in the production of steel and other manganese-containing alloys. Smelting involves heating the ore with a reducing agent, such as coke or carbon, in a furnace to remove the oxygen and reduce the manganese to its metallic form.

Electrolytic process: Another method of manganese extraction is through electrolysis, where manganese dioxide is dissolved in sulfuric acid to produce manganese sulfate, which is then electrolyzed to obtain manganese metal.

Overall, the extraction of manganese from its ores requires a combination of mining, beneficiation, and metallurgical processes, depending on the type of deposit and the quality of the ore.

3.2.1 Mineral Processing

After mining, ore is crushed and screened, and split into various particle size fractions ranging from fines (under 6mm) to lump ore and concentrates (between 6mm and 75mm). Crushed and screened ore may be concentrated by washing, sink-float, jigging, tabling, flotation, dense media separation and high intensity magnetic separation to produce a saleable concentrate.

Carbonate manganese ores may be calcined. Higher-quality fines may be agglomerated, nodulised, sintered or pelletised. Lower-quality ores, fines and complex fine-grained ores may be flotated. In cases where manganese is associated with other metals, hydrometallurgical processes such as solvent extraction are used, sometimes after roasting or sintering to improve solubility, according to Roskill. The specifications of the resulting concentrates vary depending on the nature of the ore and the target market. Typically, different grades of ore are blended according to required specifications and then crushed, followed by screening into fines and lump ore.

The ore may then undergo dense media separation after which, silicon waste is removed typically through flotation separation, and clays and other contaminants are washed out. The ore may then be further blended to meet customer specifications.

3.2.2 Quarry Residue and rehabilitation

The only noticeable mine residue will be the “waste” mining material not usable. This material can be used for rehabilitation purposes during decommissioning. The overburden removed during the opencast operation will be used to fill the excavations during rehabilitation with the result that on completion of mining no waste dumps will remain.

3.3 Labour Requirements

The proponent intends to employ more than 26 personnel, including 4 management staff for the first phase of the project. The employees will be sourced from the local community including people from Okahandja. All employees will undergo a safety induction, first aid training course and wildlife awareness program. The Labour Act of 2007 will always be adhered to.

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

Since the area is located on privately-owned farm, 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 Hardap in the south (Mendelsohn, et al., 2002). Otjozondjupa Region is another lager Region in Namibia occupying the central of Namibia with a land surface area of 105,185 km and represents 12.8% of the total land surface area of Namibia. The Otjozondjupa Region has a variety of attractive tourist attractions. The Waterberg Plateau is a particularly prominent feature, elevated high above the plains of the Kalahari of Eastern Namibia.

The farming activities of Okahandja and Otjiwarongo are homogenous as these parts are well known for cattle farming. The Otavi and Grootfontein districts, and to a lesser extent Otjiwarongo, are the granary of Namibia. The Otjozondjupa Region has a great potential to capitalize on and establish industries associated with such farming activities and by-products of it. It further has the advantage of combining communal and commercial farming in the same region.

4.2 Climatic Conditions

4.2.1 Temperature

In the mining area, the average annual temperatures lie between 15-25°C. September to January are the warmest months with an average summer temperature of about 25°C, while June and July are the coldest months, with mild average winter temperatures of about 15°C.

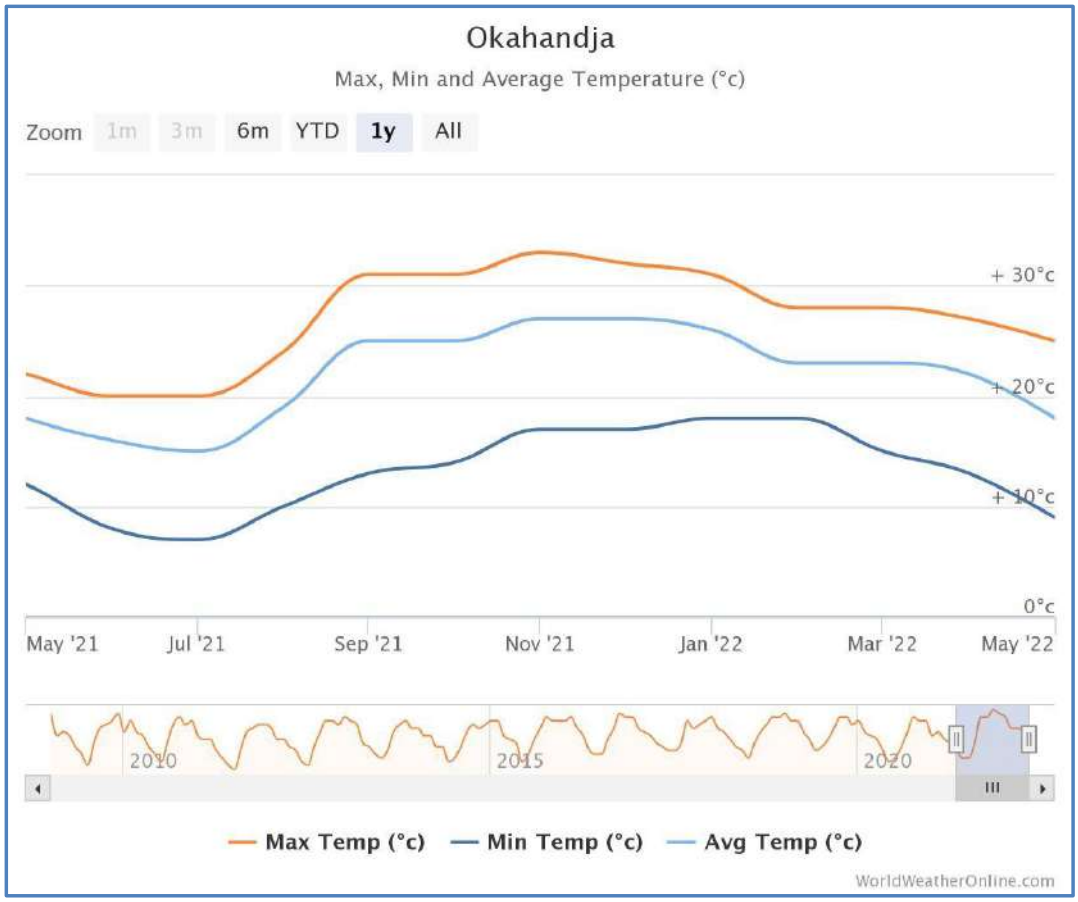

Figure 6 A graph showing the temperature patterns in Okahandja, from www.worldweatheronline.com

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

4.2.2 Precipitation

In the mining area, the highest rainfall is usually experienced in January which may reach 69 mm with average rainfall days of 2. Little to no rainfall periods are experienced from May to September with an average rainfall record of 0-3mm. The graph below shows the rainfall patterns in the area.

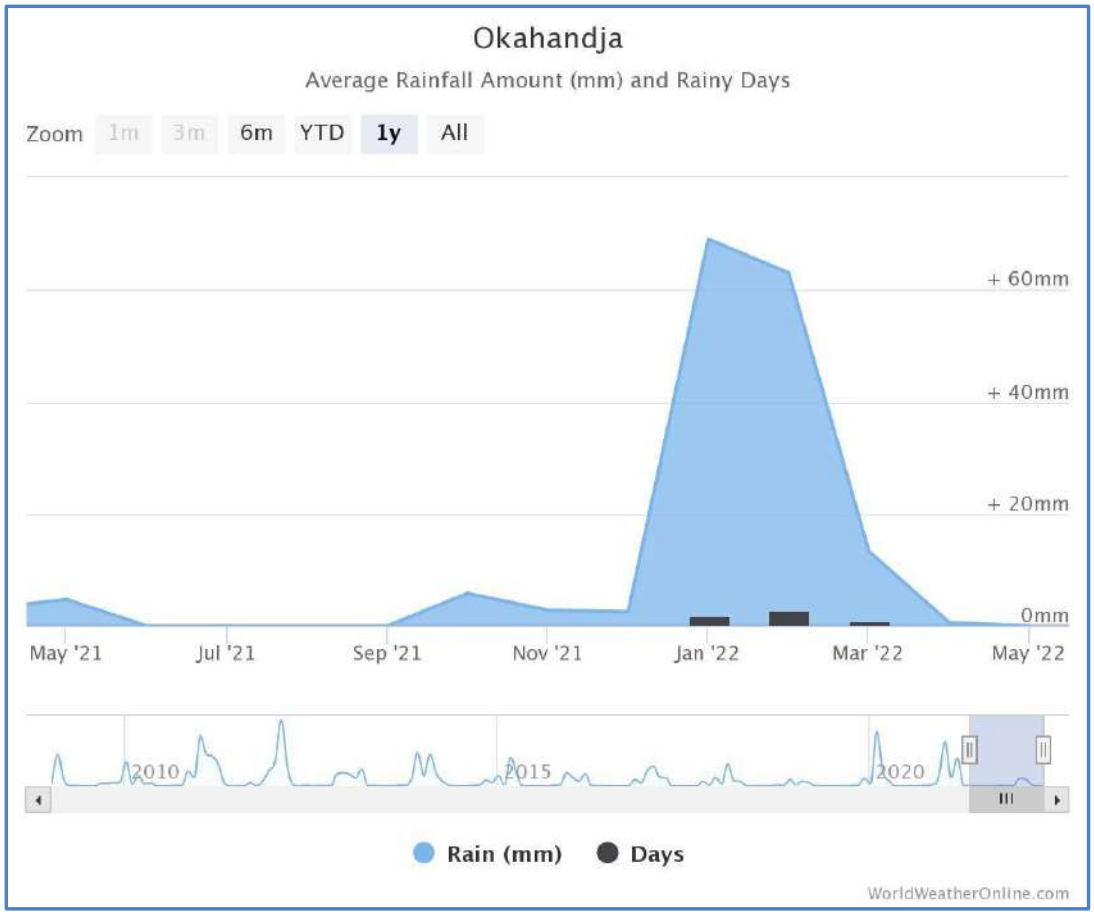

Figure 7 A graph showing the rainfall patterns in Okahandja, from www.worldweatheronline.com

4.2.3 Wind

Predominantly south easterly. Southerly, easterly and northerly airflow is common. The strongest winds in Okahandja are experienced from October to December with a wind speed of 29.6 – 31.9 kmph. The graph below depicts the wind patterns in the area.

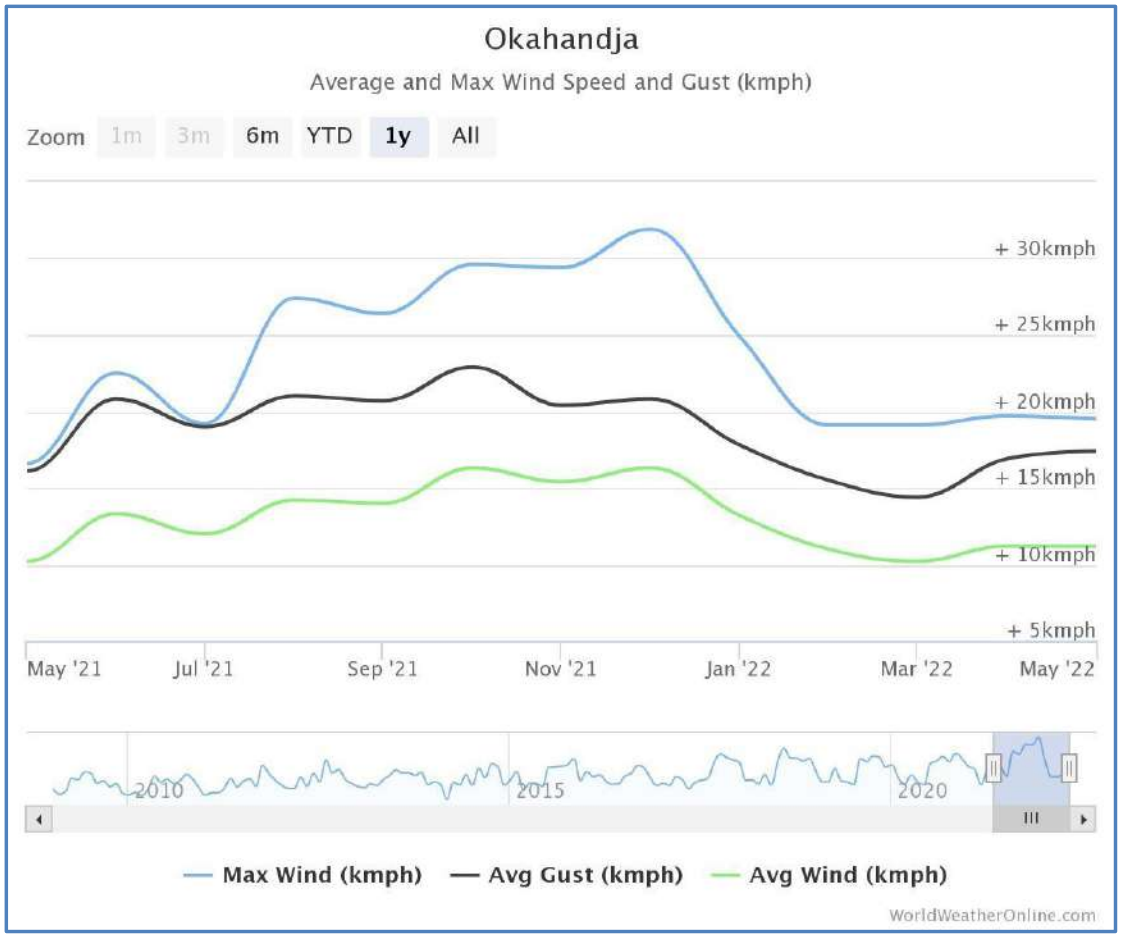

Figure 8 A graph showing the wind speed patterns in Okahandja, from www.worldweatheronline.com

4.2.4 Humidity

The relative humidity during the least humid month of the year, i.e. September is 16%. September to November are usually the least humid months due to high temperatures, high levels of radiation and dry soils after the dry winter season. The most humid months are February to April, with about 40-60% relative humidity. Namibia has low humidity levels in general, and the lack of moisture in the air has a major impact on its climate by reducing cloud cover and rainfall, an in turn increasing the rate of evaporation.

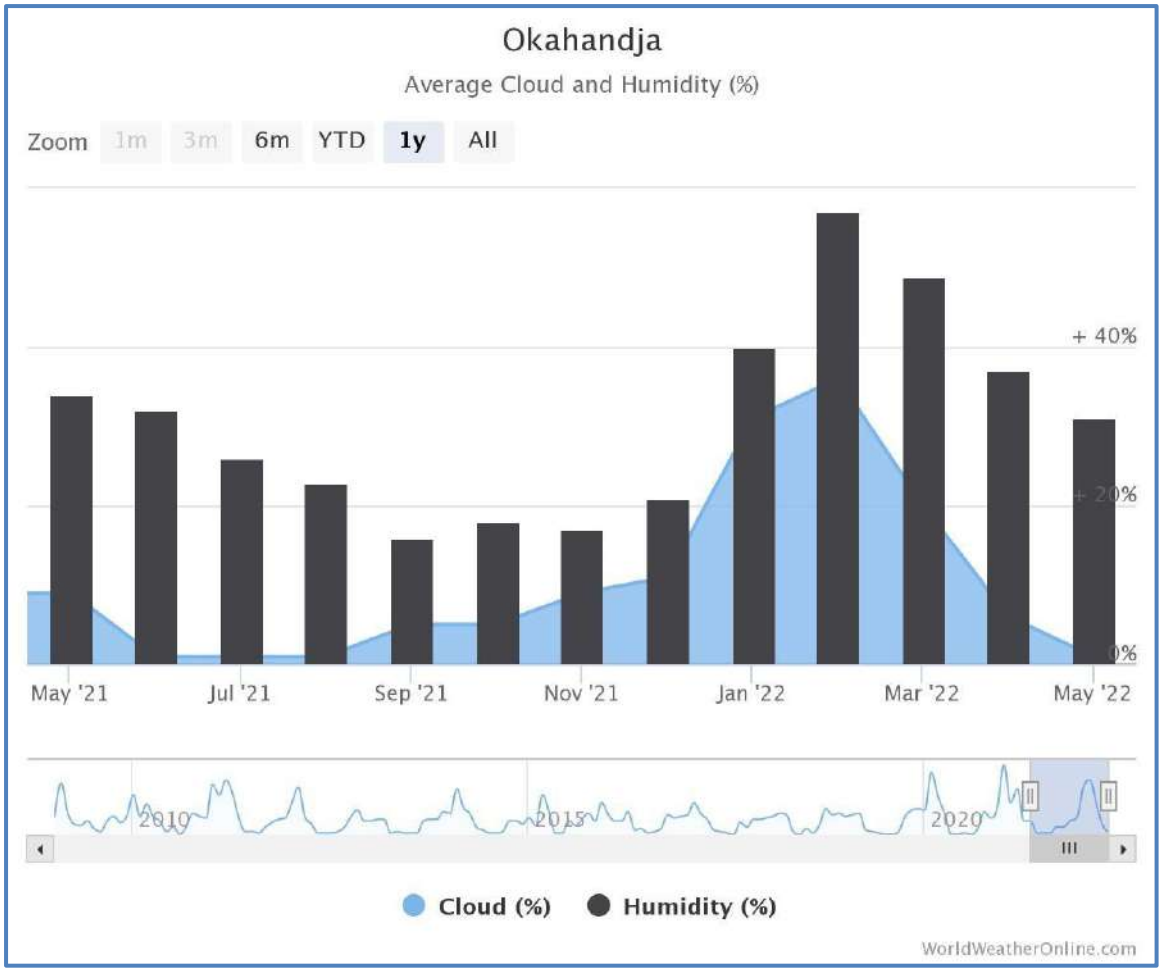

Figure 9 A graph showing the humidity patterns in Okahandja, from www.worldweatheronline.com

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.

PM_{10} 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. NO_2 and nitric oxide (NO) are formed simultaneously in combustion processes and other high temperature operations such as blast furnaces. Sources of SO_2 include fossil fuel combustion from industry and power plants. SO_2 is emitted when coal or other biomass fuels are burnt for energy.

Data from accuweather.com shows that the air quality in the area is generally excellent with an air quality index of 19 AQI. The ground-level ozone (O_3) is about 19 µg/m³ which is excellent. The fine particle matter levels ($PM_{2.5}$) are about 7 µg/m³. The particle matter (PM_{10}) is about 6 µg/m³. The nitrogen dioxide (NO_2), carbon monoxide (CO), and sulphur dioxide (SO_2) levels in the area are recorded to be 0 µg/m³.

4.4 Geology

4.4.1 Geological setting

The Project is located within part of the Southern Central Zone of the Damara Orogen. This terrane comprises mid Proterozoic granitic basement inliers, overlain by metamorphosed late Proterozoic arkoses, shelf carbonates, turbidites and minor volcanic rocks that have been intruded by numerous granites and pegmatites.

Most of the project area is underlain by meta-sedimentary rocks of the Nosib Group meta-arkoses (Etusis Formation) or the stratigraphically younger Swakop Group marine carbonates and meta-turbidites comprising the Arandis Formation (biotite schist, minor quartz schist calc-silicate rock and amphibolite), the Uis Formation (dominantly dolomitic and calcitic marbles with minor calc-silicate) and the overlying Kuiseb Formation (schistose quartz feldspar mica meta-greywacke and meta-pelite). Glaciogenic mixtites of the Chuos and Ghaub Formations have limited exposure in the project area. The Swakop Group sediments have been intruded by a series of syn-, late-syn- and post-tectonic granite and pegmatite bodies.

The project is straddled by the magnetically defined regional scale Abbabis Lineaments. These lineaments are interpreted to be important tectono-stratigraphic boundaries associated with changes in sedimentology, structure and type of granitic intrusion observed in the Damara Orogen and have known association and control with uranium and other forms of mineralization. The structural setting of the Project area is complex with sediments deformed during poly-phase deformation and metamorphosed to upper greenschist-amphibolite facies.
(Miller, 2008)

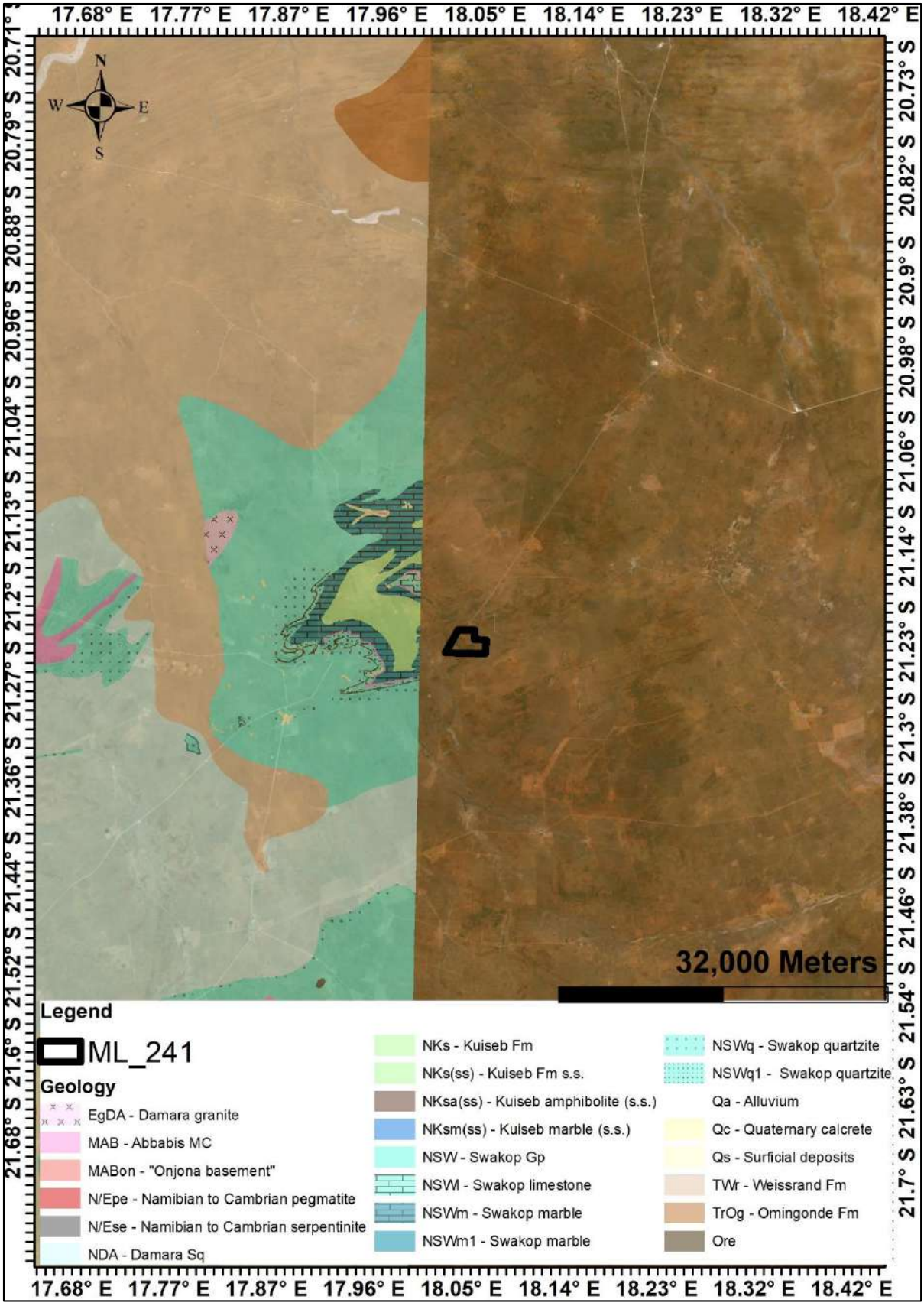

Figure 10 A geological map of the area

4.5 Hydrogeology and Water Resources

The area is underlain by rocks with little groundwater potential.

