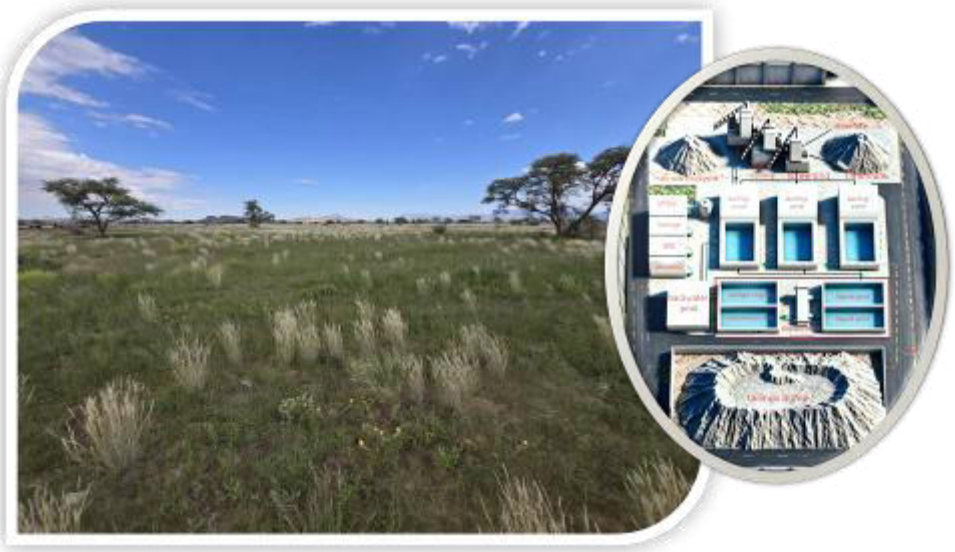
ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

SCOPING REPORT

CONSTRUCTION OF A SMALL-SCALE SPONGE COPPER PRODUCTION PLANT

KARIBIB INDUSTRIAL AREA, PLOT 57, KARIBIB CONSTITUENCY, ERONGO REGION (NAMIBIA)



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ACRONYMS

BID	Background Information Document
DEAF	Department of Environmental Affairs and Forestry
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
EIA (R)	Environmental Impact Assessment (Report)
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
I&Aps	Interested and Affected Parties
MEFT	Ministry of Environment, Forestry and Tourism
NEMA	Namibia Environmental Management Act

DEFINITION OF TERMS

The "**Consultant"** – means the team responsible for conducting the ESIA and the preparation of the ESMP for the proposed project or development.

The **"Proponent"** – this refers to the legal entity responsible for the overall implementation and management of the proposed project or development, e.g., RA.

The **"Stakeholders"** – include local communities, international community and institutions (state and non-state actors) who are directly or indirectly affected and/or with interest in the proposed project or development.

The **"Environment"** – include the socio-economic and biophysical aspects.

CHAPTER 1: INTRODUCTION

1.1 Executive Summary and Overview

HJ Gold Bay Investment (Pty) Ltd has developed an economical and efficient technological process for producing sponge copper a from low-grade copper oxide ore found in Namibia. This project will be known as Gold Bay Minerals, and it will be located in Karibib Townlands, on Plot No. 57 (Figure 1). Plot 57 is zoned as an industrial area.

The proposed project involves the construction and operation of a sponge copper production plant with a production capacity of approximately 600 tons per annum (tpa) in Karibib Town, Erongo Region, Namibia. Copper-bearing ore will be mined approximately 30 km from the processing plant and transported by haul trucks to the plant for beneficiation and sponge copper production.

The project aims to contribute to Namibia's mineral beneficiation strategy, create employment opportunities, stimulate local economic growth, and support downstream industrialization.

This assessment evaluates the proposed project of a sponge copper production facility in Karibib. Sponge copper, a porous copper product generated via hydrometallurgical (displacement) processes, offers a lower-energy alternative to traditional smelting.

With the implementation of the proposed mitigation measures (paving of the plant, lining of ponds, lining and bunding of waste storage area, waste reuse, zero liquid discharge, and dust suppression), the project is deemed viable.

Figure 1: Copper Processing Plant Locality S-21.961071° E15.844393° (Google Earth, 2026)

Key Findings:

- Environmental: The primary risks include chemical spills (sulfuric acid), groundwater contamination, and dust emissions during off-loading of ore. However, with mitigation measures, these risks can be maintained at Low to levels.
- Social: High potential for positive impact (jobs, local content/procurement). The main social risk relates to influx of job seekers and pressure on existing housing, though Karibib's recent infrastructure upgrades provide some buffer.
- Regulatory: The project requires an Environmental Clearance Certificate (ECC) before construction.

Recommendation: Approval is recommended subject to the full implementation of the Environmental and Social Management Plan (ESMP), specifically regarding lining of ponds and zero-discharge water management.

1.2 Project Proponent

HJ Gold Bay Investment (Pty) Ltd is a Namibian company registered in 2024. Its main purpose is to participate in the mining sector, particularly in the copper production industry.

Thus, HJ Gold Bay Investment (Pty) Ltd and another local company named Legend Nafuka Mining and Trading CC are in a Joint Venture and have developed an economical and efficient technological process for producing sponge copper a from low grade copper oxide ore. The project will be known as, Gold Bay Minerals.

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1.3 Purpose of the EIA

This EIA study aims to identify, analyse and present the environmental impacts (positive and negative) of the proposed project and associated infrastructure. The EIA will also formulate remedial measures to avoid, minimise and mitigate the negative impacts. This assessment process will also inform the various parties to plan in such a way that enables rational decisions are made regarding the implementation and management of the proposed project.

This EIA will further contribute to the reduction or mitigation of adverse impacts by generating a number of project alternatives for the proposed development. In general, the purpose of this EIA is to anticipate and prevent, minimise and/or manage, potentially significant negative impacts of the project that may:

- Cost too much money to rectify in the future;
- Pose risk to lives, livelihood or health of current and future generations;
- Result in irreplaceable loss of resources and reduced options for future well-being; and,
- Help to seek opportunities to optimise potential benefits of development.

As a responsible mining company, the Proponent is committed to enhancing positive biophysical and social environmental impacts of the project while mitigating negative impacts of the project. During the scoping exercise, the Proponent has emphasized that it attaches great importance to environmental sustainability and human well-being. The Proponent also recognizes the strong correlation between environmental sustainability and human well-being through good health that depends on healthy ecosystems, clean water and air. All of the above is further appreciated by the direct experience in sustainable copper production.

Therefore, this Environmental Impact Assessment Report has been prepared with a view to comply with the Namibia's Environmental Assessment Policy of 1995, the Environmental Management Act No. 7 of 2007 (Section 27), Government Notice No. 29 of 2012 (Listed Activities) and the Government Notice No. 30 of 2012 (EIA Regulations).

1.4 Scope of the EIA Study

Trinity Environmental Solutions (TES) undertook to carry out the EIA study by following a well-defined framework. Owing to the importance of Interested and Affected Parties (I&APs) involvement in environmental studies. The EIA team ensured that I&APs consultations were central to every step of this EIA process.

The scope of the EIA study comprised of a site public meeting, I&APs consultations and detailed site-specific investigations. Details of each process component are elaborated below.

Scoping Exercise

The scoping exercise aimed at identifying and screening all relevant issues related to the development project as well as identifying at the earliest possible time whether any adverse effects existed that could render the proposed project environmentally unacceptable. Specifically, scoping assisted in:

- Focusing the impact assessment on a manageable number of important questions on which decision making is expected to focus;
- Ensuring that only key issues and reasonable alternatives are examined;
- Informing the interested and affected parties and other key stakeholders about the project and to obtain their inputs, issues and concerns; and,
- Identifying fatal flaws in the proposed project planning.

Description of Existing Environmental Conditions

To establish prevailing environmental conditions for the project area, environmental and socio-economic data including surrounding areas was collected, compiled and analysed. Findings of the analysis are presented in the following Sections. Biological, zoological, botanical and socio-economic studies carried out in the past for the area provided secondary data for the report.

Description of Project Activities

Project inputs, activities and outputs during project preparation, construction and operational life stages were reviewed and are described in this section. This section also includes description of project alternatives.

Analysis of Potential Environmental Impacts

An assessment of environmental effects and benefits of the proposed project regarding biophysical and socio-economic environment has been undertaken as well as an analysis of the impacts' extent, duration, intensity and significance.

Formulation of Possible Mitigating Measures

Based on the analysis of findings, a number of measures and plans for mitigating the identified possible adverse environmental impacts of the project are proposed. Further, the report proposes measures and plans for enhancing positive environmental impacts of the project. And wherever possible, the costs and benefits of these environmental measures are quantified.

Elaboration of an Environmental and Social Management Plan

An Environmental and Social Management Plan (ESMP) for implementing the proposed mitigating measures during the project preparation, construction and operation phases of the project was developed. The ESMP further indicates management responsibilities and time frames.

1.5 Stakeholder Consultations

TES's approach to environmental assessment studies is aimed at ensuring that wide stakeholder participation and involvement is achieved. Recognising this, and as part of the transparent consultative process aimed at taking public views into account in determining the scope of the EIA, a public consultative process started in the area early as February 2026. A public site meeting was held on 15 April 2026 in Karibib, Plot 57. The meeting was announced locally through the Karibib Town Council's online platforms, and newspapers advertisements where also placed in the Namibian and New Era. A site notice was also put up onsite, see Figure 2.

The total number of participants in the meeting was 17 (Figure 3 and Figure 4) representing mainly the local community of which the youth was the majority, Private Sector, and representatives from the Ministry of Environment, Tourism and Forestry (MEFT). MEFT Officers who attended the meeting wrote a letter, **see Appendix A**.

Telephonic communication also took place and Background Information Documents (**Appendix B**) were shared with the various stakeholders and I&APs via email and WhatsApp.

Figure 2: Site Notice (15 April 2026)

Figure 3: Public Meeting on site in Karibib (15 April 2026)

Figure 4: Public Meeting held on site (15 April 2026)

Key Registered Interested and Affected Parties consulted include:

- Karibib Town Council
- Neighbouring Plot owners
- Ministry of Industries, Mines and Energy (MIME)
- Ministry of Environment, Tourism and Forestry (MEFT)
- Namibia Chambers of Environment (NCE)

1.5.1 Methodology

The Interested and Affected Parties (I&APs) consultative process involved meetings, open discussions and interviews with relevant government institutions and representatives from the local community. Through these interactions, the EIA team tried to establish how Interested and Affected Parties understood the dynamics of the environment in which the proposed project is located and any possible underlying causes that could lead to changes over time as a result of implementing the project.

Where the EIA team felt it necessary to go more in-depth on a particular matter, Interested and Affected Parties within the project area or surrounding area with either

experience or expert knowledge of the study area were identified and interviewed to validate the information already obtained, as well as to get their advice on any additional sources of information that was not readily available. This was useful in interpreting any underlying factors of the trends already observed.

The outcome of these Interested and Affected Parties consultations and interviews further provided relevant background information to this report and helped identify potential environmental issues of concerns within the project area.