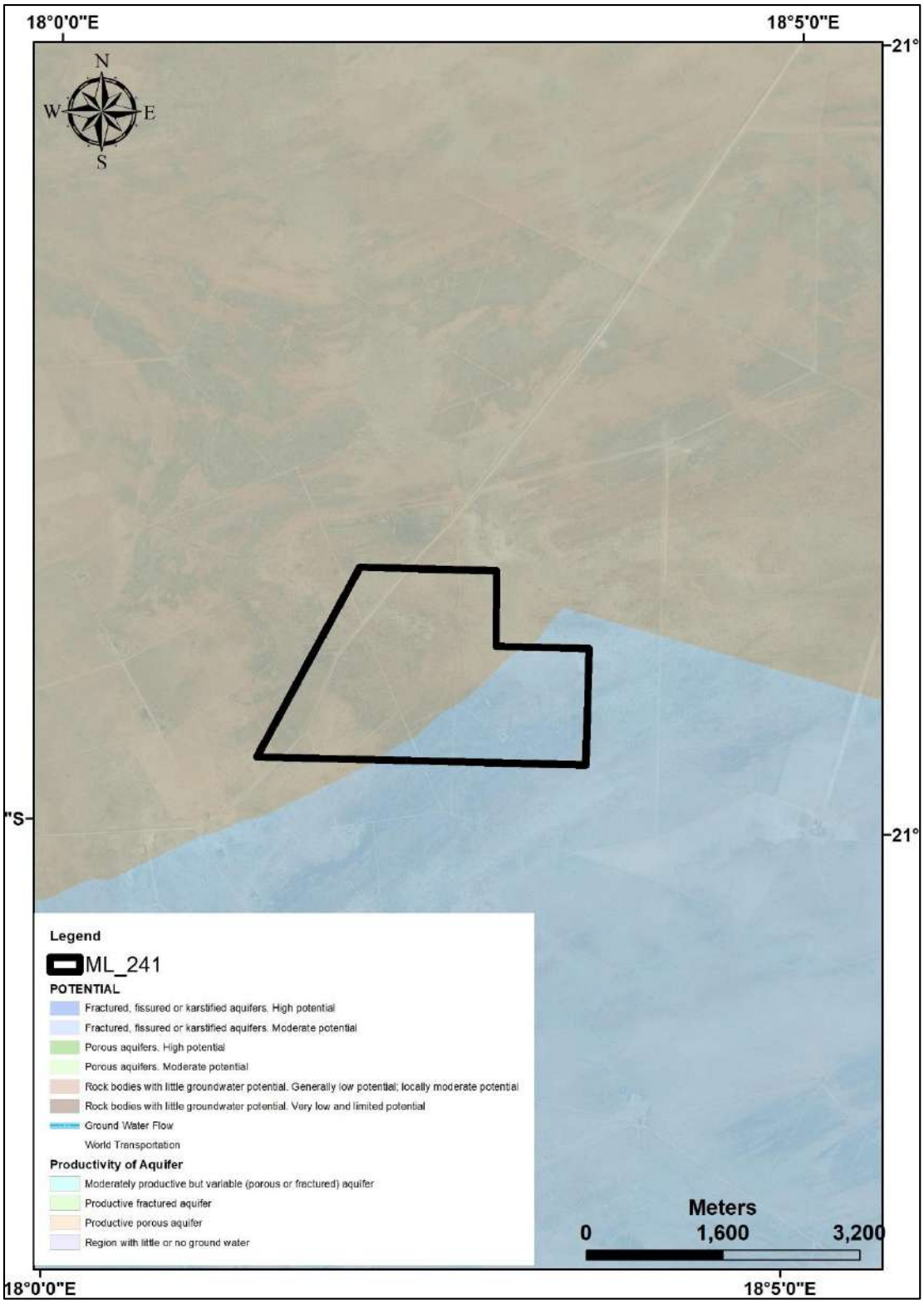

Figure 11 Hydrogeological Map of the Area

4.6 Flora

The study area is characterised by low-medium botanical diversity. Based on site visits and the literature review, all the vegetation that are found within the vicinity of the area are of “medium” to “high” sensitivity against external conditions.

There are several tree species that occur in the area. These species include Camel Thorn, Shepard’s Tree, Grey Camel Thorn, and the Ebony Tree. Camel Thorn occurs in dry woodland along watercourses in arid areas where underground water is present as well as on deep Kalahari sands and is therefore relatively common in the study area. Grey Camel Thorn occurs on deep Kalahari sand between dunes or along dry watercourses and occurs sparsely within the study area. Shepard’s Tree occurs in semi-desert areas and bushveld but is common on sandy to loamy soils and calcrete soils and is relatively common within the study area, primarily along secondary watercourses and areas adjacent to the primary watercourses. Ebony Tree occurs in semi-desert and desert areas, usually along watercourses and in depressions and could occur in the hills or on the flats within the study area.

The most important plant species found in the study area are the quiver trees (Aloe dichotoma). As succulents, they can store water quickly in their leaves and trunks, and thus often grow in arid areas where few other trees survive.

Grass is dependable on rainfall, which in-turn causes livestock and other animals to suffer during periods of minimal rainfall (Burke, 2003). The mining area, which is semi-arid, contains a few 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
Acacia erioloba	Camel thorn	Protected
Acacia mellifera	Black thorn	Secure
Acacia reficiens	False umbrella thorn	Secure
Acacia haematoxylon	Grey camel thorn	Protected
Acacia erubescens	Blue thorn	Secure
Acacia karroo	Sweet thorn	Secure
Acacia tortolis	Umbrella thorn	Secure
Acacia hereroensis	False hook-thorn	Secure
Commiphora tenuipetiolata	White-stem corkwood	Secure

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

Searsia (Rhus) lancea	Karree	Protected
Searsia (Rhus) marlothii		Secure

The density of vegetation in the vicinity of the mining site is sparse. Every effort will be made to protect the existing trees and schrubs, as these are very important to the ambience and visual appeal of the mining site. A vegetation expert will be consulted throughout the lifecycle of the mining 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
Acacia erioloba	Camel thorn
Acacia haematoxylon	Grey camel thorn
Albizia anthelmintica	Worm-bark false-thorn
Boscia albitrunca	Shepherd's tree
Euclea pseudebenus	Ebony tree
Ficus cordata	Namaqua fig
Ficus sycomorus	Common cluster fig
Maerua schinzii	Ringwood tree
Ozoroa crassinervia	Namibian resin tree
Searsia (Rhus lancea)	Karree
Sterculia Africana	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 mining area. The proposed mining 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, lions and elephants are rare in this area. There are no species which are exclusively endemic to the exploration area.

Based on literature review, development of a mining 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				
Xenopus laevis	COMMON PLATANNA	**SECURE**	ABUNDANTLY	(Daudin, 1802)
TOADS				
Breviceps adspersus	BUSHVELD RAIN FROG	**SECURE**	ABUNDANTLY	Peters, 1882
Bufo dombensis	DOMBE DWARF TOAD	**ENDEMIC & INADEQUETLY KNOWN**	ABUNDANTLY	Bocage, 1895
Bufo poweri	MOTTLED TOAD	**SECURE**	ABUNDANTLY	Hewitt, 1935
FOSSORIAL FROGS				
Phrynomantis affinis	SPOTTED RUBBER FROG	**AMBIGUOUS (RARE?)**	RARELY	(Boulenger, 1901)
Phrynomantis bifasciatus	BANDED RUBBER FROG	**SECURE**	ABUNDANTLY	(Smith, 1848)
SAND FROGS, BULLFROGS, RIDGED FROGS, CACOS, PUDDLE FROGS etc.				
Cacosternum boettgeri	COMMON CACO	**SECURE**	ABUNDANTLY	(Boulenger, 1882)

Hildebrandtia ornata	ORNATE FROG	**SECURE**	UNCOMMONLY	(Peters, 1878)
Phrynobatrachus mababiensis	MABABE PUDDLE FROG	**SECURE**	UNCOMMONLY	FitzSimons, 1932
Phrynobatrachus natalensis	SNORING PUDDLE FROG	**SECURE**	UNCOMMONLY	(A. Smith, 1849)
Pyxicephalus adspersus	GIANT BULLFROG	**SECURE**	ABUNDANTLY	Tschudi, 1838
Tomopterna krugerensis	KNOCKING SAND FROG	**SECURE**	RARELY	Passmore et al, 1975
Tomopterna tandyi	TANDY'S SAND FROG-	**SECURE**	ABUNDANTLY	Channing et al, 1996
TREE FROGS, REED FROGS & KASSINAS				
Kassina senegalensis	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 mining area, the mammal fauna will not be affected by the mining activities of the proponent. Namibia is seemingly well endowed with mammal diversity with around 250 species know 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
Acinonyx jubatus	Cheetah
Antidorcas marsupialis	Springbok
Atelerix frontalis angolae	Southern African Hedgehog
Canis mesomelas	Black-backed Jackal

Caracal caracal	Caracal
Crocuta crocuta	Spotted Hyena
Cynictis penicillata	Yellow Mongoose
Equus zebra hartmannae	Hartmann's Mountain Zebra
Felis nigripes	Black-footed Cat
Felis silvestris/lybica	African Wild Cat
Galerella sanguinea	Slender Mongoose
Genetta genetta	Small Spotted Genet
Ictonyx striatus	Striped Polecat
Lepus capensis	Cape Hare Secure
Lepus saxatilis	Scrub Hare
Manis temminckii	Ground Pangolin
Mellivora capensis	Honey Badger/Ratel
Oreotragus oreotragus	Klipspringer
Oryx gazella	Gemsbok
Otocyon megalotis	Bat-eared Fox
Panthera pardus	Leopard
Parahyaena (Hyaena) brunnea	Brown Hyena
Phacochoerus africanus	Common Warthog
Proteles cristatus	Aardwolf
Raphicerus campestris	Steenbok
Suricata suricatta marjoriae	Suricate
Sylvicapra grimmia	Common Duiker
Tragelaphus strepsiceros	Greater Kudu
Vulpes chama	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
Psammobates Oculiferus	Kalahari Tent Tortoise	Protected
Python Natalis	Southern African Python	Protected
Geochelone Pardalis	Leopard Tortoise	Protected
Varanus Albigularis	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 mining activities do affect reptile habitat, the project will not have any significant impact on the reptile species within the proposed mining 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 mining area.

4.8 Avifauna (Birds)

Simmons et al (2003) points that although Namibia's Avifauna is comperatively 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 scpecies 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 Socio-Economic Environment

4.9.1 Demographics of Okahandja

Okahandja is a city of 24,100 inhabitants in Otjozondjupa Region, central Namibia, and the district capital of the Okahandja electoral constituency. It is known as the Garden Town of Namibia. It is located 70 km north of Windhoek on the B1 road. It was founded around 1800, by two local groups, the Herero and the Nama.

Okahandja means the place where two rivers (Okakango and Okamita) flow into each other to form one wide one in Otjiherero. A German pastor, Heinrich Schmelen, became the first European to visit the town in 1827. In 1844, two missionaries were permanently assigned to the town, Heinrich Kleinschmidt and Hugo Hahn. A church dates from this period. A military post was established at the initiative of Theodor Leutwein in 1894, and it is this date that is officially recognized as the town's founding. A number of important historic Namibian people are buried in Okahandja, among them Maharero, Jan Jonker Afrikaner, Hosea Kutako and Clemens Kapuuo.

The population of Okahandja is growing rapidly. It stood at just over 14,000 as measured by the 2001 Population and Housing Census, and is estimated to have surpassed 24,000 in 2012. Von Bach Dam is situated outside of Okahandja. It provides the majority of Windhoek's water. An open-air curio market attracts tourists, and the town serves as the administrative centre for the Herero people.

4.9.2 Social Economic Impact

Although a few people (including 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 15 people, this means that 15 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 quarrying activities on the proposed mining site. 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 quarrying 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** (Quarrying Area)
	R	**Regional** (Otjozondjupa 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 27 people, this means that 27 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 quarrying project will require a significant capital investment of at least N$ 37 million. This will be used for purchasing plant and machinery required for the project.

Stimulation of skills transfer: Due to the nature of quarrying 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 27 people, this means that 27 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 quarrying 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 quarrying project; and
- Increased informal settlement and associated problems.

Table 8 Impact evaluation for socio-economy

Identified	Significance		Duration	Extent	Intensity	Probability
Impact	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. Quarrying 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 quarrying 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 quarrying 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 quarrying 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 quarrying 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 Okahandja 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

Quarrying 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 quarrying 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	Significance		Duration	Extent	Intensity	Probability
Impact	**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.

ENVIRONMENTAL MANAGEMENT PLAN FOR MANGANESE MINING ON MINING LICENCE 241, OTJOZONDJUPA REGION

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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 quarrying are fully aware of the environmental issues and the means to avoid or minimize the potential impacts of activities on site. The proposed quarrying 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 quarrying areas in connection with the quarrying project.

2. Health, Safety and Social Well Being

- Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against natural dangers on site, and radiation hazards; and,

- Promote good relationships with the local authorities and their staff.

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 quarrying activities or by personnel engaged in the quarrying 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 quarrying project.

G. Financial Provisions for Quarrying

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 quarrying 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 quarrying activities.

- 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 quarrying 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 quarrying 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 quarrying.

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 quarrying 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 quarrying, best international practices will be considered as a minimum standard for operation. The bulk of the power supply to the quarrying 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	• Control speed and operation of construction vehicles. • Prohibit idling of vehicles. • Maintenance of vehicles and equipment. • Sensitize field quarrying workers and contractors. • Workers should be provided with dust masks if working in sensitive areas.	• Contractor • Site Manager	• Amount of dust produced. • Level of Landscaping carried out.
Noise pollution	• 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.	• Contractor • Management	Amount of noise
Solid waste	• 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 quarrying.	• Management	Presence of well-Maintained receptacles and central collection point.

Oil leaks and spills	• 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.	• Contractor	No oil spills and leaks on the site
First aid	• A well-stocked first aid kit shall be maintained by qualified personnel	• Management	Contents of the first aid kit.
Visual	• Environmental considerations will always be adhered to before clearing roads, trenching and excavating.	• Management	• Employees will be trained on the importance of minimising visual impacts.
Archaeological Sites	• Buffer zones will be created around the sites. • Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of quarrying activities. • All archaeological sites to be identified and protected before further quarrying commences.	• Management	• Register of all archaeological sites identified.
Occupational Health and Safety	• 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.	• Contractor • Management	• Workers using Protective Equipment. • Presence of Well stocked First Aid Box. • Clean sanitary facilities.
Fauna	• 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.	• Management	• Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	• 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	• Management • Contractor	• Regular monitoring of any unusual signs of alien species.
Loss of vegetation	• 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.	• Contractor • Management	• Warning signs on site • restored vegetation
Operational Phase			

Environmental/ Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Noise pollution	• Maintain vehicles and drilling equipment. • Quarrying should be carried out only during daytime. • Workers to wear earmuffs if working in noisy section • Management to ensure that noise is kept within reasonable levels.	• Contractor • Management	• Amount of noise
Visual	• Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.	• Management	• Employees will be trained on the importance of minimising visual impacts.
Fauna	• 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.	• Management	• Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	• 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	• Management • Contractor	• Regular monitoring of any unusual signs of alien species.
Loss of vegetation	• 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.	• Contractor • Management	• Warning signs on site • restored vegetation
Solid waste	• 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.	• Contractor • Management	• Amount of waste on Site • Presence of well-Maintained receptacles and central collection point.
Oil leaks and spills	• 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.	• Contractor	• No oil spills and leaks on the site.

Archaeological Sites	• Buffer zones will be created around the sites. • Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of quarrying activities. • All archaeological sites to be identified and protected before further quarrying commences.	• Management	• Update Register of all archaeological sites identified.
First aid	• A well-stocked first aid kit shall be maintained by qualified personnel	• Management	• Contents of the first aid kit.
Fire preparedness	• 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.	• Management	• 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	• 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.	• Management	• Provide sanitary facilities. • Copies of Annual Audit
	Decommissioning Phase		
Environmental/ Social Impact	**Proposed mitigation measures**	**Responsibility**	**Monitoring plan/indicator**
Noise & Air pollution	• 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.	• Contractor • Management	• Amount of noise
Disturbed Physical environment	• Undertake a complete environmental restoration programme and introducing appropriate vegetation	• Management	
Solid waste	• Solid waste should be collected by a contracted waste collection company • Excavation waste should be re-used or backfilled.	• Contractor • Management	• Amount of waste on Site. • Presence of well-maintained receptacles and central collection point.

Occupational Health and Safety	• 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.	• Contractor	• 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 quarrying 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 quarrying 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 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 quarrying 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 quarrying 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 quarrying 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 in 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 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 Otjozondjupa Regional Council office and farm fences as well. Registered mail letters were also sent to the farm owners. A public meeting was held at Hochfeld on 25 September 2025, attend by both consultant and the proponent.

Interested and affected parties that were notified directly include farmers, government departments, regional council, Namwater, Chamber of Mines and individuals that may be affected by the quarrying activities. No negative concerns were received at this stage. Should any interested and affected parties raise any concerns during the on-going project phase, the Ministry of Environment and Tourism will be immediately notified. The registered interested and affected are indicated in the table below

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

Name	Position	Organization
Teofillus Nghitila	Executive Director	Ministry of Environment, Forestry and Tourism
Timoteus Mufeti	Environmental Commissioner	Ministry of Environment, Forestry and Tourism
Maria Amakali	Director, Water Resources Management	Ministry of Agriculture, Water and Land Reform
E. Shivolo	Mining Commissioner	Ministry of Mine and Energy

Registered IAP's and Summary of Issues Raised during the public meeting

Name	Organization	Tel	Email	Comments/Ouestions	Response
Hella Coetzee	Otjozondu	0812036454	omantumba@iway.na	1.How are you going to deal with security? 2.Will you employ local people 3.There is a tower at the mountain are you not going to destroy it?	1. Security company to be hired. Mining area to be completely fence. Access will be strictly limited to employees, contractors and collaborators. 2. Yes they plan is to employ up to 90% of local people. Only hire

				4.How many people will be at the mine and where are they going to stay 5. How will you deal with theft, hunting, by the employees at the farms? 6. There is other mining activities in the areas causing traffic impacts, dust and noise, you must control all these. 7. Community benefits 8. There is always lack of rehabilitation after mining. I suggest rehabilitation should be mapped. 9. The mining company must help with maintenance of road, or create alternative route to reduce the road impacts and traffic impacts.	non-locals in the cases where local people are not qualified for the job. 3. Thank you for bring it to our attention, this area will be avoided. 4. Approximately 50 people per mining license. We will provide accommodation near the site, in the farm. Distances to the nearest towns (Okahandja) make it unviable to commute on a daily basis. 5. We grantee employ with clean record and good conduct. Hunting will be strictly prohibited for the company, its employees, contractors, and any collaborators. 6.Thanks for your comment, the impacts will be well controlled. 7.Company to actively participate in community events, provide sponsorship and support. 8. Yes, that is true but we will do an agreement with the farmers and promise to do a full rehabilitation. 9. Thank you for the comment the company will definitely help with road maintenance, upgrading the road.
Fred Kars	Houmoed	0816909601	Drfred.agribus@gmail.com	1. What is your operational magnitude, amount of ton that you are going to mine? 2. Large mining operations affects groundwater source and this is the water we are using for farming. 3.. Accommodation	1.At this stage it is not yet clear on how many tons will be mined. 2. Thanks for the comment, we will try by all means to prevent the pollution of groundwater. Groundwater experts will conduct a bi-annual groundwater audit on site. 3. Company to provide accommodation nearby the site. Ablution facilities will obviously be made available.

Dirk Henholdt	Hochfeld	0816907876	dirk@hochfeld.com		
H.Fovsch	Eureka	0812536916	eureka@afol.com.na	1.It is good to provide us with the magnitude of operations as it determined the road impacts, and ground water impacts. 2. Mining duration	1.At this stage it is not yet clear on the magnitude of the operation but we will always share all the new information with all of the farmers and the community throughout the operation.
Y. Ritter	Woodstock	0812506633	york@thegoodoliveco.com	1.It is not only the farmers who has the mining licence located on their land are affected but all of the farmers in the area. Access to the mining area is concerns for all of us, road and traffic impacts, fencing, water management and all other impacts should be taken serious and addressed to all of us as it affect us all.	1.Thank you for the comment, we take note of that.
Rolf Heiser	Hochfeld Guesthouse	0811245940	Yolliheiser@gmail.com		

8. Conclusion

The scoping report is prepared for the Environmental Impact Assessment for quarrying on an area which is located about 140 km northeast of Okahandja, Otjozondjupa Region. Environmental scoping is a critical step in the preparation of an EIA for the proposed quarrying activities.

Basically, the extraction of manganese from its ores requires a combination of mining, beneficiation, and metallurgical processes, depending on the type of deposit and the quality of the ore. Manganese is an important element with diverse properties, historical significance, and industrial applications, playing a crucial role in various fields such as metallurgy, energy storage, and chemical manufacturing.

With the potential employment of 27 people, this means that 27 families will benefit from the project during the quarrying 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 quarrying site will be sourced from the proponent's own generator.

The potential negative impacts associated with the proposed quarrying 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.

9. References

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Appendix A

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

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

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

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

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

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

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

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

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

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

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

Appendix B: Proof of Advertisements, Letters and Notices

Appendix of CV's

CLASSIFIEDS

Tel: (061) 208 0800/44 Fax: (061) 220 584 Email: classifieds@nepc.com.na

Services
General

CLASSIFIEDS

Rates and Deadlines

• To avoid disappointment of an advertisement not appearing on the date you wish, please book timeously • Classifieds smalls and notices: 12:00, two working days prior to placing • Cancellations and alterations: 16:00, two days before date of publication in writing only

Notices
(VAT Inclusive)
Legal Notice N$460.00
Lost Land Title N$575.00
Liquor License N$460.00
Name Change N$460.00
Birthdays from N$200.00
Death Notices from N$200.00
Tombstone Unveiling from N$200.00
Thank You Messages from N$200.00

Terms and Conditions Apply.

Employment

NAMI PREFABRICATED HOUSING CC is the largest manufacturer of prefabricated panel houses in Namibia.

It has the following vacancies:

1. Technician for designing of polystyrene foam expansion and blocks manufacturing.

2. Sandwiches panels manufacturing and installation.

Requirements:
• The candidate should have 9 years of experience in modular housing industry and be able to communicate with and train local understudies.
• Chinese speaking ability will be an added value.

Those who meet the requirements will be more than welcome to send their supporting documents to:
namiprefab@gmail.com
Contact: 081-4835030
Closing date: 24/09/2024

Employment
Offered

LIXIANG INVESTMENT CC

is urgently looking for:

3 SITE MANAGERS

Requirements:
• Fluent Mandarin &basic English
both in Spoken and writing.
• Chinese Bachelor's degree or oversea study experience in Mining Engineering, Geology.
• 10+ years relevant working Experience on operating Marble cutting or Lip Channel
• Proficiency in computer skills.
• Conduct of certificate from police station
• Proficiency in driving and repairing Chinese brand trucks and mining equipment
Please send your CV to: hhpfelix@gmail.com

Close date: 05 OCT 2024

BLUESKY MINING CC

is urgently looking for:

2 SITE MANAGERS

Requirements:
1.Fluent Mandarin &basic English
both in Spoken and writing.
2. Chinese bachelor's degree or oversea study experience in Mining Engineering, Geology.
3. 10+ years relevant working Experience on operating Marble cutting or Lip Channel
4. Proficiency in computer skills.
5. Conduct of certificate from police station
6. Proficiency in driving and repairing Chinese brand trucks and mining equipment
2 MACHINE Engineers

Requirements:
• Fluent Mandarin & English both
in Spoken and writing.
• 8+ years relevant engineering working Experience on mining operation on site, rich experience on exploring and detecting mining resource with most advanced equipment.
• Basic computer skills.
• Conduct of certificate from police station
• Proficiency in driving and repairing Chinese brand trucks and mining equipment

Please send your CV to hhpfelix@gmail.com
Close date: 05 OCT 2024

PINE PHARMACY OSHAKATI

IS LOOKING FOR A RESPONSIBLE **PHARMACIST,**

WITH 2 YEARS POST INTERNSHIP EXPERIENCE AND REGISTERED WITH THE HPCNA.
PREFERENCE WILL BE GIVEN TO NAMIBIANS.