1.5.2 Stakeholder Consultation Outcome

The meetings and informal interviews conducted did not raise any objections against the proposed development. Key component of the proposed development is that it is a brown fields activity that will affect an area of about 2.4 hectare (ha) in an industrial zone within the Karibib Townlands. About 1 hectare of the 2.4ha has been used as dumbing area for building rumble. Some of the local communities didn't fully comprehend why we still needed to conduct such an extensive consultation about the proposed development, since the need for jobs creation was huge in Karibib, where over 50% of youth are unemployed.

List of matters arising from the public meeting:

- Site meeting
    - Local employment opportunities concern, because contractors sometimes employ people from outside.
    - When the project will start with its operations and how many people will be employed.
    - Will there be any pollution of the soil and groundwater.

During the various formal consultations from February 2026 to May 2026 with members of the local community, owners of the neighbouring Plots, Town Council, MEFT and MIME, no objections were raised against the construction of the copper processing

plant. The proposed project is seen as a priority, a must development desperately needed for jobs creation as long as it does not lead to soil and groundwater pollution.

1.5.3 EIA Study Team

TES is a firm of environmental consultants that has been active in Namibia since its establishment in 2012. TES staff have extensive experience in a variety of projects related to EIAs, socio-economic, water resources management, sustainable land management and on climate change mitigation.

Previous and Current Projects inter alia include:

- EIA and EMP for the development of Ruacana Quarry.
- EIA and EMP for new wastewater treatment ponds for Engela, Groot Aub, Andara, Onesi, Ogongo towns and villages.
- EIA and EMP the construction of an Industrial and Business Estate in Lubumbashi area, Democratic Republic of Congo.
- EIA and EMP for Osona Township development near Okahandja.
- EIAs and EMPs for the upgrading of DR3427 to Gravel Standard.
- EIAs and EMPs for the upgrading of DR3403 to Bitumen standards.
- EIAs and EMPs for the upgrading of two gravel roads, DR3608 and MR67 to bitumen standards, approximately 185km in total length.
- Supervision of the Environmental Monitoring and Auditing for various construction projects.

Don Muroua, Lead Environmental Assessment Practitioner: Mr. Muroua has compiled this Scoping Report and the ESMP. He also conducted the overall environmental assessment and public participation activities. Mr. Muroua is a qualified environmental manager and a founding member of the Environmental Assessment Practitioners of Namibia (EAPAN). He is familiar with conducting EIA studies, preparing EIA reports and ESMPs, conducting specialist studies which include socio-economic assessments and ecological studies. Mr. Muroua is also a Professional Member of the Southern African Institute of Ecologists and Environmental Scientists (SAIEES).

Apart from Namibia, Mr. Muroua' experience extends across numerous countries including the Democratic Republic of Congo, South Africa, Malawi, Swaziland and Kenya.

CHAPTER 2: DESCRIPTION OF PROPOSED PROJECT

2.1 Location

The Environmental Clearance Certificate is applied for the construction of a sponge copper processing plant in Karibib's Industrial Zone, on Plot 57. The size of the area to be affected is 2.4ha.

The approximate GPS coordinates are S -21.961071° E 15.844393°, Figure 5.

Figure 5: Site GPS Coordinates (Google Earth, 2026)

2.2 Project Rationale

With the continuous growth of global copper resource demand, the efficient utilization of low-grade copper oxide ore has become an important issue in the metallurgical field. Sponge copper, as an important copper intermediate product, is widely used in electronics, chemical industry and other industries. This project will deploy an economical and efficient technological process for producing sponge copper from low-grade copper oxide ore, so as to improve resource utilization and reduce production costs.

At present, copper oxide ore resources are widely distributed but generally of low-grade. Traditional pyrometallurgical smelting has high energy consumption and heavy pollution, while hydro-metallurgical technology has attracted much attention due to its environmental friendliness and adaptability to low-grade ore. Through systematic optimization of each link of the process, this project has established a complete hydro-metallurgical technical route for producing sponge copper, providing a reliable reference for industrial application.

HJ Gold Bay Investment (Pty) Ltd and Legend Nafuka Mining and Trading CC have together to developed an economical and efficient technological process for producing sponge copper from low grade copper oxide ore. Generally, the copper ore in Namibia is very poor, hence need very large plants to process it.

Moreover, this processing plant will also provide processing services for legally sourced low grade ore from small-miners in the surrounding areas, increasing the income of small-miners with low-grade solutions. The processing of legally sourced ore will enhance the value of low-grade oxidized ore. It will also offer beneficiation tests for large-scale exploration projects of exploration companies, reducing the cost of beneficiation tests.

The objective is to create a market hub within the town and constituency by buying ore from the local community members and then process. HJ Gold Bay Investment (Pty) Ltd commits to uphold its social responsibilities towards the Karibib Town Council.

The construction of this plant will contribute to poverty alleviation as outlined in NDP6 and Harambee Prosperity Plan (HPP). The construction and operations of the plant will provide jobs to the surrounding communities, create new markets for small-miner, and will also create new business opportunities for local logistic companies. Overall, the Karibib Town Council benefit through increased business activities within its townlands.

2.3 Project Description and Alternatives

2.3.1 Project Description

Application for the Environmental Clearance from the Directorate of Environmental Affairs and Forestry (DEAF) is being made for the construction of a sponge copper processing plant.

The physical footprint of the project will be on a 2.4ha area, zoned for industrial activities in Karibib Town, about 2km south of Karibib CBD and residential areas.

The overall project will include the following activities below:
Construction works envisaged will include:

a) Earth works to dig out ponds [each 12m width (or 6m width) x 25m long x1.5m deep] for leaching, processing, and dewatering & drying of materials.
b) Installation of short-term chemicals storage tanks.
c) Installation of water tanks.
d) Installation of sponge copper settling tanks.
e) Installation of in-situ mixing and vibrating mill.

Operations/production activities will include:

a) Transporting crashed low-grade copper ore from mining site (±30km away) to processing plant in Karibib.
b) Storage of ore and depositing into ponds for processing.
c) Leaching process and condition control.
d) Purification and solution treatment system: The leach-ate contains impurities such as (Iron) Fe and (Aluminum) Al, which need to be purified by neutralization precipitation, solvent extraction or ion exchange.
e) Reduction process and sponge copper generation.
f) Product (sponge copper) treatment and quality control.
g) Waste treatment and resource utilization (reuse)

2.3.2 Plant Layout and Technological Process

HJ GOLD BAY INVESTMENT (PTY) LTD plans to construct a sponge copper processing plant with an annual processing capacity of 100,000 tons of raw ore, expecting an annual output of 600 tons of copper metal equivalent. The project will create more than 5 million Namibian dollars in tax revenue for Namibia, provide over 50 employment and will effectively solve the sales problem of low-grade copper ore for local small-miners, achieving a win-win situation of economic and social benefits.

The plant design, layout and process flow are described below (Figure 6 and Figure 7).

2.3.2.1 Raw Material Preparation and Pre-treatment System:

Raw material preparation and pre-treatment are the primary links in production, which directly affect the subsequent processes and product quality. Raw material preparation requires proper collection, transportation and storage of ore to prevent oxidation and pollution; pre-treatment includes crushing, grinding and screening. A two-stage or three-stage crushing process is adopted, and the ore is refined by ball mill/rod mill. Crushing and milling will take place at the mining site, and not at the processing site at Karibib.

Screening ensures uniform particle size, and finally 80% of the ore passes through a 200-mesh sieve to increase the contact area between minerals and leaching agent.

2.3.2.2 Leaching Process and Condition Control:

Leaching is the core process, whose purpose is to dissolve copper from the ore, with sulfuric acid (3% concentration of sulfuric acid) as the preferred leaching agent. The optimal leaching conditions are as follows: sulfuric acid concentration of 10-15%, temperature of 60-80°C, liquid-solid ratio of 3:1-5:1, and leaching time of 4-6 hours. Under these conditions, the copper leaching rate can reach more than 75%.

During the leaching process, it is necessary to regularly detect the copper ion concentration and adjust the parameters. After leaching, the copper-containing leach-ate is obtained by solid-liquid separation, and the leaching residue can be further treated after washing.

2.3.2.3 Purification and Solution Treatment System:

The leach-ate contains impurities such as Fe and Al, which need to be purified by neutralization precipitation, solvent extraction or ion exchange. Among them, solvent extraction has a good purification effect. After purification, the copper concentration of the solution should reach 30-50g/L and the impurity content should be less than 1g/L. At the same time, the temperature is adjusted and stabilizers are added to create conditions for the reduction process.

2.3.2.4 Reduction Process and Sponge Copper Generation System:

Reduction is the key step to convert copper ions into metallic copper. Common reducing agents include iron powder, sulfur dioxide and hydrogen. The reduction process controls the pH value at 1.5-2.5, the temperature at 60-70°C, and the time at 2-3 hours. The end point of the reaction can be determined by observing the color change of the solution or measuring the residual copper ion concentration. The porous sponge copper generated

by reduction needs to be subjected to solid-liquid separation immediately to prevent oxidation.

2.3.2.5 Product Treatment and Quality Control System

Sponge copper needs to go through post-treatment processes such as washing with deionized water/dilute acid, low-temperature drying at 80-100℃, and briquetting/granulation. Quality control includes chemical composition, physical performance and micro structure detection. High-quality sponge copper should have a copper content of ≥83%, total impurity content of ≤2%, and bulk density of 1.2-1.8g/cm³ to ensure compliance with industry standards.

2.3.2.6 Three-Waste Treatment and Resource Utilization

1. Wastewater Treatment: Neutralization precipitation with lime milk (pH adjusted to 8-9, heavy metal precipitation rate >99%) and reverse osmosis membrane separation technology (sulfuric acid reuse rate >80%) are adopted;
2. Leaching Residue Utilization: 30%-40% of leaching residue can be added to produce non-fired bricks, or residual iron minerals can be recovered by magnetic separation.