THE SALARY PACKAGE IS MARKET COMPETITIVE WITH BENEFITS.
EMAIL: pinepharmacy@iway.na

Closing date: 30-10-2024

Notice
Legal Notice

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 9576
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).
Location: The license area is located about 55 km east of Swakopmund. The proponent intends to explore for Uranium. Exploration methods may include geological mapping, geophysical surveys, sampling and drilling.
Proponent: SAA Investments CC
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 15/10/2025. Contact details for registration and further information:
Impala Environmental Consulting
Mr. S. Andjamba
Email: public@impalac.com,
Tel: 0856630598

IMPALA ENVIRONMENTAL

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 9629
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).
Location: The license area is located about 57 km northwest of Karibib. The proponent intends to explore for Uranium. Exploration methods may include geological mapping, geophysical surveys, sampling and drilling.
Proponent: Magdalena Appolus
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 15/10/2025. Contact details for registration and further information:
Impala Environmental Consulting
Mr. S. Andjamba
Email: public@impalac.com,
Tel: 0856630598

IMPALA ENVIRONMENTAL

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 9652
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).
Location: The license area is located about 20 km southeast of Walvis Bay. The proponent intends to explore for Uranium. Exploration methods may include geological mapping, geophysical surveys, sampling and drilling.
Proponent: Gideon Naggy Simon
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 15/10/2025. Contact details for registration and further information:
Impala Environmental Consulting
Mr. S. Andjamba
Email: public@impalac.com,
Tel: 0856630598

IMPALA ENVIRONMENTAL

Notice
Legal Notice

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MINERAL EXPLORATION ON EPL 9725
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).
Location: The license area is located about 21 km East of Swakopmund. The proponent intends to explore for Uranium. Exploration methods may include geological mapping, geophysical surveys, sampling and drilling.
Proponent: Gideon Naggy Simon
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 15/10/2025. Contact details for registration and further information:
Impala Environmental Consulting
Mr. S. Andjamba
Email: public@impalac.com,
Tel: 0856630598

IMPALA ENVIRONMENTAL

CALL FOR PUBLIC PARTICIPATION ENVIRONMENTAL IMPACT ASSESSMENT FOR MANGANESE MINING ON MINING LICENCE 263 & 241, OTJOZONDJUPA REGION
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).
Location: The license areas are located about 140 km northeast of Okahandja. The proponent intends to mine Manganese on the mining license.
Proponent: Wepex Mining Resources (Pty) Ltd
All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before 15/10/2024. A public participation meeting will be held on the 25th of September in Hochfeld Contact details for registration and further information:
Impala Environmental Consulting
Mr. S. Andjamba
Email: public@impalac.com,
Tel: 0856630598

IMPALA ENVIRONMENTAL

REPUBLIC OF NAMIBIA MINISTRY OF INDUSTRIALISATION AND TRADE, LIQUOR ACT, 1998
NOTICE OF APPLICATION TO A COMMITTEE IN TERMS OF THE LIQUOR ACT, 1998
(REGULATIONS 14, 26 & 33)
Notice is given that an application in terms of the Liquor Act, 1998, particulars of which appear below, will be made to the Regional Liquor Licensing Committee, Region:
OMUSATI
1. Name and postal address of applicant,
IMMANUEL LUVINGA
Name of business or proposed business to which applicant relates: **VW DEPOT**
Address/Location of premises to which Application relates:
KATUTURA LOCATION
ETAYI CONSTITUENCY
2. Nature and details of application:
WHOLESALE LIQUOR LICENSE
3. Clerk of the court with whom Application will be lodged:
OUTAPI MAGISTRATE COURT
6. Date on which application will be Lodged: **10 - 29 AUGUST 2024**
7. Date of meeting of Committee at which application will be heard:
09 OCTOBER 2024
Any objection or written submission in terms of section 28 of the Act in relation to the applicant must be sent or delivered to the Secretary of the Committee to reach the Secretary not less than 21 days before the date of the meeting of the Committee at which the application will be heard

Notice
Legal Notice

IN THE MAGISTRATE'S COURT FOR THE DISTRICT OF GOBABIS HELD AT GOBABIS.
CASE NO: 120/2021
In the matter between
HALFWAY FORD RSA
EXECUTION CREDITOR / PLAINTIFF
AND
EXECUTION DEBTOR / DEFENDANT
NOTICE OF SALE IN EXECUTION
In the pursuant of a Judgment granted by the Magistrate's Court on **1 MARCH 2021** the following movable property will be sold in execution by the Messenger of the Court for the district of GOBABIS on **FRIDAY the 25TH SEPTEMBER 2024 at 10h00** at **GOBABIS AUTO TRUCK AND TRACTOR, ROESNER STREET, GOBABIS,** cash to the highest bidder, viz:
1 RAVAGIOLI, 3 PHASE, 4 POST LIFT
1 INGERSOLRAND 2701, 3 PHASE COMPRESSOR
DATED AT GOBABIS on this 4th day of September 2024.
W H KEMPEN
KEMPEN - MASKE
LEGAL PRACTITIONERS
FOR EXECUTION CREDITOR / PLAINTIFF
40 CUITO CUANAVALE AVE
P O BOX 55
GOBABIS

IN THE MAGISTRATE'S COURT FOR THE DISTRICT OF GOBABIS HELD AT GOBABIS.
CASE NO: 113/2024
In the matter between
VANESSA VAN DER MERWE
EXECUTION CREDITOR / PLAINTIFF
AND
BARRY RUKORO
EXECUTION DEBTOR / DEFENDANT
NOTICE OF SALE IN EXECUTION
In the pursuant of a Judgment granted by the Magistrate's Court on **26 JUNE 2024** the following movable property will be sold in execution by the Messenger of the Court for the district of **GOBABIS** on **FRIDAY the 20TH SEPTEMBER 2024** at **10h00** at **KAROO OCHSE AUCTION PENS, GOBABIS,** cash to the highest bidder, viz:
6 HEAD OF CATTLE
DATED AT GOBABIS on this 3rd day of September 2024.
W H KEMPEN
KEMPEN - MASKE
LEGAL PRACTITIONERS
FOR EXECUTION CREDITOR / PLAINTIFF
40 CUITO CUANAVALE AVE
P O BOX 55
GOBABIS

REPUBLIC OF NAMIBIA MINISTRY OF INDUSTRIALISATION AND TRADE, LIQUOR ACT, 1998
NOTICE OF APPLICATION TO A COMMITTEE IN TERMS OF THE LIQUOR ACT, 1998
(REGULATIONS 14, 26 & 33)
Notice is given that an application in terms of the Liquor Act, 1998, particulars of which appear below, will be made to the Regional Liquor Licensing Committee, Region:
OMUSATI
1. Name and postal address of applicant,
IMMANUEL LUVINGA
Name of business or proposed business to which applicant relates: **VW BAR**
Address/Location of premises to which Application relates:
KATUTURA LOCATION
ETAYI CONSTITUENCY
2. Nature and details of application:
SHEBEEN LIQUOR LICENSE
3. Clerk of the court with whom Application will be lodged:
OUTAPI MAGISTRATE COURT
6. Date on which application will be Lodged: **10 - 29 AUGUST 2024**
7. Date of meeting of Committee at which application will be heard:
09 OCTOBER 2024
Any objection or written submission in terms of section 28 of the Act in relation to the applicant must be sent or delivered to the Secretary of the Committee to reach the Secretary not less than 21 days before the date of the meeting of the Committee at which the application will be heard

Notice
Legal Notice

PUBLIC NOTICE: ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE PROPOSED MINING OF BASE AND RARE METALS, PRECIOUS METALS AND SEMI PRECIOUS STONES ON MINING CLAIMS (MCs) NUMBER 75478,75479,75480,75481,75482,75483,75484,75485,75486,75487 AT OMAO, OKANGUNDUMBA CONSERVANCY, KUNENE REGION, NAMIBIA.

EnviroPlan Consulting cc hereby gives notice to all potential Interested and Affected Parties (I&APs), that an application for Environmental Clearance certificate will be made to the Environmental Commissioner in terms of the Environmental Management Act (No. 7 of 2007) as follows;

Proponent: New Horizon (PTY) Ltd JV Firmic Investments
Environmental Assessment Practitioner: EnviroPlan Consulting cc

Project Description: New Horizon (PTY) Ltd hereby referred to as the project proponent intends to undertake mining activities on Namibian registered mining claims (MCs) number 75478,75479,75480,75481,75482,75483,75484,75485,75486,75487 near Omao, Okangundumba conservancy, Kunene Region, Namibia. Proposed activities will include mining of base and rare metals, precious metals and semi-precious stones. Different appropriate mining methods will be used depending on the slope.

Project Location: Omao Village, Kunene Region, Namibia. Omao village is located approximately 70 km from Opuwo along the C43. It is within the Okangundumba Conservancy.

Public participation process: Interested and Affected Parties are hereby notified to attend a public meeting on the 17th of September 2024 at Opuwo Rural Constituency offices. The participation and commenting period is effective until 30th of September 2024.

To register or request for Background information documents, please submit your details in writing to the Environmental Consultant and contact details given on or before the 30th of September 2024.

EnviroPlan Consulting Environmental Consultant
Phone: +264 814 087482
info@enviroplanconsult.com

EnviroPlan Consulting cc
...innovative planning for sustainability

REPUBLIC OF NAMIBIA MINISTRY OF INDUSTRIALISATION AND TRADE, LIQUOR ACT, 1998
NOTICE OF APPLICATION TO A COMMITTEE IN TERMS OF THE LIQUOR ACT, 1998
(REGULATIONS 14, 26 & 33)
Notice is given that an application in terms of the Liquor Act, 1998, particulars of which appear below, will be made to the Regional Liquor Licensing Committee, Region:
OSHIKOTO
1. Name and postal address of applicant,
DANIEL HAUFIKU
Name of business or proposed business to which applicant relates: **DHF INVESTMENT BAR**
Address/Location of premises to which Application relates:
ONDIIFWANYA, OKAPYA, EENGODI
2. Nature and details of application:
SHEBEEN LIQUOR LICENSE
3. Clerk of the court with whom Application will be lodged:
TSUMEB MAGISTRATE COURT
6. Date on which application will be Lodged: **03 OCTOBER 2024**
7. Date of meeting of Committee at which application will be heard:
13 NOVEMBER 2024
Any objection or written submission in terms of section 28 of the Act in relation to the applicant must be sent or delivered to the Secretary of the Committee to reach the Secretary not less than 21 days before the date of the meeting of the Committee at which the application will be heard

PROPERTY

4 Eco-friendly upgrades that will increase the value of your home

Property experts highly recommend looking into the sustainability of your house and even your garden – not only for altruistic reasons but also because it can lower the cost of running your home and also has the potential to increase the resale value of the property too.

Solar will not only save on electricity costs and power your hot water needs but can power your home during power outages when properties and neighbourhoods become vulnerable.

Globally, the drive to more sustainable living has gained significant movement over the past years, says Seeff Property Group.

Locally too, Seeff says greening is gaining momentum, especially in and around homes. If you have not yet considered introducing green features into your home, then now is the time to start. Green features are not just a good investment but given the realities of the electricity and water crises, buyers are now likely to be swayed by these additions.

Turning the housing sector green is just one of the pillars of government's green economic strategy. Already, most new developments boast greening elements. Beyond just taking measures to reduce your carbon footprint and impact on the environment, the move to greening homes is a vital economic boost.

Adrian Goslett, Regional Director and CEO of RE/MAX of Southern Africa adds that making your property more sustainable can go a long way towards attracting buyers who value these conveniences and amenities.

"Whether buying new or improving your current environment, you can make your house more sustainable with some quick changes and some thoughtful investments to save on energy, water, and maintenance costs," says Goslett.

But, with so many sustainable options to choose from, it can be difficult to know what exactly you should be upgrading on your property. To help make this decision easier, RE/MAX suggest that homeowners consider four essential pillars for home sustainability; namely electricity, water, waste, and self-sustainability.

1. Invest in solar power

Homeowners should arrange for a consultation on whether the property can easily adapt to solar power panels. This will depend on your type of roof and its exposure to the sun. In the long run, running your property on solar power will save thousands off your electricity bill and will reduce the impact of relying on non-renewable energy sources.

2. Upgrade your water-efficiency

Those with solar power will be able to heat your water sustainably without reliance on the grid. However, there are many other ways to optimise the way that your property uses this resource.

For example, you could install a rainwater tank to reduce pressure on your local water supply systems and invest in waterwise shower heads in your bathrooms. It can also be as simple as adding a bucket to your shower to capture excess water for your garden, but if you invest in a proper greywater system to maintain your garden during times of drought, this could double as a way to invest in the resale value of the property.

3. Find out about local recycling

Look into your municipality's recycling guidelines and speak to your local estate agent to find out about where you're able to drop off recycling in your area. If you feel your neighbourhood is underserved, consider spearheading communications to introduce that recycling be collected from the households in your community for even more convenience.

4. Use your garden to be more self-sustainable

Those with the yard space should invest in creating a composting system to reduce the amount of waste the household creates. Investing in plants is also wonderful for naturally purifying the air, helping to dampen street noise, and can also provide shade to cool the home in summer, which in turn will lessen your property's reliance on non-natural and expensive cooling systems.

Planting your own fruit, vegetables, and herbs will also reduce your reliance on the local grocery which will reduce the amount of packaging waste your household produces.

"In South Africa, these green features are becoming increasingly popular among buyers, especially as a result of the ongoing load shedding and the prevalence of droughts in our country. Don't hesitate to speak to real estate professionals for advice on the best sustainable home improvements in your neighbourhood and for your specific type of property," says Goslett.

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-Property 24

Lupita Nyong'o says her new podcast will tell stories about African people. Photo: Bryan Bedder / GETTY IMAGES NORTH AMERICA / Getty Images via AFP

Lupita Nyong'o's new podcast for African stories, set to premiere in September

Lupita Nyong'o says her upcoming podcast, "Mind Your Own", is set to start this September.

Nyong'o says she has been working on the podcast for five years. It will be broadcast on Apple Podcasts, Amazon Music and Spotify.

In a post on Instagram, Nyong'o revealed that this podcast is a storytelling show that will feature stories from the African perspective.

"Forget about the hot button, newsworthy stories that you are used to hearing from the Continent! This show is about the personal, intimate, individual and quirky stories that give light to who we are as Africans today," said the model.

The actress also shared that she created "Mind Your Own" because she wanted to hear stories from other African people who are also navigating more than one world that they consider home like her.

"It's also for anybody who has ever felt alien in one way or another; for everyone considering what it really means to belong," she added.

In a snippet video, Nyong'o also said that in each episode of the podcast, she will also be telling stories from her personal life. Things that she has not shared with anyone before.

"This week, I announced my new podcast, MIND YOUR OWN. It is the most personal and revealing project I have ever created! (Insert pride, excitement and nerves here!). So here's a video to help get you in the zone of what you can expect to hear from this new storytelling show.

Follow Mind Your Own now via the link in bio so that you are the first to hear it when we debut globally on September 19!"

Actor Dick Van Dyke, 98, still 'looking for work'

Dick Van Dyke has said he is still "looking for work" as he approaches his 99th birthday.

The 'Mary Poppins' actor, who is set to mark the milestone on 13 December, made the gag after he won an award for outstanding variety special at the 2024 Creative Arts Emmy Awards for his 2023 birthday special 'Dick Van Dyke 98 Years of Magic'.

He told reporters after the event he wanted to be remembered "For laughter", adding about how he isn't thinking of retirement: "I hope for making people laugh for 75 years."

The actor continued to reflect on his career by saying: "I've been in the business 75 years. I can't believe that I'm still here and performing.

"I'm looking for work if anybody has."

Dick went on about the early days of his career: "You have to stick with it. You're gonna go through hard times and a lot of auditions... but you have to stay with it.

"Be patient if you've got the confidence in yourself, and it's very important to believe that you can do it."

In June, Dick stunned fans by performing with his Dick Van Dyke And The Vantastix band in Los Angeles.

The long-running singing quartet also featured his 52-year-old second wife Arlene Silver, who he married in 2012.

They put on the show after Dick made history earlier that month by becoming the oldest Daytime Emmy Award winner.-IOL

CALL FOR PUBLIC PARTICIPATION

ENVIRONMENTAL IMPACT ASSESSMENT FOR MANGANESE MINING ON MINING LICENCE 263 & 241, OTJOZONDJUPA REGION

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).

Location: The license areas are located about 140 km northeast of Okahandja. The proponent intends to mine Manganese on the mining license.

Proponent: Wepex Mining Resources (Pty) Ltd

All interested and affected parties are hereby invited to register and submit their comments regarding the proposed project on or before **15/10/2024. A public participation meeting will be held on the 25th of September in Hochfeld** Contact details for registration and further information:

Impala Environmental Consulting

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

IMPALA ENVIRONMENTAL

ATTENDANCE REGISTER

IMPALA ENVIRONMENTAL

EIA Public Meeting for ML 263 & 241 (Hochfeld)

DATE: 25 Sep 2024

NAME	ORGANISATION/ FARM	TELEPHONE	EMAIL	SIGNATURE
M. Hlasms				
H. Förtsch	Eureka	081-2536976	eureka@afol.com.na	H. Förtsch
F. KARS	HOUMOED	0816909601	dr fred.agribus@gmail.com	
I KARS	"	"	"	"
D Herholdt	Hochfeld	0816907876	dirk@Hochfeld Africa	
M. Ritter	Woodstock	0812506633	yorke@thegoodolivecc.com	
Hella Coetzee	Otjozondu	0812036481	omaruumba@iway.na	
Rolf Heiser	Hochfeld guesthouse	0811245940	rolliheiser@gmail.com	

PROFESSIONAL SUMMARY

A passionate environmentalist with 4+ years of field experience in multiple environmental roles. Expertise in Environmental Impacts Assessments, Data Collection & Analysis, Reports Writing, Environmental Laws, Water Managements and Waste Managements. Self-motivated with the skill to develop and foster creative and innovative solutions.

CONTACT

PHONE:
0818861611

EMAIL:
psevelinho@gmail.com

REFERENCES

1. Mr Simon Amagulu
Supervisor (City of Windhoek)
Cell: +264 81 2306398
2. Mr Riaan Oberholzer
(Warden at MET Walvisbay)
Tel: 064 205 971
Cell: +264 812971780
Email: Riaan.met@gmail.com

SEVERINUS ANDJAMBA

Environmentalist

EDUCATION

University of Namibia
03/2020
Bachelor of Science in Integrated Environmental Science (Honours)

Negumbo Senior Secondary School
11/2012
NSSC Grade 12

WORK EXPERIENCE

Impala Consulting, Environmental Assessment Practitioner
01/01/2021–Current
Roles: Provide environmental impact assessments (EIA), environmental scoping reports, and environmental management plans (EMPs) for any proposed developments. Compiling BID for different projects and engage in public meeting.

City of Windhoek, Intern for Water Resources Management
01/11/2022–30/06/2023
Roles: Monitoring boreholes - field data collection and entry for the Geohydrology Unit in the section

Ministry of Environment and Tourism, Intern
03/12/2018–11/01/2019
Role: Law enforcement, patrol of national park, extension work and refuse collection.

Outapi Town Council, Intern
12/12/2017-19/01/2018
Roles: Monitoring the dumping site to ensure safe waste disposal, educate community on solid & liquid waste management, conduct environmental/hygiene inspections, issues fitness certificates to businesses, extension work.

SKILLS

Environmental inspections
Water management
Environmental impact assessment
Field data collection
Report preparation and presentation

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:**

	Speaking	*Reading*	*Writing*
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 Practioner

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
• Project Local Consultant • Client Liaison	**Name of assignment or project:** Catchment Management Plan for the swakoppoort dam namibia **Year:** 2020 **Location:** Okahandja, Namibia. **Client:** Namwater

• Water Sampling and Reporting • Project Management • Project Supervision	**Main project features:** Catchment Management Plan for the Swakoppoort Dam. **Positions held:** Local Consultant **Activities performed:** Water Sampling, logistics, site inspections and report writing.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**Name of assignment or project:** Environmental Impact Assessment for the Development of a Tantalite Mine, Southern Namibia. **Year:** 2020 **Location:** Warmbad, Karas Region **Client:** Orange River Pegmatite (Pty) Ltd **Main project features:** Environmental Management **Positions held:** Lead Consultant **Activities performed:** Project Management, Report Writing, Public Participation, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**Name of assignment or project:** Environmental Impact Assessment for Proposed Development of A Medical Tourism University Hospital In Henties Bay **Year:** 2020 **Location:** Henties Bay, Erongo Region **Client:** Franco Civil Engineeering 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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**Name of assignment or project:** Environmental Impact Assessment for the Development of a Marble Mine. **Year:** 2020 **Location:** 10 km north of Karibib **Client:** Sunsand 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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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. **Year:** 2020 **Location:** 40 km northwest of Arandis **Client:** Rockstar 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.

• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation	**Name of assignment or project:** Environmental Impact Assessment for Dimension Stone Quarrying Activities on

• Report Writing • Project Management • Project Supervision	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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.

	Positions held: Lead Consultant **Activities performed:** Project Management, Report Writing, Public Meetings, Site Inspections, Stakeholder Engagement, Specialist Study Inputs and Map production.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.
• Project Leader • Client Liaison • Public Participation • Report Writing • Project Management • Project Supervision	**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.

Socio-economic Baseline and Impact Assessment EIA of the proposed Manganese Mine on ML 241 & 263

14 October 2024

Compiled by: Dr. Keo Halenyane

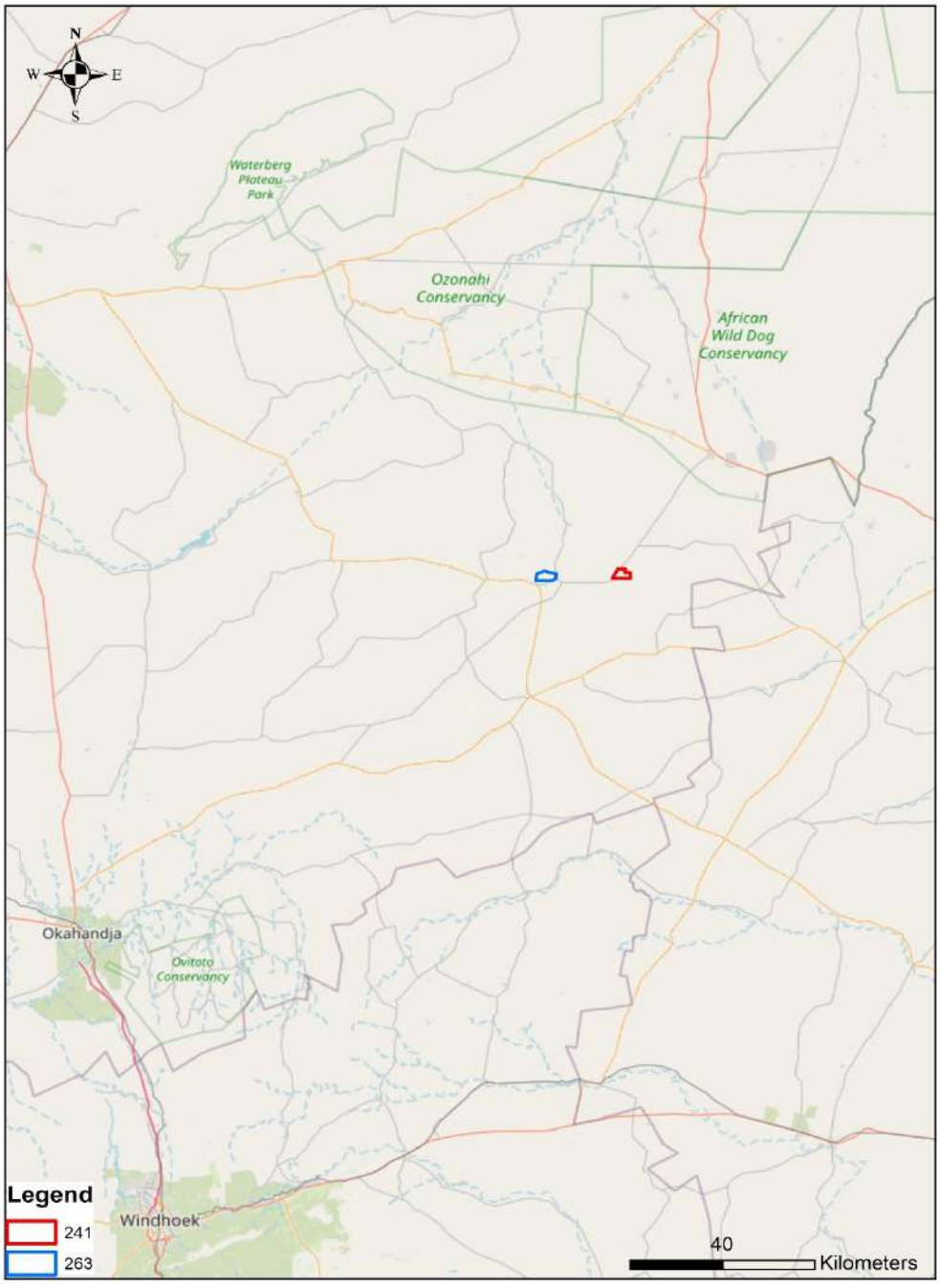
(Phd, Environmental Science, Uct)

Table of Contents

1 Introduction

Wepex Mining Resources Mining Resources (Pty) Ltd is in the process of advancing its Manganese Mine Project in Central Namibia, through its feasibility stages towards the development of a Manganese mine. The mining licence is located approximately 160 kilometers northeast of Okahandja town and about 130 kilometers north of Hosea Kutako International Airport.