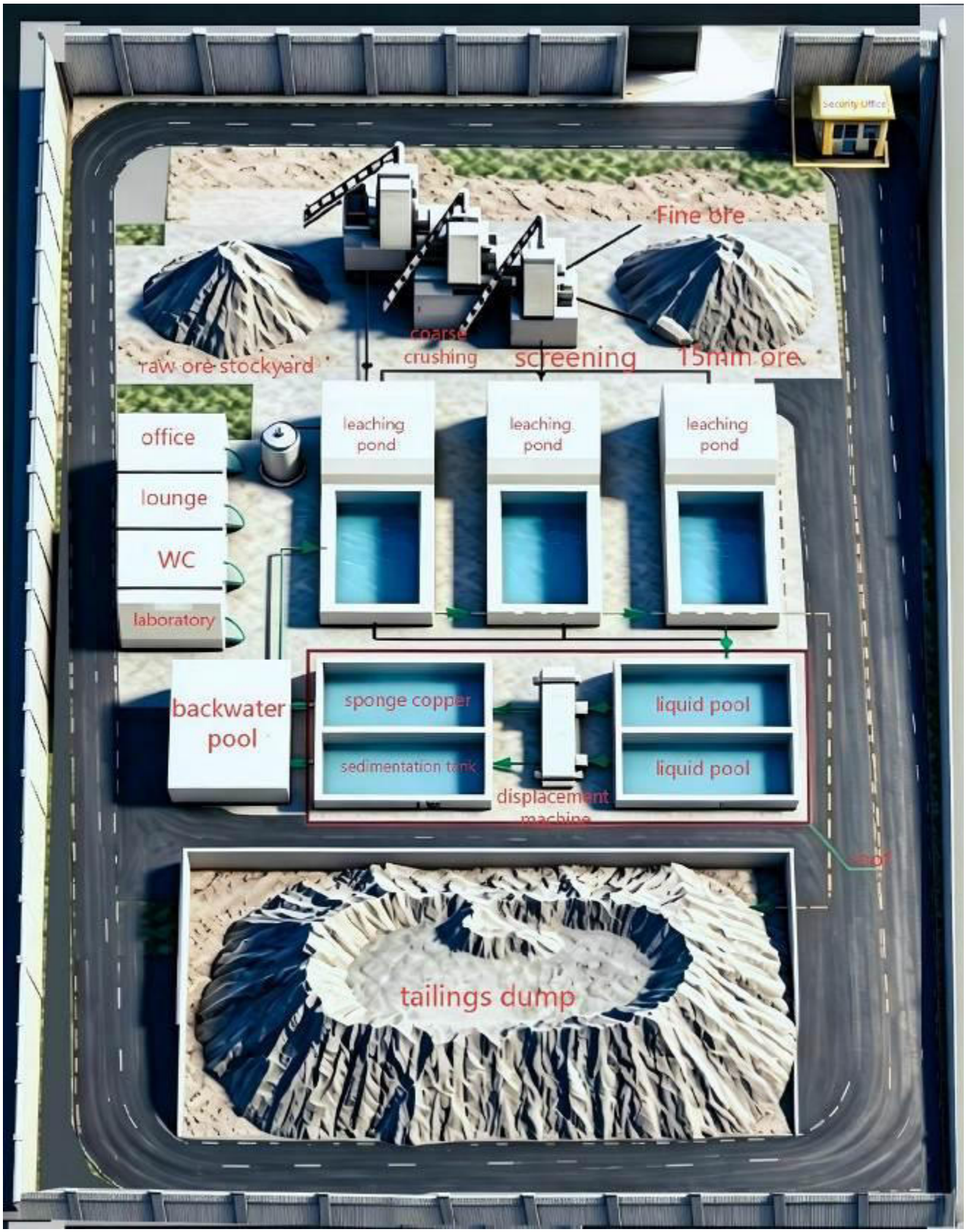

Figure 6: Plant Design and Processing Flow

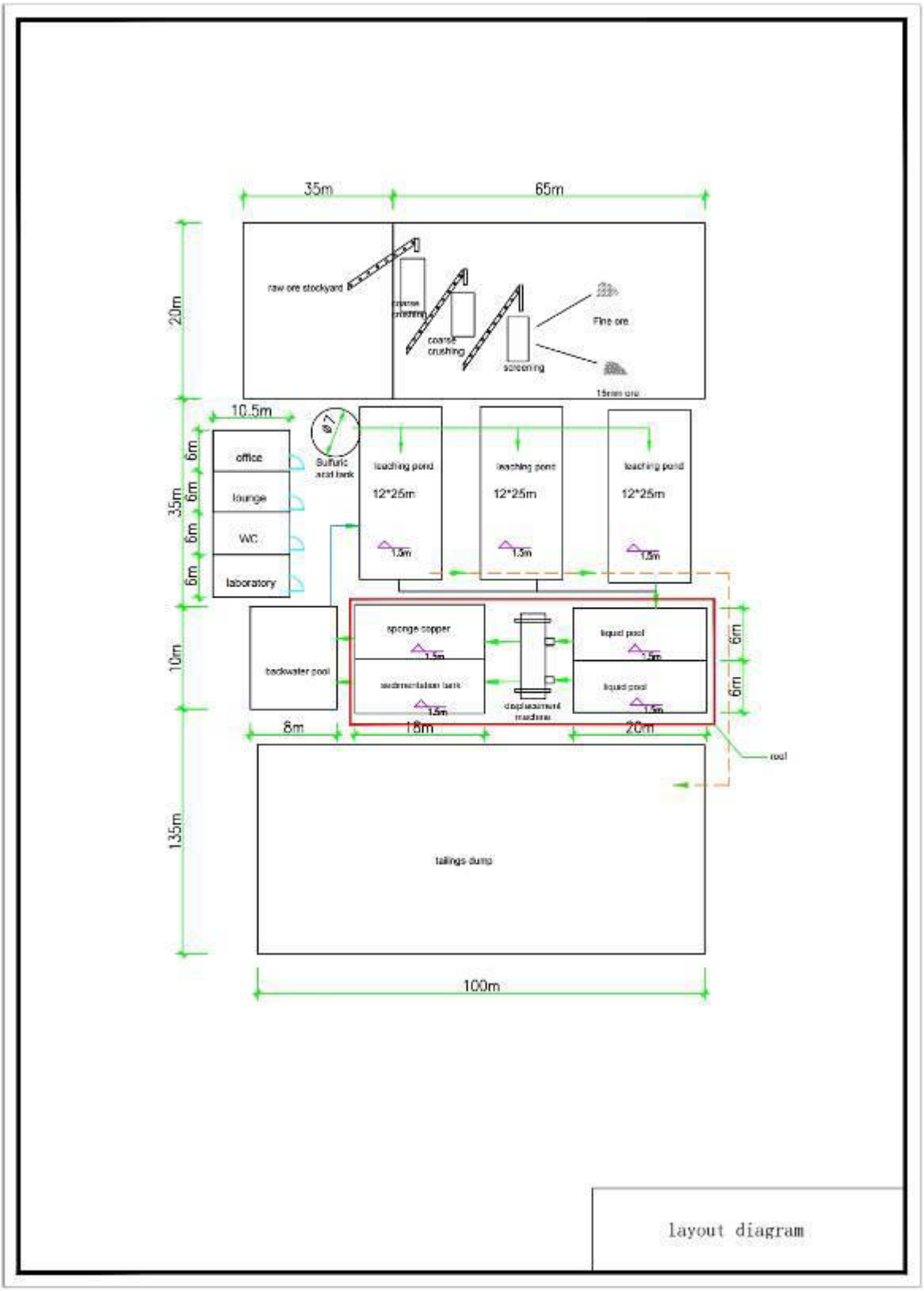

Figure 7: Plant Layout Diagram (see also **Appendix C**)

2.3.3 Project Alternatives

As shown in Figure 6 and Figure 7 above, the design, layout and processing flow was established to be the most efficient after various tests, especially when dealing with low-grade copper ore in Namibia.

2.4 No-Go Alternative

No-Go Alternative: If this option is selected, the development will not proceed. In essence, the no-go alternative would ultimately imply that the status quo would be retained as it is presently, with obvious advantages and disadvantages. The benefits of continuing with this proposed construction and operations of the plant significantly outweigh the loss of less than 3ha of townlands, zoned for industrial development.

The Department of Environmental Affairs and Forestry (DEAF) of the MEFT stresses that the no-go alternative should only be considered in cases where the proposed development will have a significant negative impact that cannot be effectively or satisfactorily mitigated against.

The limited negative impacts from this proposed development can be effectively and satisfactorily mitigated.

CHAPTER 3: LEGAL, REGULATION AND POLICY FRAMEWORK

The Table 1 below summarises the legislation and policy guidelines that are relevant to the proposed project and is not exhaustive.

Table 1: Relevant legislations and policy guidelines

Title of legislation, policy or guideline	Implications for proposed project (Please read all Acts with their Regulations)
The Namibian Constitution of 1990	The Constitution clearly indicates that the State shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.
Water Resources Management Act No. 11 of 2013	This Act protects all water resources in Namibia. The Act also laid down conditions to ensure that proper wastewater treatment is provided, including requirement for wastewater discharge permit from the Directorate of Water Affairs.