Figure 1.1. Project Locality



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

Wepex 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 Wepex 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, Wepex Mining Resources Mining Resources (Pty) Ltd, applied for a mining licence, with the Ministry of Mines and Energy. The proponent intends to mine Manganese 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 Manganese 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

Otjozondjupa is one of the fourteen regions of Namibia. It's capital is Otjiwarongo. The region further contains the municipalities of Okahandja and Grootfontein and the towns Okakarara and Otavi. As of 2020, Otjozondjupa had 97,945 registered voters. A landmark within this region is the Waterberg Plateau Park. Twenty-four kilometres west of Grootfontein lies the huge Hoba meteorite. At over 60 tons, it is the largest known meteorite on Earth, as well as the largest naturally occurring mass of iron known to exist on the planet's surface.

In the east, Otjozondjupa borders the North-West District of Botswana. Otjiwarongo, Grootfontein, Otavi, and Okahandja are linked by rail and by the main B1 and B8 trunk roads running from south to north. Communication systems in these areas are also of a high standard.

The farming activities of Okahandja and Otjiwarongo are homogeneous as these parts are well known for cattle farming. The Otavi and Grootfontein districts, and to a lesser extent also Otjiwarongo, are the granary of Namibia. The region also has a great potential to establish industries connected with such farming activities and by-products of it. It further has the advantage of combining communal and commercial farming in the same region.

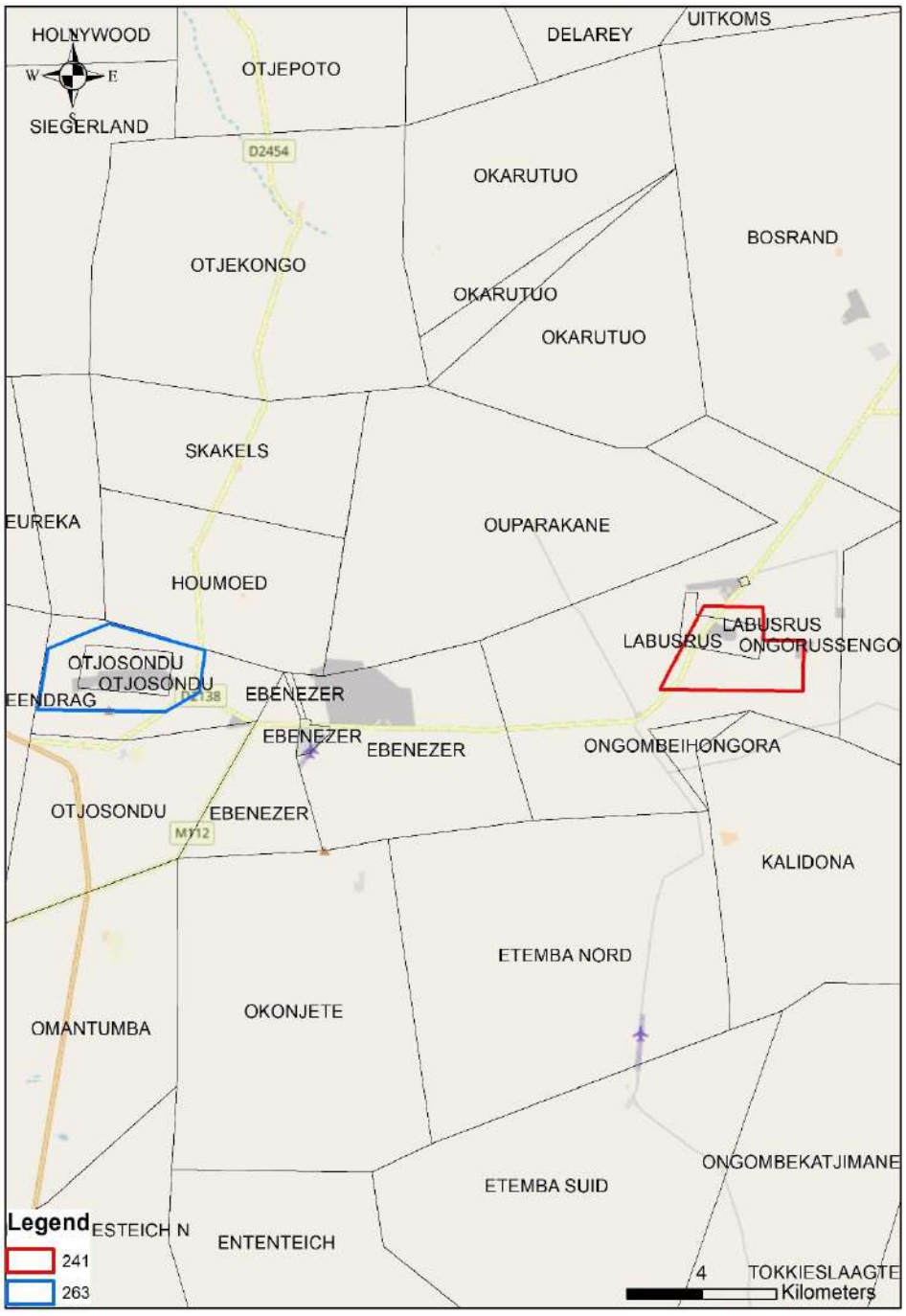
According to the 2012 Namibia Labour Force Survey, unemployment in the region is 25.3%. Otjozondjupa has 72 schools with a total of 36,284 pupils.

4. The Affected Community

4.1 Neighbouring landowners and farmworkers

The proposed mine will be surrounded by commercial farms which are mostly used 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 farms which may be affected.

Figure 4.1. Location of EPL and surrounding area.



4.2 Okahandja

Okahandja is the capital town of the Otjozondjupa 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 Okahandja 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 Okahandja’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 Otjozondjupa River before the location's name was changed to Okahandja.

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

There are the following organizations and offices in the town: Okahandja Police Station, Okahandja District Hospital, Ministry of Home Affairs (Department of Civic Affairs / Regional Civic Registration Office / Otjozondjupa Region) and Okahandja Department of Works. Okahandja 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 Otjozondjupa Region is tourism.

4.3 Otjozondjupa Regional Council

The Otjozondjupa 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

The Otjozondjupa 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. Otjozondjupa is re relatively under-developed, but with the potential for agriculture, tourism, mining and logistical development.

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 Otjozondjupa Regional Council's Strategic Plan 2009 - 2014 aims to ensure that Otjozondjupa 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), CENORED/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 2024

Socio-economic issues and concerns raised by Interested and Affected Persons during the EIA scoping phase in 2024 are summarised below:

Social Issues

a) How can the community expect to benefit?
b) What are the employment and training opportunities for local people?
c) Need for improved communications with stakeholders.
d) 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 Ombundsman 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 standards[1] 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 client[2] 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 Standards[3]

	Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts;
	Performance Standard 2: Labour and Working Conditions;

[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

□	Performance Standard 3: Resource Efficiency and Pollution Prevention;
□	Performance Standard 4: Community Health, Safety and Security;
□	Performance Standard 5: Land Acquisition and Involuntary Resettlement;
□	Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources;
□	Performance Standard 7: Indigenous Peoples; and
□	Performance Standard 8: Cultural Heritage.

Wepex wishes to conform to IFC standards and notes where it is compliant with social issues and where actions are required to be compliant in the future.

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.	Wepex 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	Wepex 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.	Wepex has bought Farm and bordering settlements and has retained the few farm workers who were previously employed on those settlements.

PS-6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.	PS-6 Refer to other specialist studies.
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.	There are no indigenous people, such as the Ju/'hoansi San, on the Wepex settlements although some may live and be employed on neighbouring settlements. The public participation process should aim to reach farm workers in the area.
PS-8 recognises the importance of cultural heritage for current and future generations.	Some graves have been found which will be addressed by the archaeological specialist. The village area have no other specific cultural value.

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 Principles[4] 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

Principle 1:	**Review and Categorisation** 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.
Principle 2:	**Social and Environmental Assessment**

[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.
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-terms strategic framework for developing the country as well as the development strategies and plans of the Otjozondjupa 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 build 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 Manganese 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*

[11] 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- 2017[5], 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 place[7].

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 pillars[8]:

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

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

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[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).*

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 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, Manganese, Manganese, 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 2025. 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 2024 – 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 2025 – 25% of discretionary expenditure
- From 2025 to end 2029 – 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.

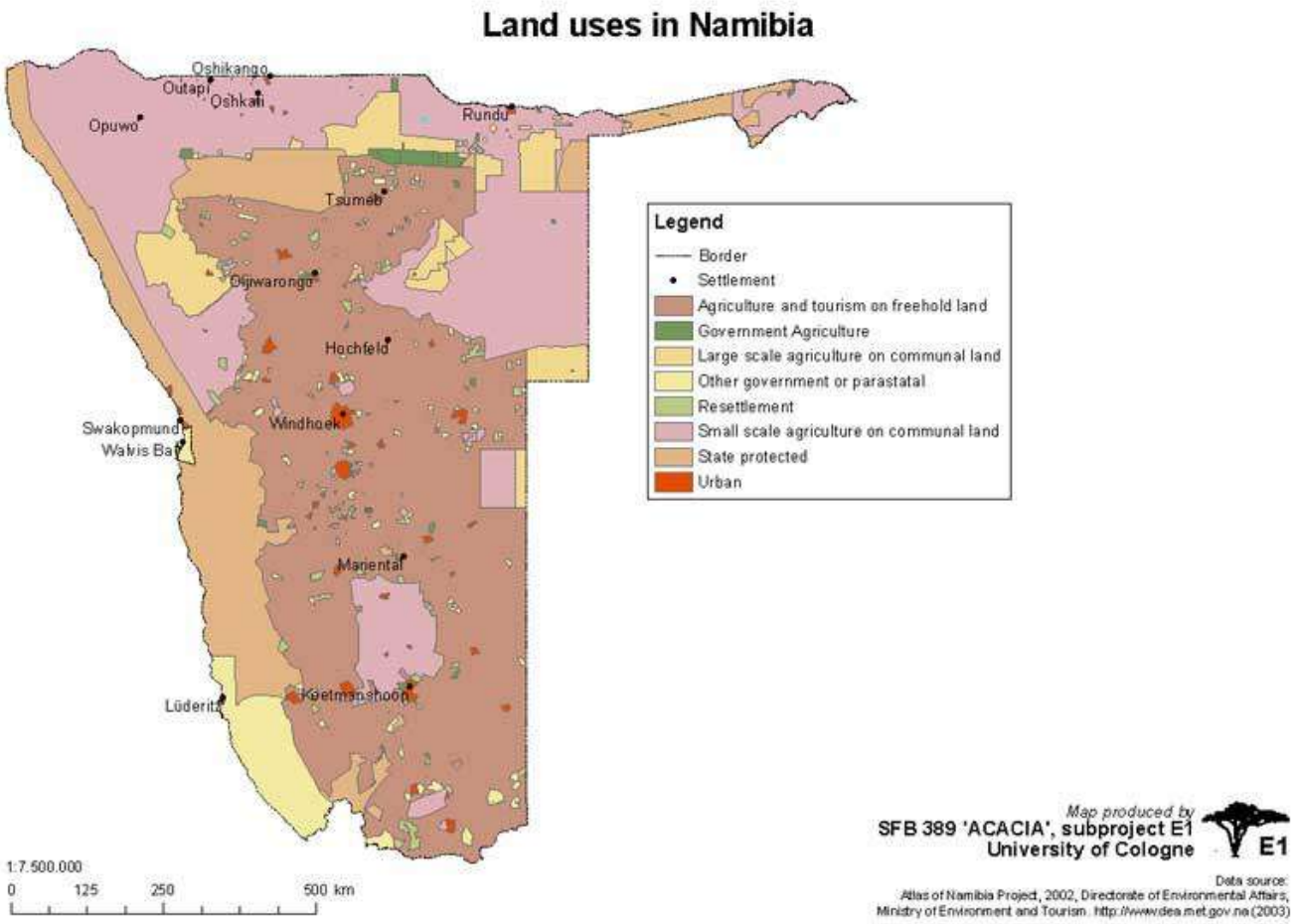
6. The Socio-economic Context

6.1 Land use

6.1.1 Freehold land

Land use in the area around mine is predominantly agriculture, consisting primarily of livestock farming with some game hunting (**Figure 6.1**). Agriculture is an important source of employment accounting for almost 30% of employment in Otjozondjupa.

Figure 6.1. Land Uses of Namibia



Tourism is a rapidly growing sector of the Namibian economy and a significant generator of employment. Although the majority of Namibia's international visitors originate in the region, other international travellers are increasingly attracted by the country's unique mix of political stability, cultural diversity and geographic beauty. Tourism in Namibia has had a positive impact on resource conservation and rural development.

The region benefits from some overnight tourists as it is on the main road between Okahandja and the Etosha National Park and other parks in the north east of the country.

The Otjozondjupa Region hosts many small-scale mine operations.

6.2 Labour and income

The labour force in Otjozondjupa is approximately 150,000 people, of whom about 100,000 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 Otjozondjupa 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 rearing[23].

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 (MGECW) 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

Okahandja has three primary schools: Okahandja 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.

Okahandja 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.

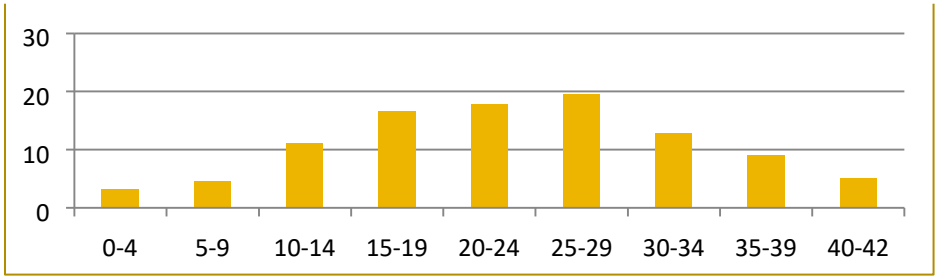
Kharob Secondary School was originally a primary school and has expanded to offer Grade 12 ordinary level and higher level in Science, Biology and Geography. Of the 70 matriculates in 2010, about 55% passed. Through the US Government funded Millennium Challenge Account (MCA), Khorab school will be extended 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 Okahandja 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 Okahandja area attend school in Tsumeb, 63km north of Okahandja.

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 2008[10]. 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 abilities[11].

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 2010[12][13]. **Figure 6.5** shows the % of learners who attained levels in the Junior Secondary Certificate (grade 10) in 2009 in Otjozondjupa Region where the region performed better than both Khomas and Omaheke regions[38].

Figure 6.5. % of learners attaining point ranges (0-42) in the JSC examination in 2020



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		

PA RT 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 Wepex Manganese mining was livestock farming. 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. Wepex 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 Wepex 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
[redacted]	[redacted]	[redacted]	[redacted]	
Activity: exploration & design	Activity/constructing the mine	Activity/mining	Activity/dismantling	

Assessment of impact

The closest direct neighbouring area is the Hochfeld 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

Wepex 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.
- Wepex 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, Wepex 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
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			

Foreman – electrical, drill, shovel, truck & equipment maintenance	6	2	2	2
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		

Plant Metallurgist	Process Plant - Day Shift	7	1
Safety Officer	Process Plant - Day Shift & Mine	7	1
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	4
Attendant	Process Plant - Milling & Gravity	3	4
Operator	Process Plant - Milling & Gravity	2	4
Supervisor	Process Plant - Milling & Gravity	3	8
Attendant	Process Plant - Leach Section & Thickeners	4	1
Operator	Process Plant - Leach Section & Thickeners	2	4
Operator	Process Plant - CIP, Residue & Elution	3	8
Attendant	Process Plant - Smelt House	3	8
Supervisor	Process Plant - Smelt House	2	3
Foreman	Process Plant - Smelt House	5	1
Fitters	Process Plant - Engineering	5	1
Electricians	Process Plant - Engineering	5	5
Instrument Technicians	Process Plant - Engineering	5	3
Boiler Makers & Welders	Process Plant - Engineering	5	3
Engineering Assistants	Process Plant - Engineering	5	4
Shift Leader	Process Plant - Asset Protection	2	7
Reviewer	Process Plant - Asset Protection	4	5
Asset Protection Officer	Process Plant - Asset Protection	4	1
		4	8
Occupation	**Department**	**Grade**	**Number**
Senior Asset Protector	Process Plant - Asset Protection		

Laboratory & Sample Preparation Total Staff		4	8
	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 Storm[14] 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 Manganese 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 Otjozondjupa 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 Wepex 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.

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

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+
Enhanced	H+	H	H	H+	H	H+

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.

Wepex 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 Okahandja. 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, Wepex 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 Wepex'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. Wepex 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 Okahandja town councils to diversify their economic activities.

8.5 Impact: In-migration

Project phase and link to activities/infrastructure

Construction	Operational	Decommissioning	Closure
[redacted]	[redacted]		
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 Okahandja 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, Okahandja'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, Okahandja has suffered out-migration and now has half the population it recorded ten years ago. By contrast, Okahandja has grown by 10,000 people. Although every town council wishes a wealthy, rate-paying population, numbers are important to generate economic activity. Okahandja Council is actively wooing Wepex to base its operations in Okahandja and it is likely to be happy to have any in-migration to boost its population. Okahandja 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 Okahandja. Wages and salaries will be injected into the local economy where they live; hence Okahandja's eagerness to have the town as Wepex'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

- Wepex 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 Otjozondjupa Region. Such employees would then rent accommodation in Okahandja.
- Wepex's Corporate Social Investment (CSI) strategy recommends support to local economic development in Okahandja 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 Wepex 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 Otjozondjupa 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, Wepex should partner the National Housing Action group (NHAG) and the Shack Dwellers Federation (SHDF) to enable residents in Okahandja's informal settlement to negotiate with their town council and to help themselves.
- Wepex 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.

- Wepex 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 Okahandja Community Trust renovated the government health clinic in Okahandja in 2010. In-migration to Okahandja due to this project may require Wepex to also contribute to upgrading the government facility.
- Wepex has already begun to support Okahandja 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 over-crowding, 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. Wepex 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.
- Wepex 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. Wepex 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

- Wepex must maintain appropriate fire control measures throughout the farm 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 Okahandja as the housing base

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

The choice of Okahandja 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, Okahandja 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 Okahandja but they will need commitment from Wepex before they invest in Okahandja.

Wepex's presence in Okahandja will not make a significant impact on the town but if it encourages many employees to be based in Okahandja, 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.

Wepex 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 Okahandja than Okahandja. The likely scenario is that the aspiring middle and professional classes will want to live in Okahandja while some of the less skilled employees may prefer to live in Okahandja as housing may be cheaper.

Wepex 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 Otjozondjupa 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 Okahandja for employment, as entrepreneurs, in search of jobs or simply as camp

followers. Wepex must work closely with both the Okahandja town councils to manage in-migration as it is the most serious negative impact which can create further unwanted impacts. Wepex 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 CULTURAL HERITAGE IMPACT ASSESSMENT REPORT FOR A PROPOSED MINE DEVELOPMENT DELINEATED UNDER EPL 7405 and 7406 (MINING LICENCE 241 & 263), OKAHANDJA, OTJOZONDJUPA REGION.

Compiled by:

Kaarina Shagwanepandulo Efraim (Bachelor of Arts Honours Degree in History and Sociology - UNAM), (Post Graduate Diploma in Secondary Education Bachelor - IUM) (Masters in Archaeology -UP).

Prepared for:

Mining Licence (ML)	Proponent
ML 242	Wapex Mining Resources (Pty), Ltd
ML 263	Wapex Mining Resources (Pty), Ltd

Table 1: Project Details

Item	**Description**
Proposed development and location	Wapex Mining Resources (Pty), Ltd **(The Proponent)** intends to carry out mining activities of Manganese (Base and Rare Metals) on Mining Licenses (ML) No. 241 & 263. The two MLs are located about 140km (241) and 126km (263) northeast of Okahandja, Otjozondjupa Region. The MLs cover a surface area of 638.2 hectares (241) and 823.2 hectares (263) respectively.
Title	**ARCHAEOLOGICAL AND CULTURAL HERITAGE IMPACT ASSESSMENT REPORT FOR MANGANESE MINING ON MINING LICENCE 241 & 263, OTJOZONDJUPA REGION, NAMIBIA**
Purpose of the study	The purpose of this document is an Archaeological and Heritage Impact Assessment report that describes the cultural values and heritage factors that may be impacted by the proposed mining activities.
Coordinates Municipalities	The two MLs are centered at: ML 241: 21° 14’ 02’’S 18° 02’ 25’’E ML 263: 21° 14’ 25’’S 17° 52’ 52’’E
Predominant land use of the surrounding area	Farming and Mining
Heritage Consultant	**Omapipi Tageya Archaeological and Heritage Consultants cc (Reg No: cc/2021/2930**
Author(s) identification	**Kaarina Shagwanepandulo Efraim**

In terms of land ownership, the land - use of the two mining licenses is located on commercial land: Farm Labusrua (ML 241) and Farm Otjosundu (ML 263)

Copyright

Authorship: This A/HIA Report has been prepared by Ms. Kaarina Shagwanepandulo Efraim. The report is for the review of the National Heritage Council of Namibia.

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

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

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

The Archaeological and Heritage Impact Assessment Study was carried out within the context of tangible and intangible cultural heritage resources as defined by the National Heritage Council Regulations and Guidelines as to the authorisation of the proposed mining project being proposed Wapex Mining Resources (Pty), Ltd

DECLARATION

We hereby declare that we do:

1. Have knowledge of and experience in conducting archaeological assessments, including knowledge of Namibian legislation, specifically the National Heritage Act (27 of 2004), as well as regulations and guidelines that have relevance to the proposed activity;

2. Perform the work relating to the application in an objective manner, even if this results in views and findings that are not favorable to the applicant;

3. Comply with the aforementioned Act, relevant regulations, guidelines, and other applicable laws. We also declare that we have no interest or involvement in:
   (i) the financial or other affairs of either the applicant or his consultant; and
   (ii) the decision-making structures of the National Heritage Council of Namibia.

Signed by:

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Executive Summary

An archaeological impact assessment was carried out for Wapex Mining Resources (Pty), Ltd focusing on the proposed MLs 241 and 263 for a mine development (construction, mineral extraction, ore processing operations) delineated under EPLs 7405 and 7406 which are located about 140 km (ML 241 and 126km (ML 263) northeast of Okahandja, Otjozondjupa Region and in close proximity to each other. The assessment therefore reviewed the archaeological records, historical documents from the previous studies surrounding the area, interviews with locals and all interested and affected parties, GIS spatial data, and field survey as a basis of inference regarding the archaeological and heritage significance of the project site, and their likely sensitivity to be disturbed in the course of quarrying activities. The field survey located and recorded a couple of heritage significant sites within the boundaries of ML 241 including previous mining compounds, and a burial site. There were no archaeological and heritage-significant sites recorded within the boundaries and in the vicinity of ML 263. The above-mentioned sources were used to conclude that damage or disturb sites or materials protected under the National Heritage Act (27 of 2004) are likely to occur if the. Thus, the proponent is highly advised to adopt the Chance Finds Procedure attached as Appendix 1 to this report as chances are high that buried archaeological remains could come to light during the mining phase.

Table 2: Acronyms and Definitions table

Abbreviation	Description
AIA	Archaeological Impact Assessment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
LIA	Late Iron Age
NHA	Nation Heritage Act, Act 27 of 2004
SM	Site Manager
NHCN	National Heritage Council of Namibia
ESA	Later Stone Age
MINING LICENCES	Exclusive Prospecting License
ECC	Environmental Clearance Certificate
CFP	Chance Find Procedure
EMA	Environmental Management Act

Key Concepts and Terms

Periodization Archaeologists divide the different cultural periods according to the dominant material found for the different time periods. This periodization is usually region-specific, such that the same label can have different dates for different areas. This makes it important to clarify and declare the periodization of the area one is studying.

These periods are nothing a little more than convenient time brackets because their terminal and commencement are not absolute and there are several instances of overlap. In the present study, relevant archaeological periods are given below;

Early Stone Age (~ 2.6 million to 250 000 years ago)

Middle Stone Age (~ 250 000 to 40-25 000 years ago)

Later Stone Age (~ 40-25 000, to recently, 100 years ago)

Early Iron Age (~ AD 200 to 1000)

Late Iron Age (~ AD1100-1840)

Historic (~ AD 1840 to 1950, but a Historic building is classified as over 60 years old)

Definitions Just like periodization, it is also critical to define key terms employed in this study. Most of these terms derive from Namibian National Heritage legislation and its ancillary laws, as well as international regulations and norms of best practices. The following aspects have a direct bearing on the investigation and the resulting report:

Cultural (heritage) resources are all non-physical and physical human-made occurrences, and natural features that are associated with human activity. These can be singular or in groups and include significant sites, structures, features, Eco facts, and artifacts of importance associated with the history, architecture, or archaeology of human development.

Cultural significance is determined by means of aesthetic, historical, scientific, social, or spiritual values for past, present, or future generations.

Value is related to concepts such as worth, merit, attraction, or appeal, concepts that are associated with the (current) usefulness and condition of a place or an object. Although significance and value are not mutually exclusive, in some cases the place may have a high level of significance but a lower level of value. Often, the evaluation of any feature is based on a combination or balance between the two.

Isolated finds are occurrences of artifacts or other remains that are not in situ or are located apart from archaeological sites. Although these are noted and recorded, but do not usually constitute the core of an impact assessment, unless they have intrinsic cultural significance and value.

In-situ refers to material culture and surrounding deposits in their original location and context, for example, an archaeological site that has not been disturbed by farming.

Archaeological sites/materials are remains or traces of human activity that are in a state of disuse and are in, or on, land and which are older than 100 years, including artifacts, human and hominid remains, and artificial features and structures. According to the Namibia National Heritage Act (NNHA) (Act No. 27 of 2004), no archaeological artifact, assemblage, or settlement (site) and no historical building or structure older than 60 years may be altered, moved or destroyed without the necessary authorization from the National Heritage Council or a provincial heritage resources authority.

Historic materials are remains resulting from human activities, that are younger than 100 years, but no longer in use, including artifacts, human remains, and artificial features and structures.

Chance finds mean archaeological artifacts, features, structures, or historical remains accidentally found during development.

A grave is a place of interment (variably referred to as burial) and includes the contents, headstone, or other marker of such a place, and any other structure on or associated with such place. A grave may occur in isolation or in association with others where it is referred to as being situated in a cemetery (contemporary) or burial ground (historic).

A site is a distinct spatial cluster of artifacts, structures, and organic and environmental remains, as residues of past human activity.

Heritage Impact Assessment (HIA) refers to the process of identifying, predicting, and assessing the potential positive and negative cultural, social, economic, and biophysical impacts of any proposed project, which requires authorization of permission by law and which may significantly affect the cultural and natural heritage resources. Accordingly, an HIA must include recommendations for appropriate mitigation measures for minimizing or circumventing negative impacts, measures enhancing the positive aspects of the proposal, and heritage management and monitoring measures.

The impact is the positive or negative effects on human well-being and/or on the environment.

Mitigation is the implementation of practical measures to reduce and circumvent adverse impacts or enhance the beneficial impacts of an action.

Mining heritage sites refer to old, abandoned mining activities, underground or on the surface, which may date from the pre-historical, historical, or relatively recent past.

Study area or 'project area' refers to the area where the developer wants to focus its development activities (refer to plan).

Phase I studies refer to surveys using various sources of data and limited field walking in order to establish the presence of all possible types of heritage resources in any given area.

1.0 Introduction

Mining is the backbone of the Namibian economy contributing about 10.1% to the Gross Domestic Product (GDP) in 2020. In 2017 Namibia was ranked as the sixth most attractive destination in Africa in the Fraser Institute Survey of mining companies. According to a presentation by the Chamber of Mines's Chief Executive Officer, as of 2020, the country fell to 47th position in Africa, this was reportedly due to investors' concern over the availability of labour/skill, regulatory duplication and inconsistencies, and challenges with input VAT refunds for companies (https://chamberofmines.org.na/annual-reviews/). At the end of 2013, a 52.7% contribution in export earnings was recorded for the mining industry in the Chamber of Mines Annual Report.

It is against this background that Wapex Mining Resources (Pty), Ltd herein referred to as the proponent) intends to mine Base and Rare Metals (Manganese) on the mining license 241 and extract Base and Rare Metals, Industrial Minerals and Precious Metals on mining license 263 in the northeast of Okahandja, Otjozondjupa Region. The laws of the Republic of Namibia are clear regarding this, that it requires an Environmental Clearance Certificate (ECC). Such a certificate is issued in line with the Environmental Management Act of 2007 (EMA). The proponents have appointed Impala Environmental Consulting cc to carry out an Environmental Impact Assessment (EIA) study to obtain an Environmental Clearance Certificate as per the requirements of the Ministry of Mines and Energy (MME) and the Ministry of Environment, Forestry and Tourism (MEFT) in terms of mining activities and clearance of land.

In this respect, Impala Environmental Consulting cc has then undersigned OTAH Consultancy cc to provide an archaeological and cultural heritage impact assessment as envisaged under the provisions of the National Heritage Act (27 of 2004). This report presents the results of an archaeological/heritage field survey of the area, focusing on MLs 241 & 263. The report suggests recommendations and mitigation measures that would be in keeping with the applicable laws and policies governing the preservation of archaeological remains in Namibia.

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

the Environmental Management Act, Act No. 7 of 2007. The main thrust of the provisions of the aforementioned legislation is to protect and salvage cultural/ archaeological and environmental resources from potential destruction resulting from mining activities.

It was against this backdrop that an Archaeological Impact Assessment (AIA) was carried out on mining licenses 241 & 263 to fulfil the following objectives:

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

1.2 Project Location

The proposed mining project will take place on MLs 241 and 263 which are located about 140 km (ML 241 and 126km (ML 263) northeast of Okahandja, Otjozondjupa, Namibia, see Figures 1 & 2 below. The two mining licenses cover a surface area of 638.2 hectares (241) and 823.2 hectares (263) respectively. The mining licenses are located on farms: Labusrua (ML 241) and Farm Otjosundu (ML 263).

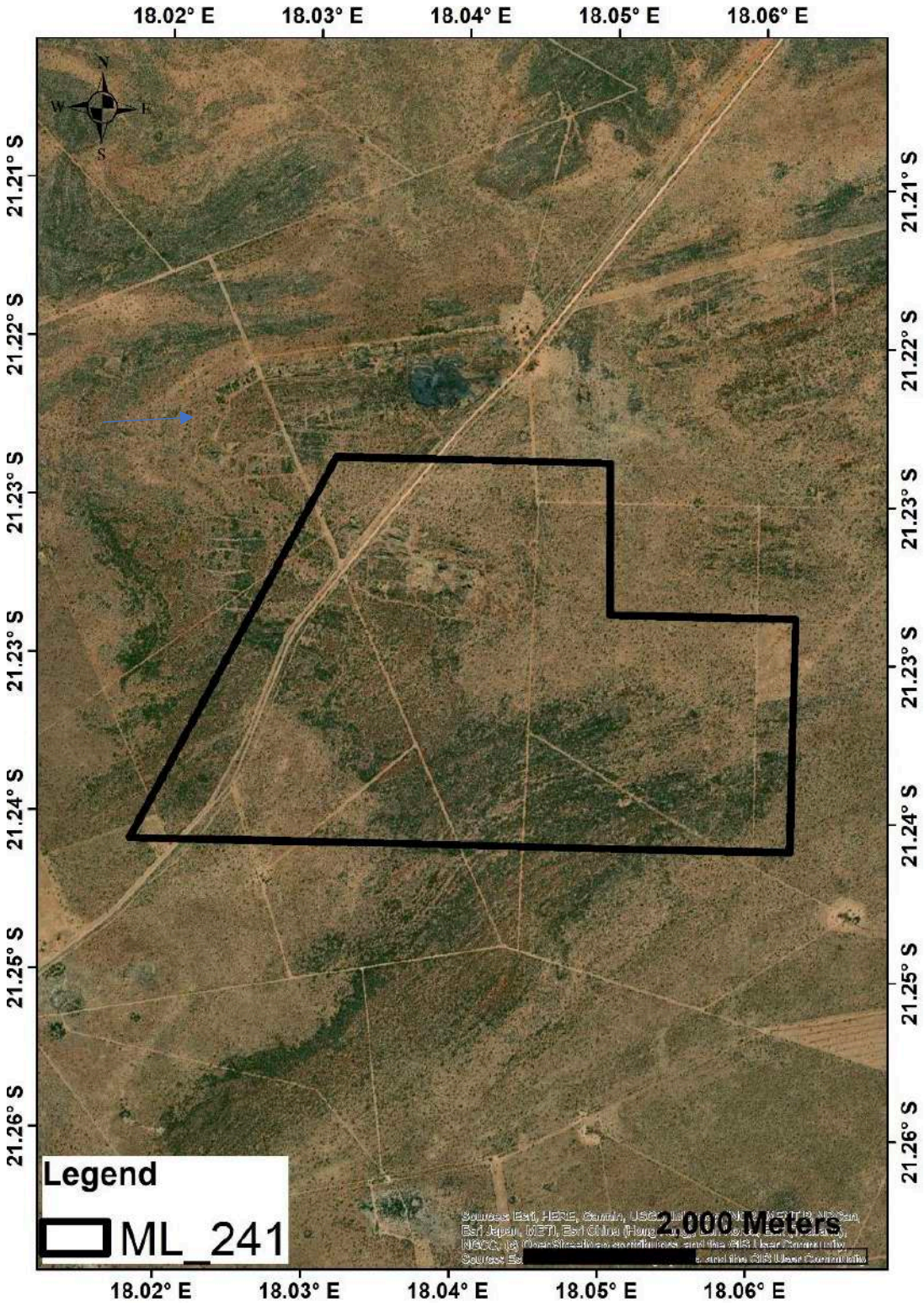

Figure 1: Locality of ML 241 - the proposed mining area (Map credits: Google earth 2024)

Figure 2: Locality of ML 241 - the proposed mining area (Map credits: Google earth 2024)

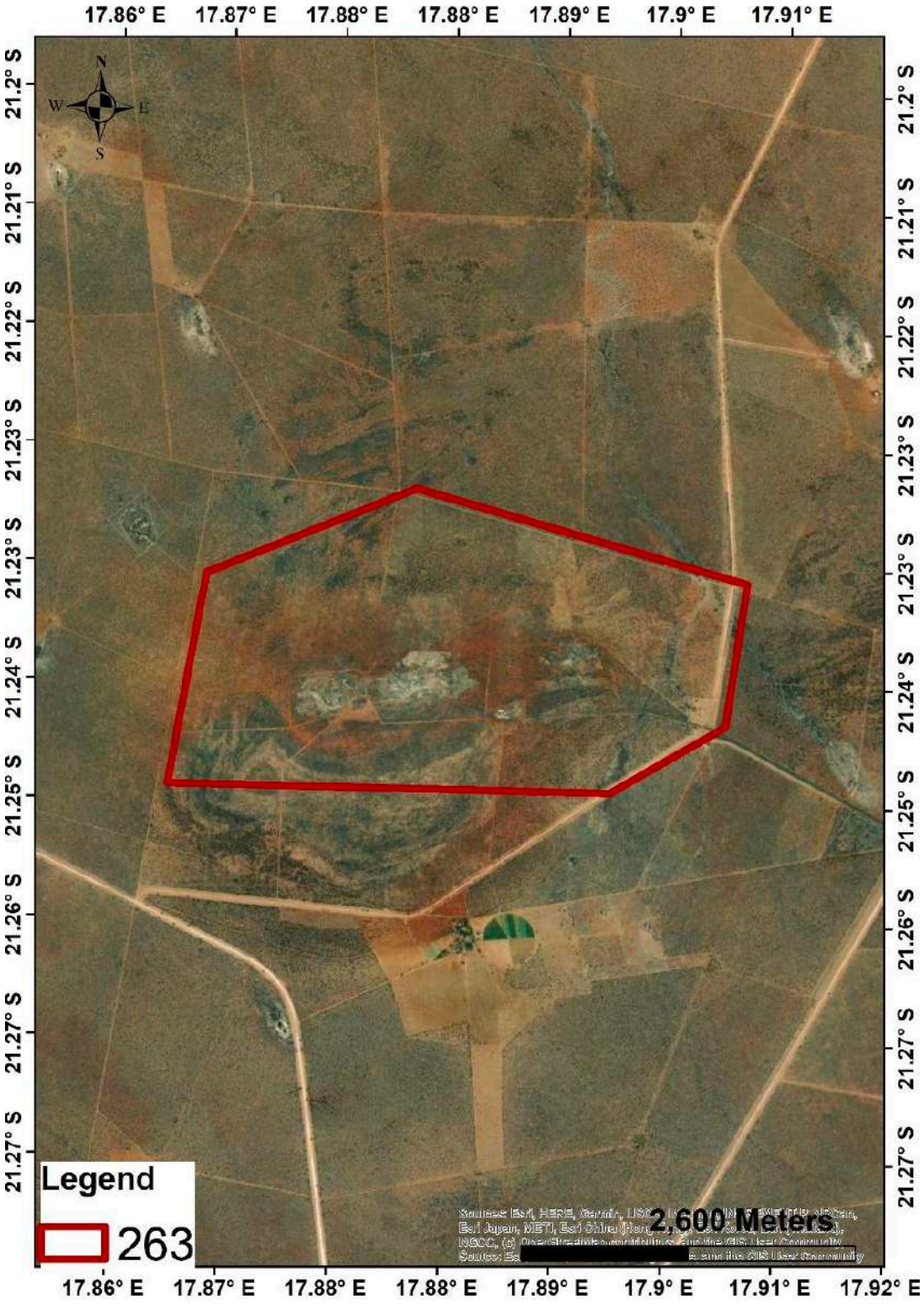

Figure 3: Locality of ML 263 - the proposed mining area (Map credits: Google earth 2024)

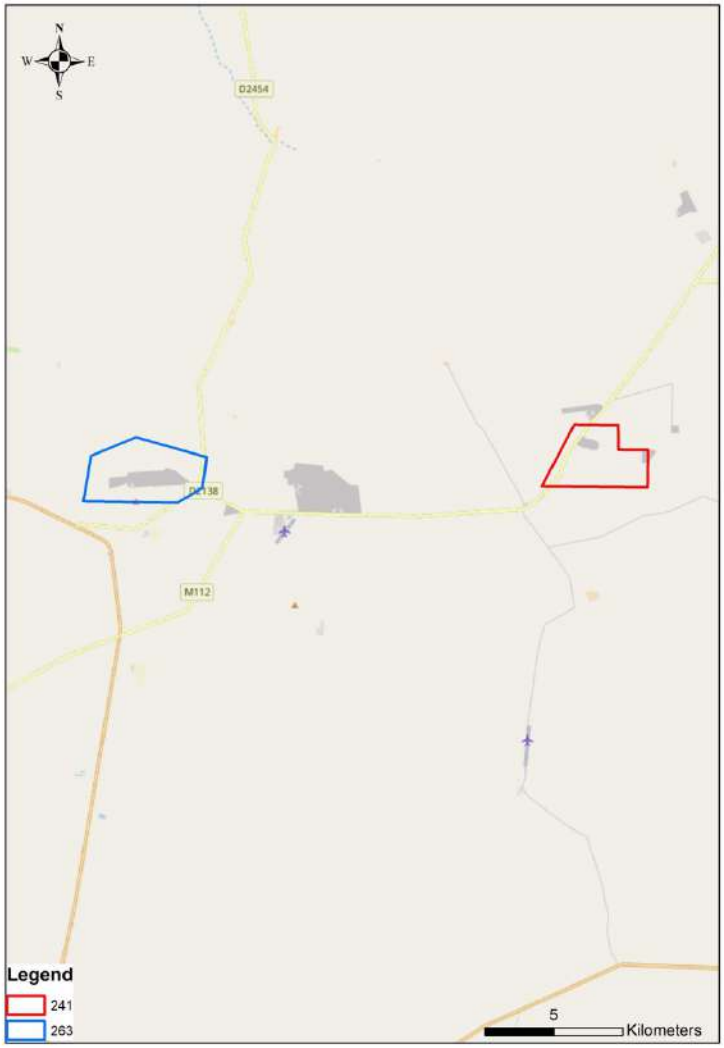

Figure 4: The two proposed mining licenses on one map (Photo credit: Impala Environmental Consulting cc 2024).

1.1 Project Description

The proponent intends to develop a mine in the Okahandja district; therefore, they propose to conduct the extraction of Manganese on mining licenses 241 and Otjozondjupa extract Base and Rare Metals, Industrial Minerals and Precious Metals on mining license on mining licence 263. The Proponent intends to extract Manganese from the area for commercial purposes. The proposed

mine will implement an open-cast mining method which is one of the common methods used to extract minerals from the earth. Excavators will be used to access and remove the overburden in order to access the underneath ore bodies

2.0 Legislations

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

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

3.0 Approach to Study

3.1 Terms of Reference

The main task of the archaeological survey and assessment was to identify and record all sensitive archaeological sites within the limits of mining licenses 241 & 263 that could be negatively affected by the proposed mining activities by Wapex Mining Resources (Pty), Ltd. The assessment also intended to establish the heritage significance of possible resources and assess their vulnerability, estimate the extent of the possible impacts, and establish mitigation measures. This

study is intended to satisfy the requirements of the Environmental Management Act (7 of 2007), and those of the National Heritage Act (27 of 2004).

3.2 Methodology

This Heritage & Archaeological Impact Assessment followed desktop-based assessments and field surveys, supplemented by oral interviews. These methodologies are standards for environmental and heritage assessment in Namibia, which are in line with international best practices. Desktop information was fashioned from current and existing heritage archives. These were taken from existing heritage records comprising those from the National Heritage Council, National Museum of Namibia, archaeological GIS spatial data, and records that have been substantially exposed during the last decades, by a series of detailed archaeological assessments carried out during the mineral investigation and mining operations, and the development of infrastructure required by these operations. These sources were then supplemented by site visit fieldwork within mining licenses 241 & 263.

Sensitivity and susceptibility rating scales, aimed at establishing the nature of vulnerability and sensitivity of heritage resources that are likely to be impacted by mining activities, were adopted as per assessment objectives. Their vulnerability to the disturbance in the course of mining including drilling was evaluated according to parallel 0-5 scales, abridged in Table 3 below.

Table 3: Rating scales for the assessment of archaeological significance and vulnerability as developed by the QRN.

Significance Rating
0 No heritage significance
1 Disturbed or secondary context, without diagnostic materials
2 Isolated minor finds in undisturbed primary context, with diagnostic materials
3 Archaeological and paleontological site (s) forming part of an identifiable local distribution or group
4 Multi-component site (s), or central site (s) with high research potential
5 Major archaeological or paleontological site (s) containing unique evidence of high regional significance
Vulnerability Rating
0 Not vulnerable
1 No threat posed by current or proposed development activities
2 Low or indirect threat from possible consequences of development (e.g., soil erosion)
3 Probable threat from inadvertent disturbance due to proximity of development
4 High likelihood of partial disturbance or destruction due to the close proximity of development
5 The direct and certain threat of major disturbance or total destruction

Concerning each specific source of impact risk to heritage resources, the assessment methodology estimated the extent of the impact, the magnitude of the impact, and the duration of these impacts. The scales of estimation are set out and explained in Table 4.

Table 4: Assessment criteria for the evaluation of cumulative impacts on archaeological sites developed by the QRN.

CRITERIA	CATEGORY	DESCRIPTION
The 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 5: Reversibility Rating Criteria

Reversibility Ratings	Criteria
Irreversible	The impact will lead to an impact that is permanent.
Reversible	The impact is reversible, within a period of 10 years

4.0 Assumptions and Limitations

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

5.0 Brief Heritage Setting of the Project Area

The proposed mining areas lies within a Karstveld landscape with Colophospermum mopane woodland, although at this more easterly point there are numerous sinkholes and dolines which sometimes have water throughout the year and precipitation sometimes exceeds 550mm per annum.

On the basis of the little that is known archaeologically of the area (Otjozondjupa region in general), there is a likelihood of archaeological remains relating to settlement of Ovaherero in that area in the last few centuries before colonial rule, and of events relating to the anti - colonial war of 1904 (Kinahan 2021). The most enduring archaeological features of Ovaherero settlement are likely to be graves and wells, although many of the latter were taken over and modified by colonial

settler farmers and would no longer be recognizable. Together with the remains of indigenous settlement there are likely to be some historically important relics of early colonial settlement. These might include dwellings and other infrastructure on farms, many of which have formal family grave plots. These remains would all fall under the general protection of the National Heritage Act (27 of 2004).

The region has been the focus of several archaeological surveys although none of these covered the area of interest (ML 241 and 263) itself. In addition, most of these were linear surveys for utility corridors which are generally less productive archaeologically than large area surveys such as of mineral exploration licenses. The proposed mining area is therefore not well known archaeologically although it was the setting for a number of important events during the colonial era that may have left some archaeological indications. The most relevant of these is the Ovaherero anti - colonial uprising that ended in 1904 after a series of battles in the area to the southeast of Otjiwarongo. These include Okanjande (16/1/04), Osondache (17/4/05) and Otjahewita (5/7/04) (Kinahan 2013).

In summary, the archaeology of ML 241 and 263 reviewed here would represent the known human occupation sequence for north-western and north central Namibia as follows:

a. Mid- to upper Pleistocene (ca. 0.128my to 0.040my; OIS 3, 4 & 5a-e): represented by dense surface scatters and rare occupation evidence in sealed stratigraphic context, with occasional associated evidence of food remains.

b. Late Pleistocene to late Holocene (ca. 0.040my to recent; OIS 1 & 2): represented by increasingly dense and highly diverse evidence of settlement, subsistence practices and ritual art, as well as grave sites and other remains. This period also saw the introduction of livestock, metallurgy and crop plants.

c. Historical (the last ca. 250 years): represented by remains of crude buildings, livestock enclosures, wagon routes and watering points as well as abandoned mines and quarries. Historical settlements are often well documented.

5.1 Results of Desktop Research

Information from the NHC shows that the project area falls under the cultural landscape occurring in the Otjozondjupa. The national monuments list has 14 national monuments recorded within Otjozondjupa. The list below shows details of the part of the national monuments occurring in the same region as the project and are recorded in the National Monuments Register.

National Monuments within the Otjozondjupa Region:

Baobab Tree. Largest Baobab tree in pre-independence `commercial farming area'.

2. Grootfontein. Fort built in 1896.

3. Hoba Farm. Largest single meteorite in the world weighing 60 metric tons.

4. Khorab. Memorial to surrender of German troops on 09.07.1915.

5. Okahandja. Grave of Jonker Afrikaner, dating from 1861.

6. Okahandja. Herero Grave Complex - with graves of Tjamuaha, Maharero, Samuel Maharero and Friedrich Maharero. Tjamuaha died in 1861.

7. Okahandja. Rhenish Mission Church and Cemetery. Church consecrated in 1876.

8. Moordkoppie Okahandja. Site of a battle of 23.08.1850 when Jonker Afrikaner's forces killed hundreds of Herero.

9. Okahandja. Grave of Kahimemua Nguvauva. Executed on 11.06.1896.

10. Okaharui. Monument to German soldiers who died on 03.04.1904.

11. Otjihaenamaparero Farm. Dinosaur footprints from over 170 million years ago.

12. Ovikokorero. Monument to German soldiers (26) killed on 13.03.1904.

13. Waterberg Plateau. Area of ecological, geological and historical importance.

14. Grave of Axel W. Eriksson, who died in 1901 and was buried at Farm Urupupa, Grootfontein. The grave was restored in 1974.

NB. The above-mentioned sites do not occur on the area of interest but in the same cultural landscape regionally.

6.0 Fieldwork Findings and Observations

A reconnaissance field survey was carried out to locate and record their most important archaeological features within the footprints of mining licenses 241 and 263 in the Otjozondjupa Region. The field survey was aimed at recording and locating the most important archaeological features (if found) that might be negatively impacted by the proposed mining activities within the boundaries of mining licenses 241 and 263 and close proximity. This survey was also meant to come up with mitigation measures that will safeguard and protect such heritage resources.

The field survey involved a combined approach which included a foot survey and vehicle drive within and around mining licenses 241 & 263 and an interview with some community members who are currently living around the area of interest. The detailed foot survey of the area surrounding the footprints of the two ML located a burial site and remnants of previous mining workers compounds within the boundaries of ML 241. There were archaeological and heritage-significant sites recorded within the boundaries of ML263. The two site locations recorded in ML 241 are set out below together with brief remarks on their significance, the vulnerability of the sites is given in terms of the nature of the mining methods which tend to be mostly destructive. Hence, the identified sites require mitigation measures to be taken to ensure their conservation. The survey team learned that the area of interest has been partially degraded by previous mining activities. The company undertook a comprehensive exploration program in the area after acquiring an environmental clearance certificate for exploration on EPLs 7405 and 7406 from the relevant authority.

Table 6: Findings at the proposed mining site for ML 241

Heritage resources	**Status/findings**	**Level of impact by proposed minings**
Buildings, structures, and places of cultural significance	Previous building/ Ruins	Low
Areas to which oral traditions are attached or which are associated with intangible heritage	None	None
Historical buildings	None	None
Landscapes and natural features of cultural significance	None	None
Archaeological and paleontological sites	None	None
Graves and burial grounds	Burial site	Severe
Movable objects	None	None

1. Detailed field findings

Site 1: Burial site

Site coordinates: 21° 14’ 26’’ S 17° 53’ 00’’

Description: A burial site close to the previous quarry (It is fenced off and its marked).