Environmental Assessment Policy of Namibia (1995)	The Policy seeks to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.
Environmental Management Act No. 7 of 2007	The Act provides a list of projects requiring an Environmental Assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment.
Minerals (Prospecting and Mining) Amendment Act 8 of 2008	The Act provides for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto.
Labour Act No. 11 of 2007)	Consolidate and amend the labour law; to establish a comprehensive labour law for all employers and employees; to entrench fundamental labour rights and protections; to regulate basic terms and conditions of employment; to ensure the health, safety and welfare of employees; to protect employees from unfair labour practices; to regulate the registration of trade unions and employers' organisations; to regulate collective labour relations; to provide for the systematic prevention and resolution of labour disputes; to establish the Labour Advisory Council, the Labour Court, the Wages Commission and the labour inspectorate; to provide for the appointment of the Labour Commissioner and the Deputy Labour Commissioner; and to provide for incidental matters.
Nature Conservation Ordinance Number 4 of 1975 (as amended)	Guide the conservation of nature; the establishment of game parks and nature reserves; the control of problem animals; and to provide for matters incidental thereto.
Public and Environmental Health Act, 2015 (Act No. 1 of 2015).	The Act provides a framework for a structured uniform public and environmental health system in Namibia; and to provide for incidental matters This Act makes provision for the prevention and control of infectious diseases, venereal diseases and epidemics. It also regulates sanitation, food and public water supplies.
MEFT Policy Document - Community-Based Tourism Development (June 1995)	This document contains the approved Ministry policy for providing support to, and encouraging the development of, community-run tourism activities and enterprises on communal land. This policy document provides a framework for ensuring that local communities have