Significance rating: 3 Archaeological and paleontological site (s) forming part of an identifiable local distribution or group.

Vulnerability rating: 5 The direct and certain threat of major disturbance or total destruction

Records: Photographs and fieldnotes

Reversibility rating: Irreversible

Condition assessment: Sensitive

Figure 5:Burial site located in the vicinity of ML 241 (Source: Author 2024)

Figure 6: Burial site located in the vicinity of ML 241 (Source: Author 2024)

Site 1: Previous building/ Ruins

Site coordinates: 21° 14’ 33’’ S 17° 54’ 06’’

Description: The old building could be previous mining compounds

Significance rating: 2Isolated minor finds in undisturbed primary context, with diagnostic materials.

Vulnerability rating: 3 Probable threats from inadvertent disturbance due to proximity of development.

Records: Photographs and fieldnotes

Reversibility rating: Irreversible

Condition assessment: Poor condition

Figure 7: Previous building ruins in the vicinity of ML 241 (Source: Author 2024).

Figure 8: Previous building ruins in the vicinity of ML 241 (Source: Author 2024).

Table 7: findings at the proposed mining site for ML 263

Heritage resources	**Status/findings**	**Level of impact by proposed minings**
Buildings, structures, and places of cultural significance	None	None
Areas to which oral traditions are attached or which are associated with intangible heritage	None	None
Historical buildings	None	None
Landscapes and natural features of cultural significance	None	None
Archaeological and paleontological sites	None	None
Graves and burial grounds	None	None
Movable objects	None	None

6.2 Field photographs

Figure 9: Receiving landscape of ML 241 (Source: 2024).

Figure 10: Previous mining quarry ML 241 (Source: 2024).

Figure 11: ***Close-up Picture of the Previous Mining quarry (Source: 2024).***

Figure 12:: Previous mining quarry ML 241 (Source: 2024).

Figure 13: Field survey and interview with one of the local farmers and environmentalists in ML 263 (Source: 2024)

7.0 Recommendations and Conclusions

7.1 Management Recommendations

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

7.2 Mitigation measures

Based on the desktop assessment and subsequent field investigation highlighted in this report and with professional confidence and satisfaction, this report recommends approval of a heritage consent by the NHC authority but strictly subject to conditional inclusion of heritage monitoring

measures and Chance Finds Procedure that will be incorporated into the project's Environmental Management Plan (EMP). The field survey on MLs 241 & 263 did not yield any significant archaeological sites. The appropriate impact mitigation measures to be adopted in the course of the project should include:

a) No mining activities should be allowed within a 100 m radius of the burial site recorded in the boundary of ML 263, and should be treated as a no-go area free from mining activities. The proponent should maintain this buffer zone. The burial site should also be fenced off properly because the current fence is not in a good state.

b) The proponent should make use of existing vehicle tracks within the boundaries of the MLs, new vehicle tracks should be avoided by all means.

c) Mining activities should be halted immediately in case of any archaeological materials are unearthed during the phase of mining the discovered site should be demarcated off, and the site's locations must also be incorporated within the project Environment Management Plan and GIS.

d) The footprint impact of the proposed mining activities should be kept to a minimal, to limit the possibility of encountering chance finds within servitude.

e) The Environmental Management Plan is to ensure that all the existing archaeological reference guidelines (Chance Find Procedure Guideline by NHC (2017) are shared with the proponent for guidance. So, any buried archaeological remains that might be discovered during the prospecting phase are handled following the provisions of Part V Section 46 of the National Heritage Act (27 0f 2004).

f) The proponent should show overall commitment and compliance by adopting a zero-damage approach toward any archaeological and heritage resources within and around the boundaries of the MLs.

7.3 Conclusions

The literature review and field survey confirmed that the proposed project area is situated within a larger contemporary cultural landscape dotted with settlements with a long local history and is likely to be of archaeological significance. The field survey established that the project area might have hidden or buried archaeological materials that might be encountered during the mining phase, hence a 'Chance Find Procedure' is highly recommended. This report concludes that the proposed mining activities may be approved by NHC as planned subject to recommendations herein made and the heritage monitoring plan being incorporated in the EMP.

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Appendix 1)

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

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

Areas of proposed development or mining activities are subject to heritage survey and assessment at the planning stage. These surveys are based on surface indications alone, and it is, therefore, possible that sites or items of heritage significance will be found in the course of development work. The procedure set out here covers the reporting and management of such findings.

Scope: The "chance finds" procedure covers the actions to be taken from the discovery of a heritage site or item to its investigation and assessment by a trained archaeologist or other appropriately qualified people.

Compliance: The "chance finds" procedure is intended to ensure compliance with 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 heritage remains reported to the NHC are correctly identified in the field.

A. Responsibilities:

Operator to exercise due caution if archaeological remains are found

Foreman to secure site and advise management timeously

Superintendent to determine safe working boundary and request inspection

Archaeologists to inspect, identify, advise management, and recover remain

B. Procedure:

Action by the person (operator) identifying archaeological or heritage material

- If operating machinery or equipment: **stop work**
- Identify the site with flag tape
- Determine GPS position if possible

- Report findings to the foreman

C. Action by foreman:
- Report findings, site location, and actions are taken by the superintendent
- Cease any works in the immediate vicinity

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

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

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

Appendix 2) Archaeological and Heritage Monitoring Measures

Table 7; Archaeological and Heritage Monitoring Measures

SITE REF	HERITAGE ASPECT	POTENTIAL IMPACT	MITIGATION MEASURES	RESPONSIBLE PARTY	PENALTY	METHOD STATEMENT REQUIRED
Chance Finds (Archaeological and Burial Sites)	The general area where the proposedproject is situated in a historic landscape, which may yield archaeological, and culturalproperty, remains. There arepossibilities of encountering unknown archaeological sites during subsurface construction work which may disturb previously unidentified chance finds.	Possible damage to previously unidentified archaeological and burial sites during the mining phase. • Unanticipated impacts on Archaeological sites where project actions inadvertently uncovered significant archaeological sites. • Loss of historic cultural landscape; • Destruction of burial sites and associated graves • Loss of aesthetic value due to mining work • Loss of sense of place Loss of intangible heritage value due to change in land use	In situations where unpredicted impacts occur mining activities must be stopped and the heritage authority should be notified immediately. Where remedial action is warranted, minimize disruption in mining scheduling while recovering archaeological data. Where necessary, implement emergency measures to mitigate. • Where burial sites are accidentally disturbed during mining, the affected area should be demarcated as a no-go zone ne by use of fencing during mining, and access thereto by the mining team must be denied. • Accidentally discovered breath ls in the development context should be salvaged and rescued to safe sites as may be directed by relevant authorities' authority. The heritage officer responsible should secure relevant heritage and health authorities' permits for possible relocation of affected graves accidentally encountered during mining work.	• Contractor / • Project Manager • Archaeologist • Project Environmental Control Officer (ECO) or Site Manager	Fine and or imprisonment under the NHA	Monitoring measures should be issued as instructed within the project EMP. PM/EO/Archaeologists Monitor mining activities on sites where such mining projects commence within the farm.

Appendix 3) Archaeological Management Plan (AMP)

Objectives of Archaeological Management Plan (AMP)

- Protection of archaeological sites and land considered to be of cultural value.
- Protection of known physical cultural property against vandalism, destruction, and theft; and
- The preservation and appropriate management of new archaeological finds should these be discovered during mining and mining operations.

Table 8; Archaeological Management Plan (AMP

Archaeological Management Plan (AMP)								
Area and Site	**Mitigation Measures**	**Phase**	**Timeframe**	**Responsibility party for implementation**	**Monitoring party**	**Accountable party**	**Monitoring system (performance indicators)**	**Target**
Proposed mining activities on MLs 241 and 263 within the Okahandja District	If potential human remains, NHC and Namibian Police should be contacted	Throughout the project	The project life	Operational staff or any person employed by the proponent	Site Manager (SM)	Proponent	Checklist/Progress report	Place Ordinance 27 of 1966
NB! The procedures to be followed during the operation, decommissioning, and rehabilitation phases are the same as they were during the mining phase.								

AIR QUALITY AND NOISE IMPACT ASSESSMENT REPORT FOR THE DEVELOPMENT OF MANGANESE MINING ACTIVITIES ON MINING LICENSES (ML 241 & 263), OTJOZONDJUPA REGION

By: Ms Ndapandula Shatona (Radiation Physicist)

EXECUTIVE SUMMARY

The proponent, Wepex Resources (Pty) Ltd, applied for a manganese 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 the Otjozondjupa region and Okahandja 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 manganese ore mining. Comparison with international ambient air quality and noise standards was made to determine compliance in terms of potential health impacts.

The Otjozondjupa region has a good air quality, whereas the Okahandja town has a moderate air quality. There are minimal negative environmental impacts on the proposed mining site and its environs with respect to dust deposition resulting from exploration.

Studies finding showed that dust particles are generated in a 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-trolly 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 82-101 dB. Obviously, these values are above the recommended limits of 75 dB (WHO) for daytime industrial area.

Summary of the project mitigation measures on Noise and Air pollution

Impact	**Mitigation Measures**

Noise pollution	• 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.

	• Conducting of noise measurements and monitoring from different prevailing noise levels and recommending appropriate mitigation measures.
Increased air pollution	• 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.

TABLE OF CONTENT

1. INTRODUCTION

The proponent, Wepex Resources (Pty) Ltd, applied for a manganese ore mining licence with the Ministry of Mines and Energy. The proposed mining area is located about 160 kilometers northeast of the town of Okahandja within the Otjozondjupa Region.

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 longterm 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 about 160 kilometers northeast of the town of Okahandja within the Otjozondjupa Region.

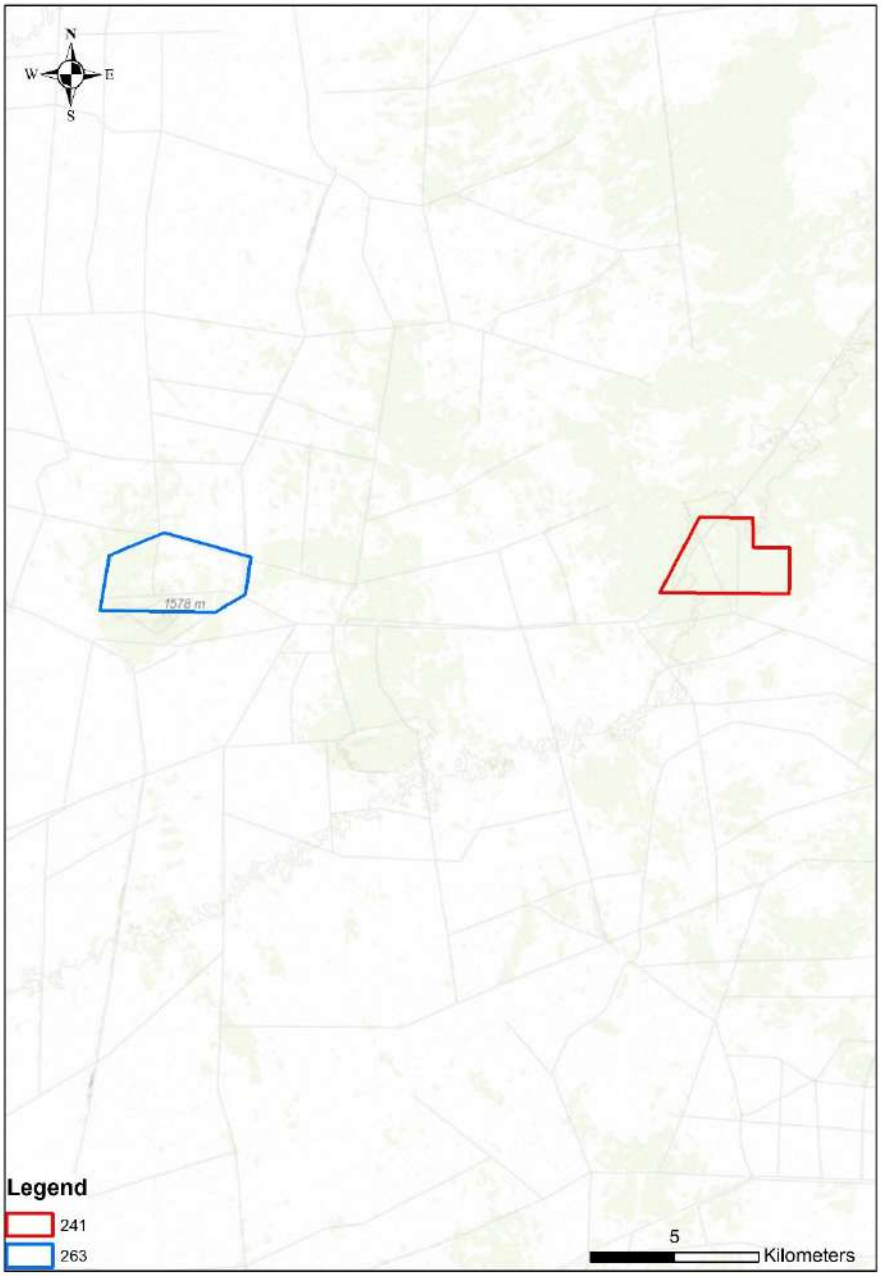
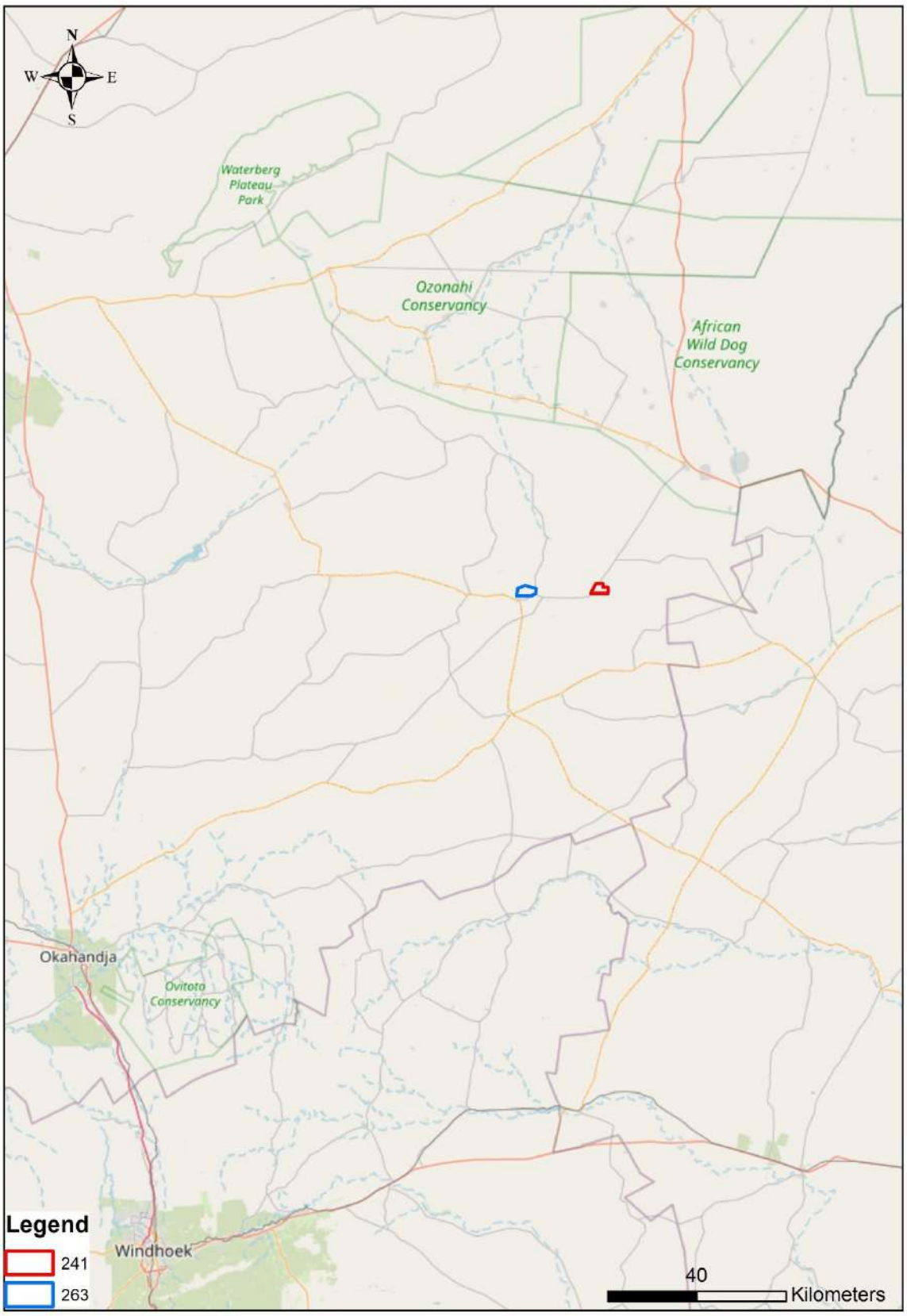


Figure 1. Proposed mining boundary.

The proposed project will primarily mine manganese through open pit mining. Open pit mining is the most widely used technique to extract manganese 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


N
W
E
S
Waterberg Plateau Park
Ozonahi Conservancy
African Wild Dog Conservancy
Okahandja
Ovitoto Conservancy
Windhoek
Legend
241
263
40
Kilometers

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 DESKTOP REVIEWING OF RELEVANT LITERATURES,

Various literatures were used in aiding the successful completion of the report and meteogram report of Okahandja 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 manganese, 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 bellow 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-trolly 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	-	-

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	**Night**
	07:00 - 22:00	**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 are 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))					
Type of district	Outdoors			Indoors, with open windows		
	Day-night LR,dn1)	Day-time LReq,d2)	Nighttime LReq,n2)	Day-night LR,dn1)	Day-time LReq,d2)	Night-time LReq,n2)
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 Pm_{10} (US-EPA, 2000).

Averaging period ($\mu g/m^3$)	South African SANS 1929:2005 ($\mu g/m^3$)	WHO ($\mu g/m^3$)	US-EPA ($\mu g/m^3$)	European Union ($\mu g/m^3$)
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/m³)	Frequency of Exceedance
PM 2.5	24 hours	25	4
	1 Year	15	0
PM10	24 hours	75	4
	1 year	40	4

PM_{10} 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 Okahandja area which is close to the mining license area have fine particle matter levels ($PM_{2.5}$) ranging from 13-34 µg/m³ and particle matter (PM_{10}) is about 9 µg/m³.

Table 8: Meteogram report for Okahandja Town, OTJOZONDJUPA 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 ^{O}C	20^{O}C	19^{O}C	32^{O}C	37^{O}C	36^{O}C
PM2.5 ($\mu g/m^3$)	13.35	14.5	22.5	31.3	34.8

Quantification of total suspended PM (TSP) and PM_{10} emissions, i.e., dust emission factors for various activities of manganese 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 PM_{10} 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 manganese mine, be given in Table 9 below.

Table 9: Dust Emission Factors for Various Operations at Mines

Operation/Activity	Units	Emission Factor	
		TSP	PM10
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 commerce. 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), Otjozondjupa region has a good air quality of 6 $\mu g/m^3$ $PM_{2.5}$ and 10 $\mu g/m^3$ PM_{10}. Whereas the Okahandja town has a moderate a quality with 13-34 $\mu g/m^3$ $PM_{2.5.}$ 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 manganese 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 biding chemical or sprayed with recycles water and compacted
Primary and Secondary crushing and floatation	sprayed with water
Stock piles	Should be covered with dust biding 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.

- 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 **Okahandja 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	**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

	activities. E.g. Okahandja town	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 office
		Compliance inspection implementation of air pollution control measures		Daily		
	Operation Phase	Emission monitoring (PM, SO2, 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	Semiannually		

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.

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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Biodiversity Impact Assessment the Proposed Manganese Mine, ML 241 & 263 Area

October 2024

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1. ML BIODIVERSITY IMPACT ASSESSMENT

1.1. Methods and approach

1.1.1. Impact assessment method

Slootweg and Koolhof 2003 defined three essential questions that must 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 241 & 263 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
		management actions have been taken into considerations and there remain impacts that cannot be managed. Offsets require careful planning, assessing and management to be effective.

		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.

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	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.**

1.2. Project description

The project description documentation provided in May 2023 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 241 & 263 Manganese 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 because 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, DECOMISSIONING						
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	□ Removal or killing of individual organisms during earth-moving activities and traffic affects: o Plants, particularly trees, some of them protected o Satellite fauna and flora of above-mentioned trees o Animals, especially reptiles and invertebrates, as a result of being struck by vehicles and machinery moving earth or using roads o Dormant organisms, such as frogs, outside their season of activity o Seeds and eggs, and their loss prevents establishment of the next generation o 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

Management of impact	• 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
IMPACT 1.	**Direct destruction of organisms and their habitats**

Monitoring	• 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

Additional recommendations and notes	• A permit is required for the removal or destruction of protected plant species (there are 13 such species).

IMPACT 2. Direct loss of biodiversity due to poaching, other killing of animals and harvesting of plants	
STAGE: CONSTRUCTION, OPERATIONAL, DECOMMISSIONING	
SOURCE OF RISK: Unusually high density of people gathered in area which previously had a low density of people	
Nature of impact	• 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 *Combretum imberbe* (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	• 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.
IMPACT 2.	**Direct loss of biodiversity due to poaching, other killing of animals and harvesting of plants**
	• 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	□ Monitor staff for possession of animal or plant parts

Additional recommendations and notes	• 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, DECOMISSIONING	
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	• 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	• 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	• Record and report all incidents					
Additional recommendations and notes						

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, DECOMISSIONING	
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	• 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 irrigation 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

<table>
<tr><td></td><td colspan="6">• 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 (Anopheles) may breed in water pools and transmit malaria, although this is a moderately low risk at ML 241 & 263</td></tr>
<tr><td>Status</td><td colspan="6">NEGATIVE, POTENTIALLY CUMULATIVE</td></tr>
<tr><td>Level of impact</td><td colspan="6">Individuals and Populations</td></tr>
<tr><td>Mitigation</td><td>Severity</td><td>Duration</td><td>Spatial Scale</td><td>Consequence</td><td>Probability of Occurrence</td><td>Significance</td></tr>
<tr><td>Unmitigated</td><td>M</td><td>L</td><td>M</td><td>M</td><td>M</td><td>M</td></tr>
<tr><td>Mitigated</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td>Management of impact</td><td colspan="6">• 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.</td></tr>
</table>

IMPACT 4. **Direct and indirect effects on biodiversity due to the presence of humans, dust, noise, light, moisture, vibrations, artificial surface water**	
	• 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	• Monitor levels of dust, noise, light and humidity

Additional recommendations and notes	• 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

IMPACT 5. Direct and indirect effects of chemical pollution, waste oil, rubbish, faeces	
STAGE: OPERATIONAL	
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; wastewater management facilities; illicit placement of faeces in the field	
Nature of impact	• 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

<table>
<tr><td></td><td colspan="6">• 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 241 & 263, surface contaminants, including contaminated water and sewerage can quickly infiltrates into the ground and may reach the groundwater; 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.</td></tr>
<tr><td>Status</td><td colspan="6">NEGATIVE</td></tr>
<tr><td>Level of impact</td><td colspan="6">Habitats, populations, individuals</td></tr>
<tr><td>Mitigation</td><td>Severity</td><td>Duration</td><td>Spatial Scale</td><td>Consequence</td><td>Probability of Occurrence</td><td>Significance</td></tr>
<tr><td>Unmitigated</td><td>H</td><td>H</td><td>M</td><td>H</td><td>M</td><td>H</td></tr>
<tr><td>Mitigated</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td><td>L</td></tr>
<tr><td>Management</td><td colspan="6">• 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.</td></tr>
</table>

	• 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**
	• 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 is 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	• 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	• 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	• 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	• 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	• 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, DECOMISSIONING

SOURCE OF RISK: Location of infrastructure and disturbance due to mining activities and use of roads						
Nature of impact	• 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	• 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	• 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**

	mining activities affect the movements and local population of cheetahs • Monitor the occurrence and spread of invasive species so as to instigate steps for their control, following expert advice
Additional recommendations and notes	• 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

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	• 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: • Power lines: waterfowl, geese, waders, owls, korhaans, Kori Bustard, (if this is in a flamingos flight path, then they are susceptible) o Stay wires: Ostrich, korhaans, sandgrouse • Bird species likely to be electrocuted: • Power lines: eagles, vultures, crows, vultures, Helmeted Guineafowl o 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
Management of impact	• 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 o Use a minimum of stay wires necessary, and mark them with white and red spiral vibration dampers o Clearance distance between adjacent electrical points should be further than the largest birds' wingspans or tip of toe to tip of beak distance o Earth wires should have sufficient safety gaps to avoid being permanently active (though still effective as lighting conductors) o 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 Span Lite self-illuminating warning spheres or solar powered LED lights and)					
Monitoring	□ Regularly patrol all project power facilities once a month and more frequently if problems are detected					
IMPACT 8.	**Direct impacts on birds due to collision with and electrocution by on-site electrical structures**					

	• 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
Additional recommendations and notes	• 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 241 & 263 Manganese 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 241 & 263 Manganese Mine Project should take on a good share of collective responsibility for this feature.

Table 3. Summary of impact significance of the ML 241 & 263 Manganese 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

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 o Avoid where practical removal of large trees, particularly the protected species o 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 o Manage traffic to be safe for animals and humans at all times o Provide adequate training for drivers o As much as possible, avoid driving to and from the mine at night o 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.

GROUNDWATER IMPACT ASSESSMENT AND ITS POTENTIAL VULNERABILITY TO PROPOSED MINING ACTIVITIES AT WEPEX MANGANESE PROJECT (EPL7405 and EPL7406)

IMPACT ASSESSMENT REPORT

15 OCTOBER 2024

Compiled by

Dr Josefina T Hamutoko and Dr. Innocent Muchingami

(Hydrogeologists)

Document Reference No: EH 001/24

Declaration

This report titled “GROUNDWATER IMPACT ASSESSMENT AND ITS POTENTIAL VULNERABILITY TO PROPOSED MINING ACTIVITIES AT WEPEX MANGANESE PROJECT (EPL7405 and EPL7406)” for the client as follows:

The site was audited, and this Impact Assessment report prepared by (primary author);

NAME	**DESIGNATION**	**SIGNATURE**
Dr Josefina T. Hamutoko	Lead Consultant	

For and on behalf of:

Proponent:

Wepex Mining Resources (Pty) Ltd

Name:
_____

Signed:_____ **Date:** _____

Executive summary

The consultants were contracted to undertake a hydrogeological appraisal, as part of the Environmental Impact Assessment on the WEPEX Manganese Project, comprised of EPL7405 and 7405, which is situated about 163 kilometres northeast of the town of Okahandja within the Otjozondjupa Region of Namibia. The preliminary assessment has classified the study area to be characterised by groundwater resources with low yields and groundwater of poor quality. A further ascertainment of the state of groundwater resources successfully as detailed in the following sections.

The assessment was carried out through reviews of available baseline data, geophysical survey reports and the exploration reports for the EPL 7405 and EPL7406 as well as a field reconnaissance visit made on the 5 - 6th of October 2024. An integrated approach of the geological structures and geophysical interpretation of the existing high-resolution aeromagnetic data sets with aim of delineating structures and contacts and assess the potential effects in terms of groundwater availability and potential contamination.

In general, EPLs are located in a arid region area with limited a groundwater potential that controlled existence of secondary fractures and geological contacts. There are however a few boreholes and groundwater abstractions points within the host farm believed to be tapping from the crystalline basement system. The water quality index associated with the typical geological formation in the project area is classified as group D according to the Namibian drinking water standards, meaning it is unsuitable for abstraction in large quantities for human consumption because of high fluoride content (3.4mg/l).

In conclusion, the presence of solid geological formation across both EPLs coupled with the absence of aquifer systems therefore suggest being no little impact and suggests no direct contamination of groundwater resources from the proposed mining activities. There may be however a small chance of potential Manganese and Iron contamination from the isolated future heavy rainfall events and there may be need to establish groundwater monitoring boreholes at each site .

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1 Introduction

Through a circular comprising of an official letter of engagement from the owners and management of WEPEX Manganese Project. The consultant, represented by Dr J Hamutoko and Dr I Muchingami undertook to carry out a detailed investigation potential impact of the proposed mining activities on any existing water resources. The current report is also being prepared under the context that the proposed project area lies entirely on one of the groundwater dependant basins with no existing surface water bodies within the vicinity of the area. As such the contents of the report will sorely focus on assessment on groundwater resources. The work contained in this report is in fulfilment of the following objectives:

- To provide a baseline information on the groundwater resources within the EPL7405 and EPL7406.
- To describe, evaluate, and analyse the foreseeable potential environmental effects on the water resources resulting from the proposed project activities which is classified as direct, indirect, cumulative, irreversible, short-term and long-term effects.

1.1 Project locality

The water resource (groundwater) impact assessment detailed in this report is centered on the proposed WEPEX Manganese Project that exist under EPL 7406, which is situated in Otjozondjupa Region, within the Otjosondu Manganese Field. in central- eastern Namibia within the Okahandja District. It is approximately 142 km northeast of Okahandja and about 33 km north-northeast of Hochfeld (Figure 1). The EPL covers an irregularly shaped area defined by eight (8) corner coordinates, encompassing a total of 826.5421 hectares (Figure 1 a and b).


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-13.291667° -13.7° -14.75° -15.8° -16.85° -17.9° -18.95° -20° -21.05° -22.1° -23.15° -24.2° -25.25° -26.3° -27.35° -28.4° -29.45° -30.5° -31.55°
N
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Mongu
Rundu
Etosha National Park
Chobe National Park
NAMIBIA
Windhoek
Central Kalahari Game Reserve
BOTSWANA
NAMIB DESERT
KALAHARI DESERT
Namib Naukluft Park
Kgalagadi Transfrontier Park
Gaborone
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Bloemfontein
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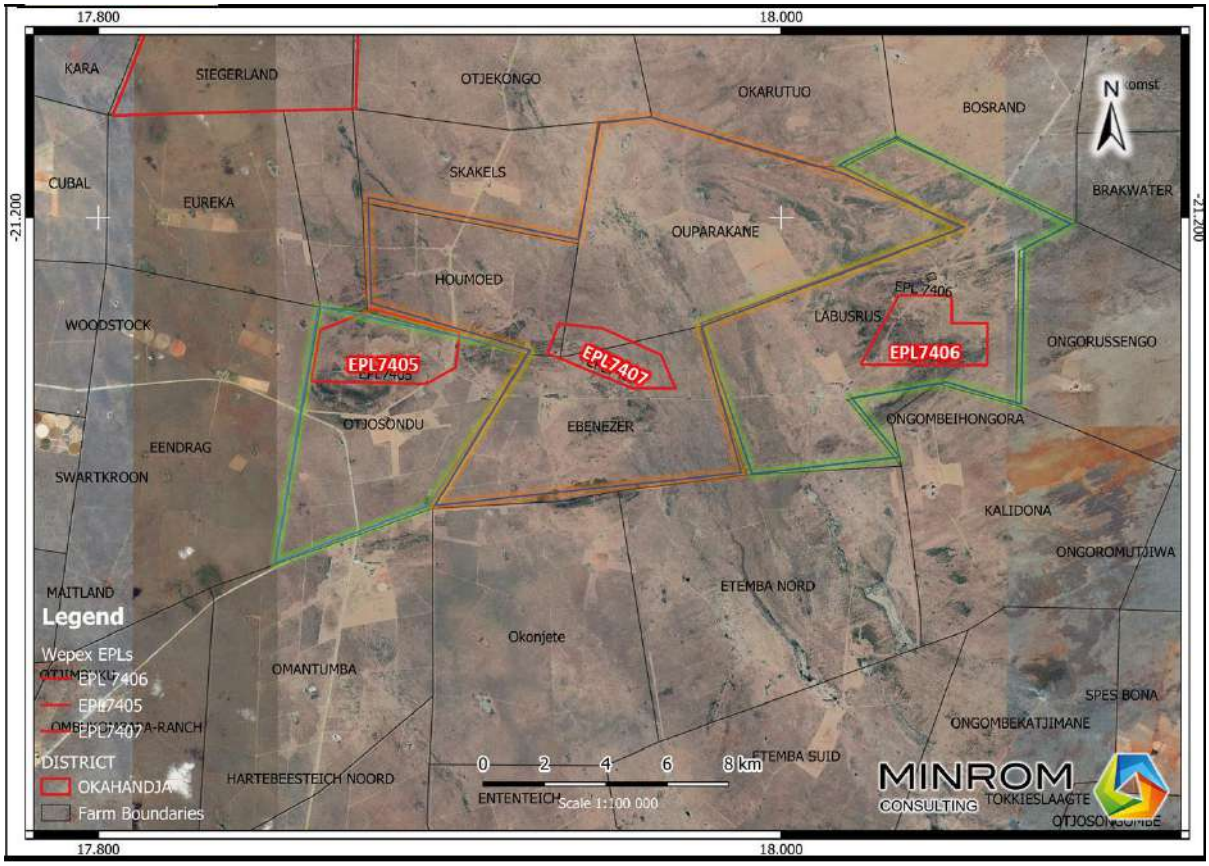
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LABUSRUS
ONGORUSSENGO
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EBENEZER
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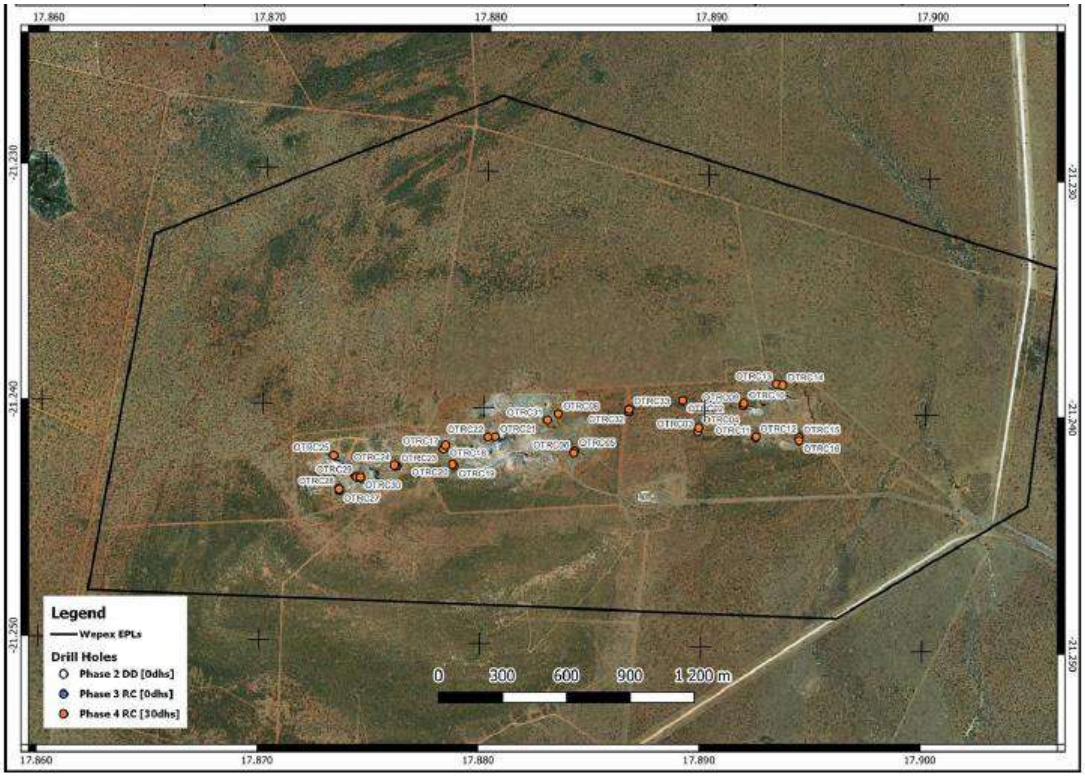
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Wepex EPLs
Drill Holes
Phase 2 DD [0dhs]
Phase 3 RC [0dhs]
Phase 4 RC [30dhs]
0 300 600 900 1,200 m

(c)

Figure 1: Project area map showing (a) the locality within Namibia, (b) the locality of EPL7405 and EPL7406 (c) the zoomed in google earth image of EPL 7406 and (d) the zoomed in google earth image of EPL 7406. (Source technical reports on the feasibility study.

1.2 Topography and Elevation Vegetation

The project area characterized by a flat terrain, with regional altitude reported to range from 1600 to 1800 meters above sea level. The local vegetation is typical of savannah environments, with a mix of broad-leaf and thorny deciduous trees and shrubs distributed throughout the area. Hydrologically, the dry thorny bushes are indicative of a hydrogeological medium with a poor soil retention capacity and the potential presence of a solid rock cap that prevents access to the permanent groundwater table at deeper depth. As such the vegetative features suggest that there is minimal hydrological effects of the mining activities on the already deep depth to water table (Figure 2).

Figure 2: Contrasting photographic images taken on the 6th of October 2024 showing (a) the dry thorny bushes at the project area and (b) green and huge acacia trees which are often associated with shallow groundwater table at a site 30km from the proposed project area. The acacia trees from (b) are tapping from the groundwater table and in (a) where the EPL7046 is located, the groundwater table seems to be deep and the geologic medium is characterised by a solid hard crystalline rock as evidence by the in-situ rock on the photograph.

1.3 Climate

The understanding of climatic conditions of the area are critical in assessing the hydrological conditions within the project focus. As Namibia is generally considered to be an arid country, with a semi-desert on its eastern edge (Kalahari) and a desert on its western edge (Namib desert), the EPL is situated in a typical transiting zone of the dry savanna and arid Kalahari Desert with a yearly average rainfall between 350-400 mm/a. Most of the precipitation, of which around approximately 50% is lost to evaporation, approximately with the only on average annual groundwater recharge being estimated to be 5-20% of the precipitation as reported in previous reports.

2 Hydrogeological assessment and implication to the water resources

2.1 Introduction

As alluded to in the previous section, the proposed project area lies within a solely groundwater dependant basin with no visible surface water resources within the EPL (Figure 3). In this regard the assessment of potential impact of the proposed mining activities were sorely based on groundwater resource potential and its vulnerability to contamination. The approaches undertaken for this include an analysis of the existing geological information and the analysis previous results of the Geophysical studies that were carried out during the exploration stage of the entity.

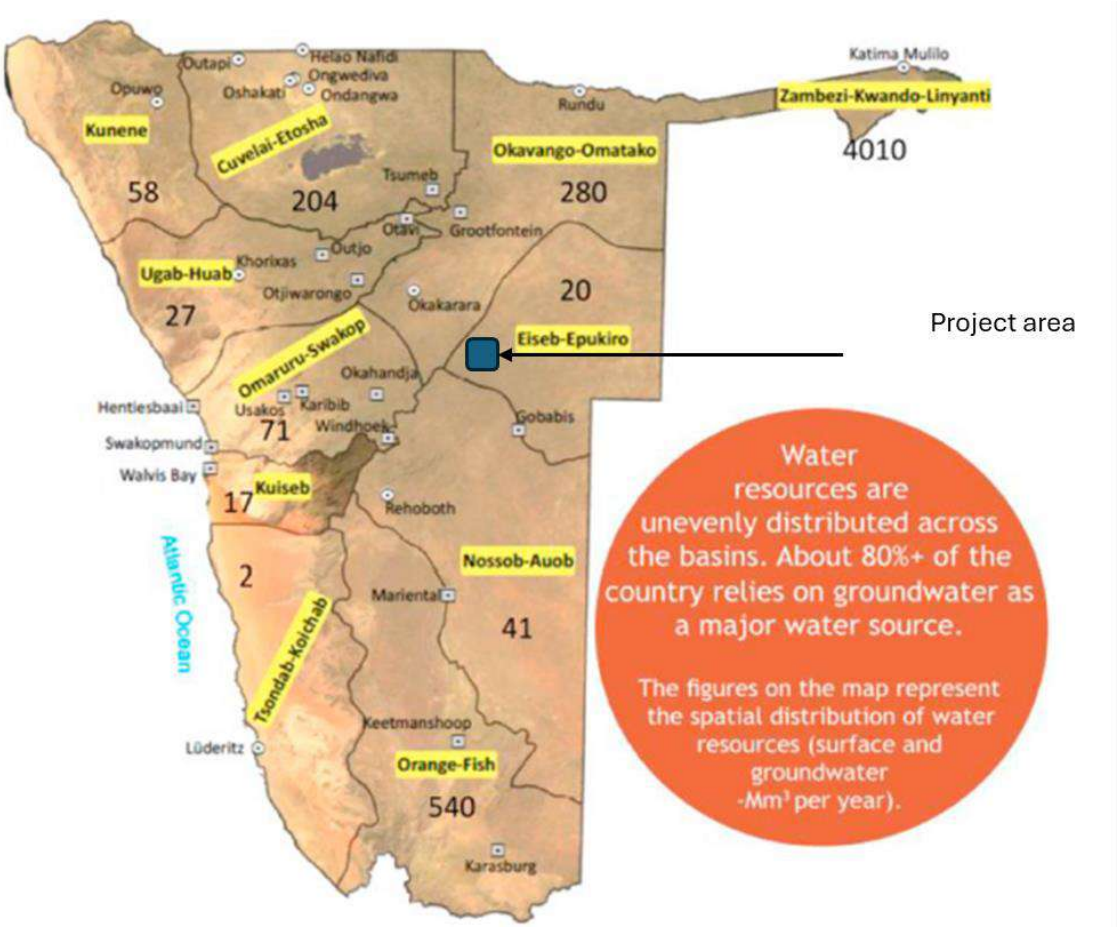


Figure 3: Water Potential of Namibia's Water Basins (IWRM, 2010)

2.2 Assessment of the Geological implication on water resource impact

2.2.1 Regional hydrogeology

The regional geology associated with the project area (both EPL 7405 and 7406) is influenced by the Damara Orogeny. This orogeny relates to a time when continental convergence, collision and divergence resulted in sedimentary assemblages being deposited, metamorphosed, structurally deformed, and eroded to the formations currently observed. Both EPL 7405 and 7406 are situated along the Pan African intracontinental (Damara Belt) branch of the Damara Orogen, a key component of the Pan-African orogenic mobile belts that contributed to the formation of the Gondwana Supercontinent. The Damara Belt evolved through successive stages of the breakup of the supercontinent Rodinia: 1) spreading, 2) drifting, and 3) subduction and convergence. The Naauwpoort Formation, which contains rhyolitic volcanic rocks, forms part of the Nosib Group which characterises the study area. Additionally, the Damara Orogen is associated with the presence of metamorphosed, structurally deformed crystalline like rocks which are responsible for the existence of low yielding crystalline aquifers whose groundwater occurrence follows the study presented in Chilton and Foster, 1955. As such, hydrogeologically, the project area is characterised by very low groundwater potential due to the presence of crystalline aquifer systems (Figure 4). As such the proposed mining activity will have very minimal impact on the regional groundwater system.

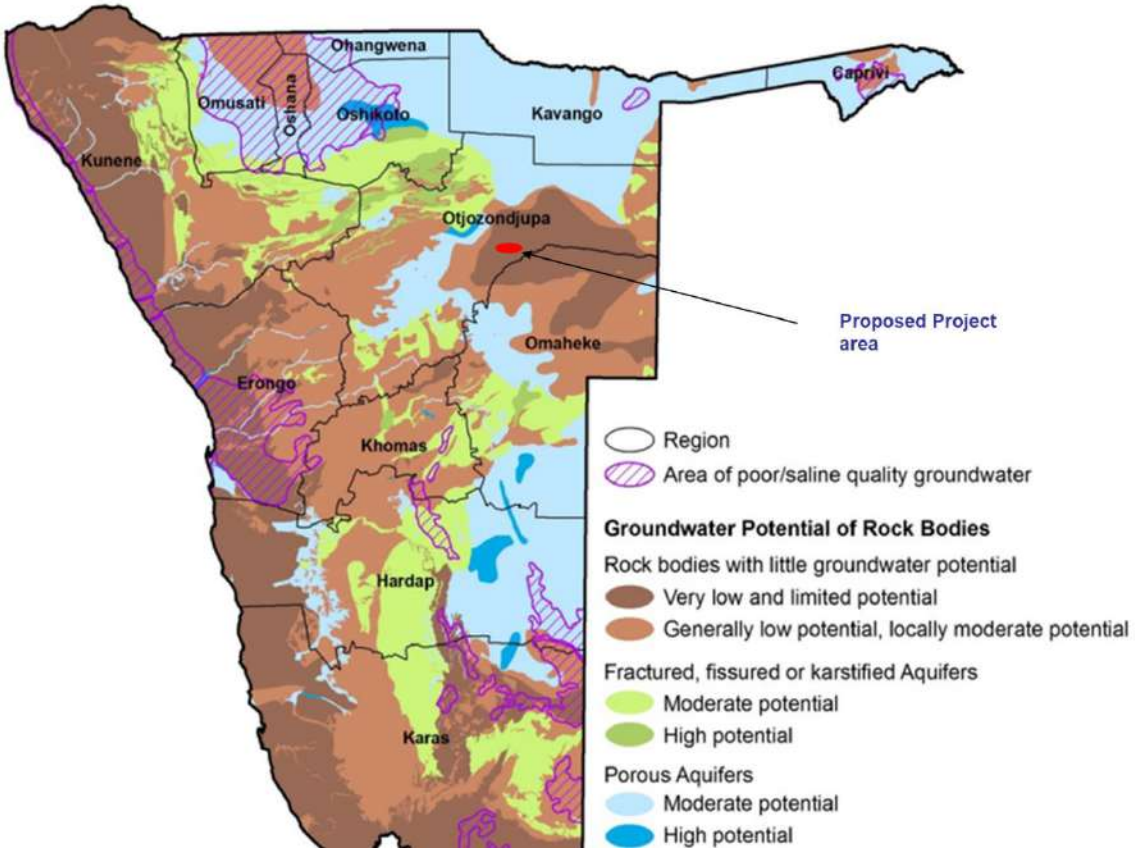


Figure 4: The hydrogeological map of Namibia showing that the proposed project area is situated in an area associated with 'very low and limited groundwater potential'. As such the proposed mining activities will have limited impact on the water resources within the study area.

2.2.2 Local hydrogeology for EPL 7405 and EPL7406

The local hydrogeology confirms the crystalline basement natures of the potential groundwater system that is mainly influenced by the local geology of the area (composed of pre-Damara basement rocks, comprising granulitic gneisses and schists of the Abbabis Metamorphic Complex, exposed along the northwest and southwestern parts of EPL 7406). These basement rocks are overlain by metasedimentary rocks of the Damara Supergroup (Swakop Group). The Swakop Group is divided into lower and upper quartzite units, separated by the Chuos Formation, which hosts the manganese mineralization. The rocks have undergone several phases of deformation and have been metamorphosed to upper amphibolite facies grade (Figure 5-7), altering the original paragenesis to a silica-rich metamorphic manganese mineral assemblage. Additionally, pegmatitic veins have intruded the ores (Katz, 1978; Bühn et al., 1990).