	access to opportunities in tourism development and are able to share in the benefits of tourism activities that take place on their land. Support for the involvement of rural communities in tourism enterprises is important: a) to implement the government policy of giving communities access to development opportunities and b) because where tourism is linked to wildlife and wild landscapes, the benefits to local communities can provide important incentives for conservation of these resources.
Act No.5, 1996 Nature Conservation Amendment ACT, 1996	These amendments to the Nature Conservation Ordinance of 1975, provide for an economically based system of sustainable management and utilisation of game in communal areas. This amend allows for the formation of Conservancies in communal areas.
Hazardous Substances Ordinance No. 14 of 1974	The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings. Hydrocarbons handled during the construction phase may be hazardous thus careful handling and management is vital to prevent spills, explosions, ill-health or death.
Pollution Control and Waste Management Bill of 1999	The Bill promotes sustainable development and the establishment of the Pollution Control and Waste Management Unit; to prevent and regulate the discharge of pollutants to the air, water and land; to make provision for the establishment of an appropriate framework for integrated pollution prevention and control; to regulate noise, dust and odour pollution; to establish a system of waste planning and management; and to enable Namibia to comply with its obligations under international law in this regard.
Draft Wetlands Policy of 2004	This policy strives to complement existing policy instruments regarding sustainable development and sound natural resource management in Namibia. Its implementation provides a platform for the conservation and wise use of wetlands, thus promoting inter- generational equity regarding wetland resource utilisation. Furthermore, it facilitates the Nation's efforts to meet its commitments as a signatory to the International Convention on Wetlands (Ramsar) and other Multinational Environmental Agreements (MEA's).
National Waste Management Policy, 2010	This policy is focusing specifically on Waste Management and use of various technologies waste treatment and disposal to minimize health risks. It is also geared to have a unified waste management system country wide. This policy provides the necessary guidance on the processes related to waste management in the MOHSS, wider Namibia health and social welfare sectors, and other relevant stakeholders. It is taking into consideration the process of integrated waste management from generation to final disposal. This practice also focus on medical, household, mining, agricultural, and construction waste.
Forest Act No. 12 of 2001 and its amendments	The purpose of this Act guides the use and management of forestry and related resources. The aims of the forest management as per the Act, is to achieve manage of forest "for which forest resources are managed and developed, including the planting of trees where necessary, to conserve soil and water resources, maintain biological diversity and to use forest produce in a way which is compatible with the forest's primary role as the protector and enhancer of the natural environment."
National Heritage Act No. 27 of 2004	The Act provide 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.
Communal Land Reform Act 5 of 2002	This Act provides for the allocation of rights in respect of communal land; to establish Communal Land Boards; to provide for the powers of Chiefs and Traditional Authorities and boards in relation to communal land. The alignment of the development, use of water and siting of borrow pits, should consider provisions of this

	Act in terms of rights of communal people.
The Regional Councils Act No. 22 of 1992	This Act sets out the conditions under which Regional Councils must be elected and administer each delineated region. From a land use and project planning point of view, their duties include, as described in Section 28 "to undertake the planning of the development of the region for which it has been established with a view to physical, social and economic characteristics, urbanisation patterns, natural resources, economic development potential, infrastructure, land utilisation pattern and sensitivity of the natural environment." RC are import I&APs
Roads Ordinance No 17 of 1972	The Ordinance consolidates the laws relating to roads. **a)** Section 3.1 deals with width of proclaimed roads and road reserve boundaries. **b)** Section 27.1 is concerned with the control of traffic on urban trunk and main roads. **c)** Section 36.1 regulates rails, tracks, bridges, wires, cables, subways or culverts across or under proclaimed roads. **d)** Section 37.1 deals with infringements and obstructions on and interference with proclaimed roads.

CHAPTER 4: DESCRIPTION OF EXISTING ENVIRONMENT

The Erongo Region has a population of 240 206, and 90% lives in urban areas (NSA, 2023). The Region is a well-established mining hub, hosting operations like the Navachab Gold Mine, Rossing Uranium Mine, marble and dimension stone quarrying, etc. which have demonstrated the viability of large-scale industrial activity in the region. Karibib Town is one of the larger urban areas in the Erongo Region with about 8434 people (NSA, 2023). Unemployment in youth is a challenge just like elsewhere in Namibia.

4.1 Physical Environment

Karibib is located in the Erongo Region of central-western Namibia, approximately 170 km north-west of Windhoek along the B2 national road corridor toward Walvis Bay. Its bio-physical environment is characteristic of Namibia's semi-arid central plateau and Savannah ecosystems.

Karibib lies on Namibia's central plateau at an elevation of approximately 1,200–1,500 metres above sea level. Key topographical characteristics include:

- Gently undulating plains
- Rocky outcrops and granite inselbergs
- Low hills and escarpment features
- Broad ephemeral drainage channels

The landscape is generally open, with sparse woody vegetation interspersed with grassland and rocky terrain, see Figure 8 below.

Figure 8: Karibib Landscape

Terrestrial diversity is very low in and surrounding areas of Karibib. There are no core wildlife areas and national parks near Karibib. The most conspicuous and important feature in the area is the semi-arid rangeland.

4.1.1 Climate and Temperature

Karibib experiences a semi-arid climate with strong seasonal variability. Temperatures are typical hot in Summer (October to March) 25°C –38°C and ranges 5°C –25°C in Winter (May to August). Night-time winter temperatures can approach freezing levels.

The climate features high evaporation rates, large diurnal temperature fluctuations, intense solar radiation and low humidity.

The amount, timing and effectiveness of rainfall varies greatly from year to year and also from place to place, making rain-fed crop production not possible. The rainfall is low and erratic, seasonal (mainly November–April), highly variable between years averaging annually between 200–350 mm/year.

The rain is characterised by periodic droughts, when it rains commonly in a form of short-duration thunderstorms, and flash runoff during intense rainfall events.

4.1.2 Soils, Geology and hydrogeology

Karibib lies within geologically significant mineral-bearing formations of the Damara Orogenic Belt. Economic mineral resources found within this belt include gold (e.g., Navachab area), marble and dimension stone, industrial minerals and copper. The geology strongly influences the soil development, groundwater occurrence, land stability and mining potential.

Dominant geology includes:

- Metamorphic rocks
- Schists
- Quartzites
- Marble formations
- Granitic intrusions

Plot 57 has generally shallow to moderately deep sandy-loam soils. With low levels of organic matter and moderate to poor fertility.

The site in generally flat, with no surface water features, see Figure 9 below.

Groundwater is the principal water source and characteristically borehole-dependent, with variable recharge rates. Karibib Town's portable water is pumped from the Swakoppoort Dam and no boreholes water is currently used to meet Town's needs.