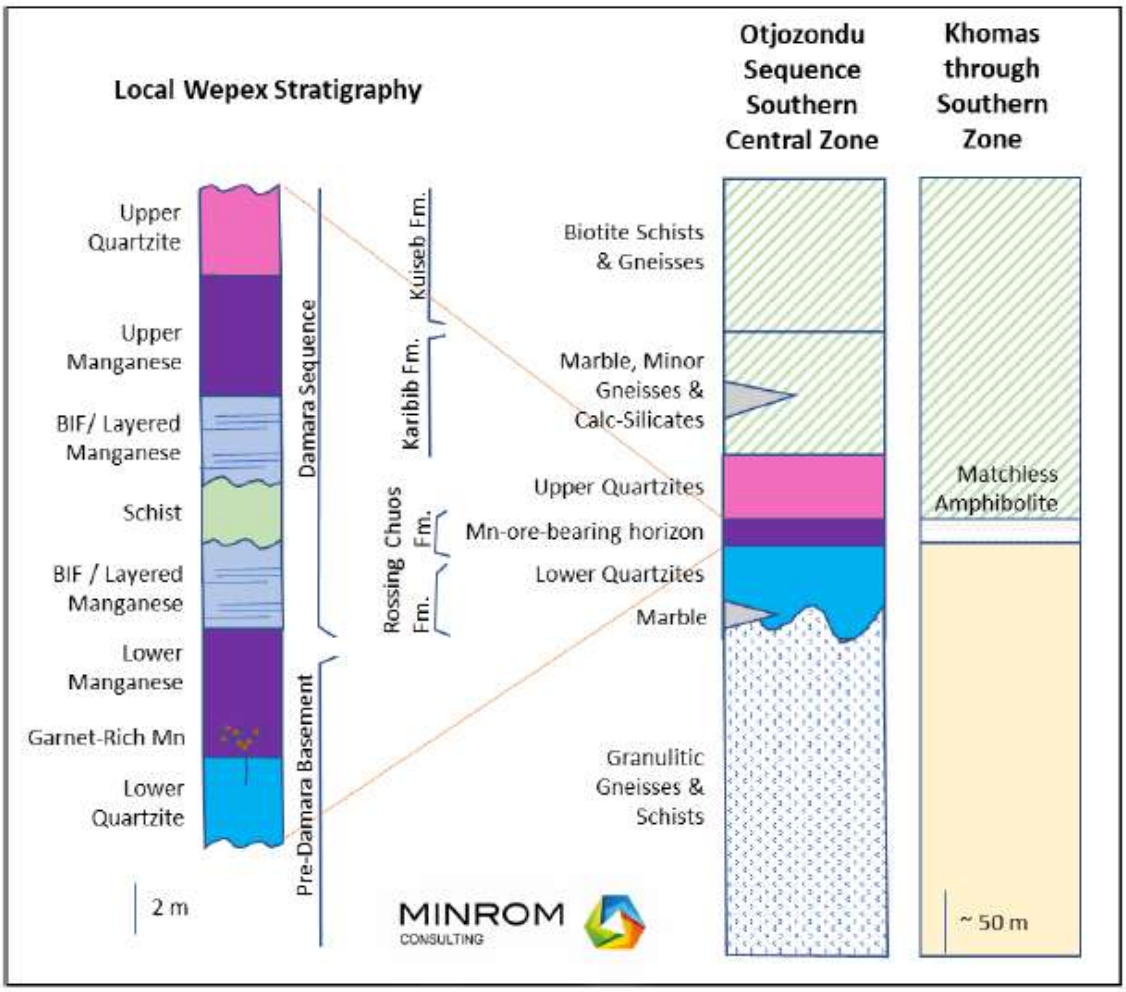
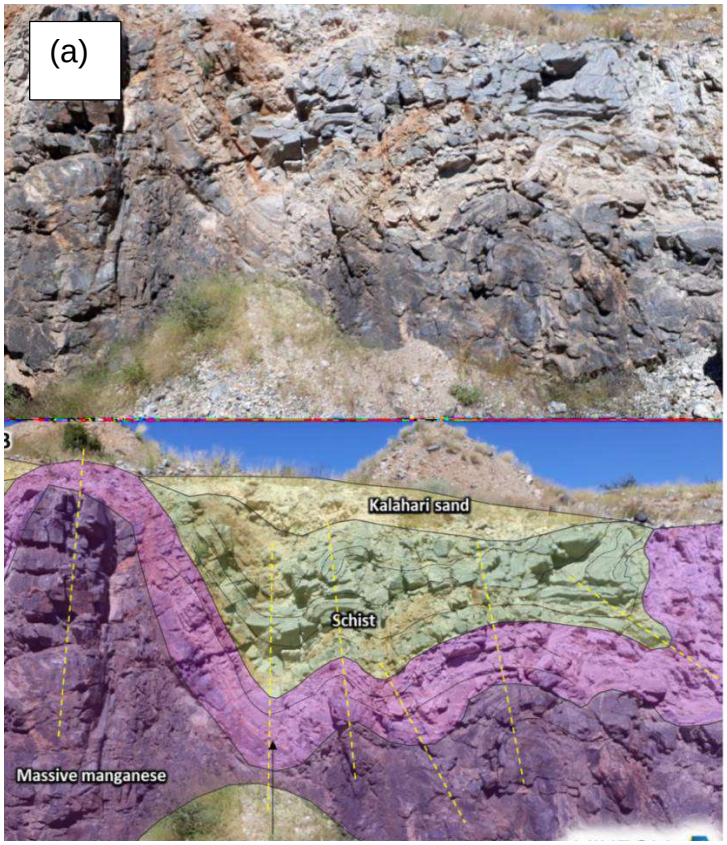


Figure 5: The lithostratigraphy constructed from drilled core at EPL 7405 confirming that the project area is made of solid hard rock formation that is impervious and often associated with a low groundwater storage . As such the medium will less likely host sigsignificant groundwater quantities and the proposed mining activities are less likely to affect the groundwater resources in the study area.

Figure 6: A further confirmation of the crystalline environment dominated by hard rock geology around the EPL7405 project area.



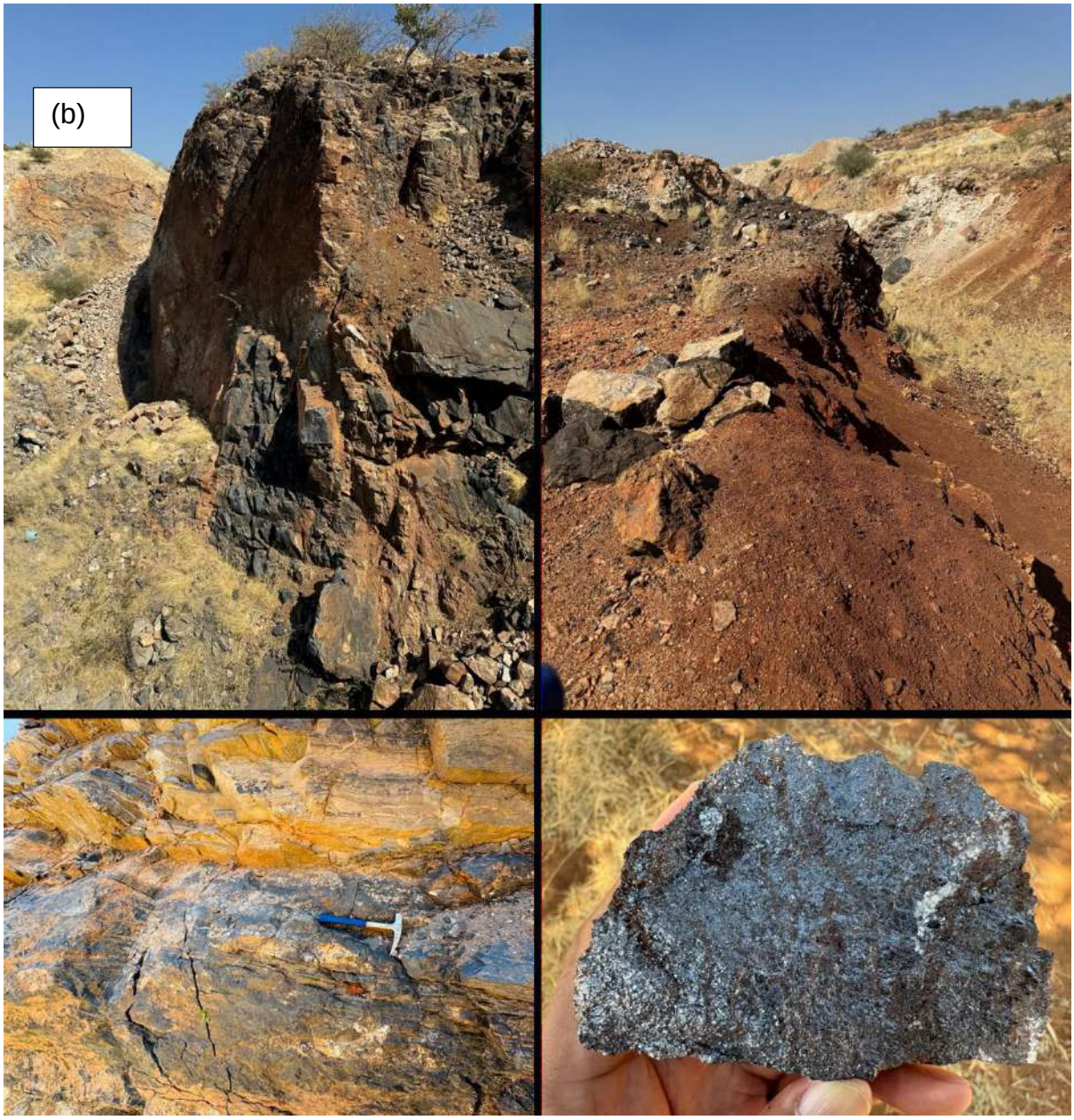


Figure 7: Local geology around the EPL7406 confirming the crystalline basement nature of the groundwater system around the study area with a limited degree of fracturing and weathered regolith. This therefore suggest that the local geology additionally acts as a solid cap to prevent any potential contamination of groundwater resources within the study area.

Groundwater potential associated with this crystalline basement formations explained in Figure 7 (b) suggests that the country rock (Hanging wall) extends over wider coverage for EPL 7406, suggesting that the groundwater resources and deep enough and will likely not be impacted by the proposed mining activities as had been suggested for EPL7405. The main lithological units mapped around both EPLs include the Kalahari cover, quartzite, schist and mica-schist which are all metamorphosed

units and crystalline in nature with groundwater occurrence and flow being controlled by the fracture network that is generally poorly manifested in the project area. The drilling results confirmed that the basement rocks in EPL7405 are overlain by metasedimentary rocks of the Damara Supergroup (Swakop Group), that are underlain by the impermeable granitic and gneiss formations which cover the entire EPL area. The manganese ore is associated with banded iron formation (BIF) layers, primarily composed of hematite intermixed with manganese and iron-rich gneisses (Bühn, 1991).The manganese and iron oxides present a low level of water contamination of shallow groundwater systems which are however likely not present in the study area.

(a)

(b)

Figure 8: The Hardrock sequence further observed in localities of EPL 7405 suggesting the crystalline basement nature of the aquifer systems that would likely exist in the study area. The brownish colour represents the oxidation from the banded iron formation which forms part of the mineralisation and could hance a chance of shallow water resource contamination. However the hard rock medium suggests a less likely occurrence of a shallow aquifer system.

2.3 Hydrogeophysical interpretation of the aeromagnetic data set

Aeromagnetic could be considered at a tight prospect scale in order to provide local hydrogeological mapping and is useful in the interpretation of the extend of the country rock that is characterising the hard rock formation and overlain by a thin Kalahari sand formation. Total Magnetic Intensity (TMI) grid was generated for the project areas and then processed using Geosoft's Oasis Montaj software to apply the reduced to pole and first vertical derivative and analytical signal filters by the previous consultants within the WEPEX Manganese project operations. Reduced to Pole modifies an observed magnetic anomaly to represent what would be detected if both the magnetization and the ambient magnetic field were oriented vertically, the induced magnetic field for an isolated source will produce an anomaly with its peak positioned directly above the magnetic body. The first vertical derivative filter enhances anomalies from shallow sources while suppressing those from deeper sources, improving the resolution of the central position and the nearest edge of magnetic bodies (Blakely, 1995). The aeromagnetic maps are presented in Figures 9 and 10 for EPL7405 and 7406 respectively. This filter is good for highlighting structural features

and revealing the magnetic textures of different geological units which are likely to control groundwater occurrence within the crystalline rock formation.

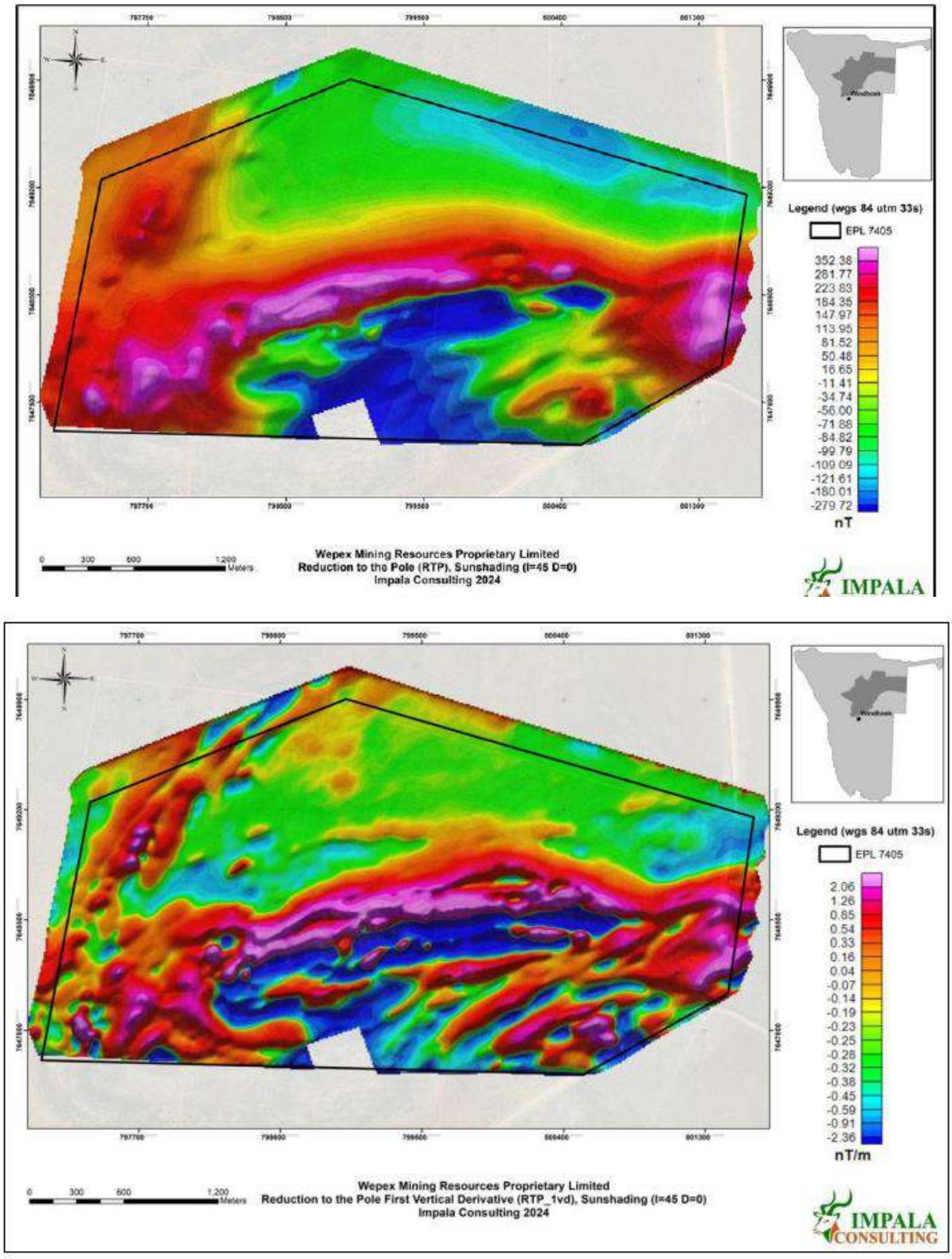
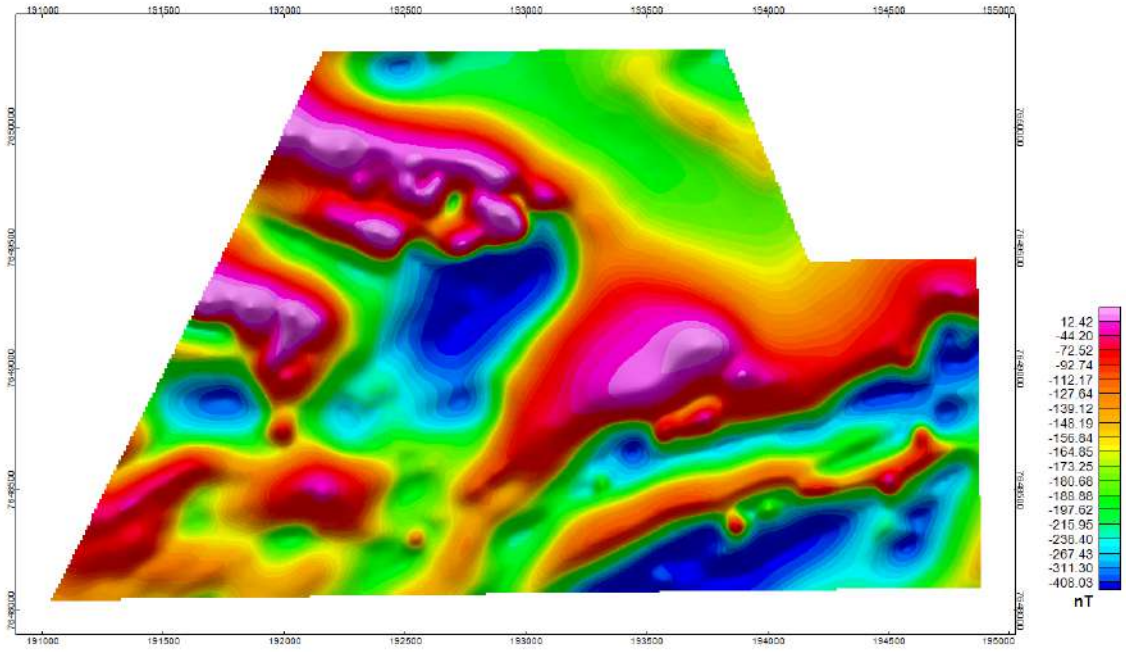
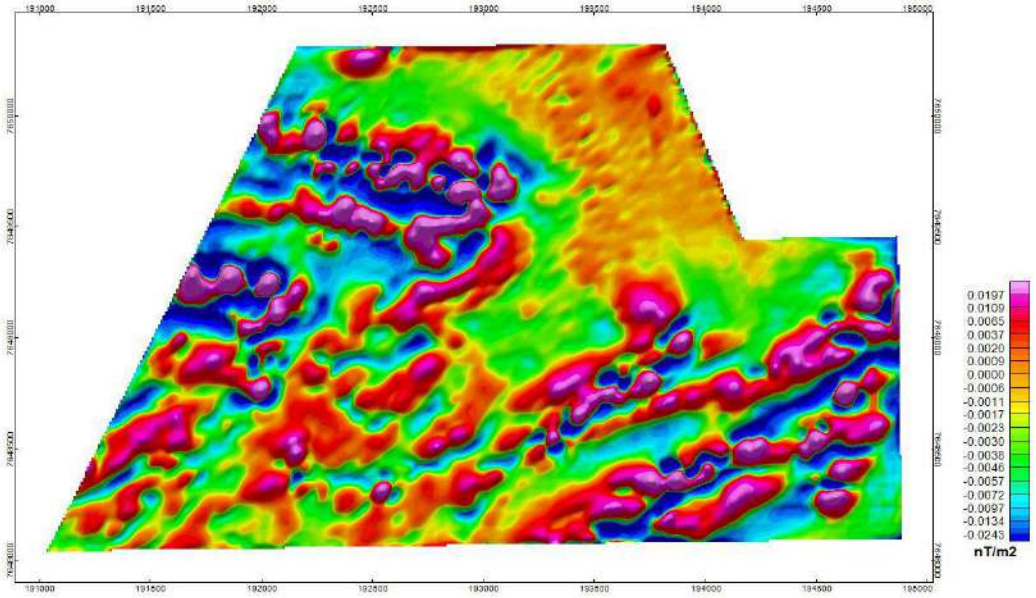


Figure 9: Processed Aeromagnetic results showing (a) Reduced to pole map and (b) First vertical derivative map for EPL 7405 used in the hydrogeophysical interpretation.


191000
191500
192000
192500
193000
193500
194000
194500
195000
12.42
-44.20
-72.52
-92.74
-112.17
-127.64
-139.12
-148.19
-156.84
-164.86
-173.25
-180.66
-188.88
-197.62
-215.95
-236.40
-267.43
-311.30
-408.03
nT

(a)


0.0197
0.0109
0.0065
0.0037
0.0020
0.0009
0.0000
-0.0006
-0.0011
-0.0017
-0.0023
-0.0030
-0.0038
-0.0046
-0.0057
-0.0072
-0.0097
-0.0134
-0.0243
nT/m2

(b)

(c)

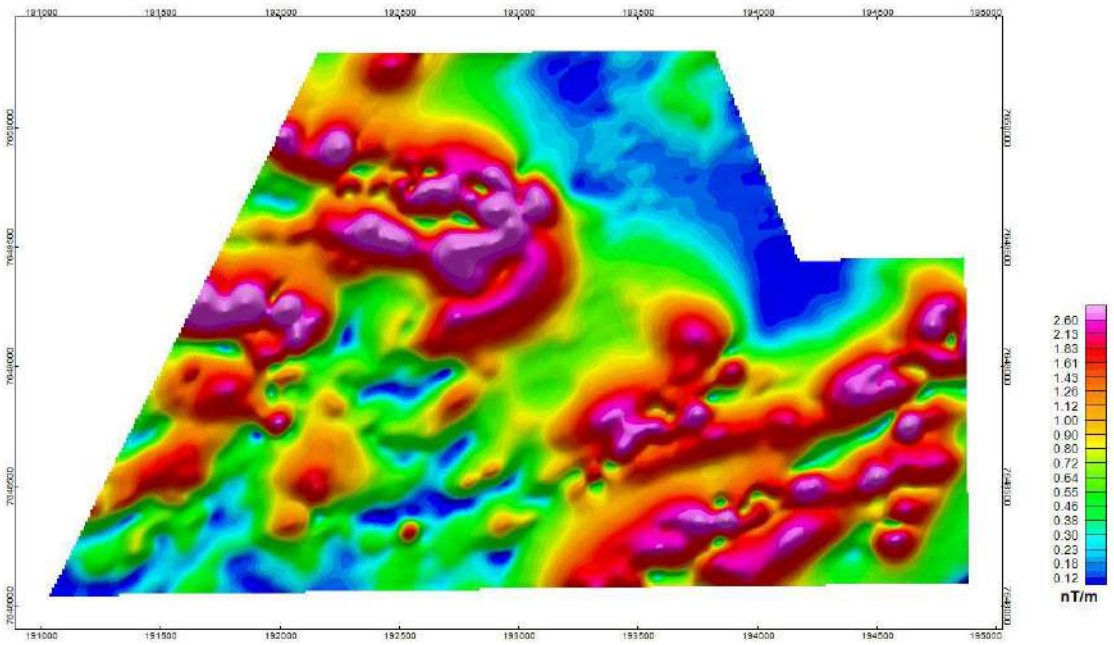


Figure 10: Processed Aeromagnetic results showing (a) Reduced to pole map and (b) First vertical derivative map and (c) analytical signal map for EPL 7406 used in the hydrogeophysical interpretation.

The Magnetic maps are interpreted in terms of the potential presence of structures likely to control groundwater availability within the project area. Volcanic rocks with a low groundwater potential are usually associated with high magnetic susceptibility values.The geophysical interpretation (figure 3) suggests an alternating layers of arkosic quartzite, schist, gneiss and magnetic quartzite separated by thin marble band is likely extending over the entire coverage off the two EPLs. Both the reduced to pole and analytic signal maps show a wider extent of high magnetic susceptibility formations which are suggestive of a presence of a solid bedrock within the project area that is likely impermeable and having a low groundwater potential. In as much as there are a few magnetic contrasts in the fist vertical derivative and the other magnetic maps, these are interpreted and representing different contacts between the volcanic and metamorphic rock sequences which are both crystalline in nature and form a relatively poor aquifer formation. In as such these results further suggest a minimal impact on groundwater resources from the proposed mining activity.

2.4 Water quality and Possible impacts of mining activities on groundwater

As stated in the introduction of the report, there are no visible surface water bodies in the project area and unless in the case that there are heavy rainfall events there is no envisaged immediate threats effects of the proposed mining activity. In addition, the rock exposures presented in the local hydrogeological description for both EPL7405 and 7406 suggest that the project is underlain by a massive impermeable hard rock formation which is normally associated with very little or no groundwater resources at all. The extent of this hard rock formation within the project area was further inferred through the aeromagnetic data analysis. Due to the unavailability of local recharge potential, there is a less likely chance of groundwater contamination as the local hydrogeology suggested a system that does not possesses sufficient permeability for local groundwater flow. However, there is potential contamination from iron oxide and other related chemicals from the banded iron formation which forms part of the mineralisation as indicated in the previous section and would need regular monitoring and an establishment of a groundwater monitoring network (boreholes) around the project area.

3 Conclusions

The analysis presented in this report as shown that groundwater potential of the area is generally classified as low to locally moderate based on physical and environmental factors such as regional geology, lithology, land use land cover and rainfall which are all controlling the groundwater occurrence. The geological analysis has demonstrated that the project area his underlain by basement formation which are associated with low groundwater potential and as such there is very minimal effect on the available groundwater resources. In addition, it is also suspected that the high magnetic lithology is source of high TDS and hence where groundwater is available it may not be suitable for portable use.

Based on the analysis presented in the previous sections it is safe to conclude that there is no evidence of possible contamination to any groundwater resources. It is however recommended that the mining activities be accompanied by a continuous groundwater monitoring network in and around the mining premises so as to mitigate against potential effects of groundwater contamination.

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