Figure 9: Site Topography

4.1.4 Air Quality

An assessment of the baseline air quality status in the project area and surroundings was carried out in order to assess the possible impacts on the air quality due to certain project activities with the potential of releasing pollutants to the ambient air. Field surveys showed that fugitive dust from vehicles using the C 32 road is the main source of air pollution. Noise population is also emanating from vehicles using this road.

The observed air pollution did not remain hanging over the area for prolonged periods and as such no haze was reported to be a distinctive result of vehicles use. Apart from pollution caused by vehicles, the air quality in the area was found to be very good.

4.2 Biological Environment

4.2.1 Approach

The methodology used to describe the site's biological environment took into consideration the purpose of the study, extent of development site, and the flora and fauna species composition.

It should be noted that the 100% of the proposed activity will be constructed on a brownfield site, where building rumble exist (Figure 10), and other activities are taking place, see Figure 11 and Figure 12.

Figure 10: Building Rumble onsite

Figure 11: Current Infrastructure on the Neighbouring Plot to the south of the site

Figure 12: A construction campsite on the Neighbouring Plot

4.2.2 Flora

Karibib and Plot 57 bio-physical environment is characteristic of Namibia's semi-arid central plateau and savanna ecosystems.

Specifically, Plot 57 due to the limitations of the climate, it's vegetation is very homogeneous and open. Dominated by S. uniplumus grass, some annual herbaceous bushes, two (2) *Boscia foetida*, about nine (nine) *Senegalia mellifera* (*Acacia mellifera*) and three (3) *Vachellia erioloba* (*Acacia erioloba*), see Figure 9 above.

4.2.3 Fauna

Due to the proximity of the site within Karibib, this area has no conservation value. Plot 57 and surrounding areas do not support any viable wildlife population and none of the large or rare and endangered species were observed or reported to be inhabiting the area.

4.3. Socio-economic Environment

4.3.1 Introduction and Demography

Karibib Constituency has a population of about 19 705 (NSA, 2023), and Karibib Town being its capital. Karibib Town has experienced steady population growth over the past two decades, largely linked to mining, transport connectivity, and urbanisation. In the 2011 Census, the population of the town was approximately 5,100. The 2023 Census put the town's population at approximately 8,400 residents. This suggests growth of roughly 60–65% over the past 12 years, indicating moderate urban expansion. Hence, over 40% of the Constituency's population lives in Karibib.

The tendency to migrate to urban areas due to the (often incorrect) perception of more employment opportunities can also be seen in the "urban" centers of especially into Karibib Town. The Karibib Constituency had an unemployment rate of more than 40%

during the 2011 National Census. At present, it is expected that this rate increased as per the national trend.

4.3.2 Land Tenure

The 2.4ha of property where the project area is located is a proclaimed industrial zone, within the Karibib Townlands.

Therefore, no significant loss of land for use for other important developmental projects will take place.

4.3.3 Archaeological and Cultural Sites

No sites of archaeological and cultural importance were recorded or reported to be present.

4.3.4 Existing Infrastructure

The site is surrounded by other projects of industrial nature, see Figure 11 above. More such developments will be constructed within this industrial zone.

CHAPTER 5: POTENTIAL ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACTS

5.1 General Considerations

The objective of assessing the potential effects of the proposed project was essentially to permit planning of actions to avoid or reduce undesirable effects and/or to enhance secondary benefits of the project. Implementation of a project may exert a suite of effects during the construction and operation stages. It is therefore common practice to discuss the effects of the project construction and operations (including preparatory phase) before the project commences.

Therefore, this section of the report addresses the interactions of the project with the bio-physical and socio-economic environment in and around the project site. These interactions are normally known as 'impacts'. It is worthwhile separating project effects into direct (or primary) effects resulting from direct interaction of some components of the project with the environment, and indirect (or secondary) effects which arise from the primary effects. Note that a classification of negative effect does not necessarily imply a long-term adverse effect on the environment. It may as well indicate an irreversible change to the physical environment from original conditions. In some cases, these irreversible changes can result in favourable long-term effects.

5.2 Prediction of Impacts

The Proponent is aware of the fact that the proposed project will have both negative and positive impacts. Importantly, the negative impacts are mainly related to the construction and operation activities, and limited to the site. In predicting possible impacts, the following impact zones were applied:

a) Zones influenced by land use changes: area where the development will be carried out.
b) Zones influenced by activities associated with the construction: road upgrading and construction impact zone, camp establishment area, access roads and local communities.

c) Zones influenced by activities associated with the operations of the development: area that will be impacted on due to human activities arising from the upgraded road and support infrastructure.

Prediction of impacts of the proposed project was carried out with the aid of appropriate analytical techniques. However, certain ecological aspects do not lend themselves to straight forward quantification. In such instances, expert judgement by members of the multi-disciplinary EIA team was employed.

5.3 General Impacts

A number of impacts (positive and negative) were identified with due consideration to issues discussed in the earlier Sections. These impacts are based on the design of the infrastructure development, project details, environmental and socio-economic baseline studies, stakeholder consultations as well as expert judgment.

5.4 Impact Criterion and Classification

For purposes of this report, classification of possible impacts and criterion used are highlighted in the Table 2 below.

Table 2: Criterion and classification of impacts

Assessment Evaluation Criteria	**Rating (Severity)**	
Impact Type	**-**	Negative
	=	No Impact or Negligible Impact
	+	Positive
Extent of impact	**I**	Immediate (the site and immediate surroundings)
	L	Local
	R	Regional
	N	National
	IT	International
Duration of impact	**ST**	Short term (0-5 years)
	MT	Medium term (5-15 years)
	LT	Long term (lifetime of the development)
Intensity of impact	**L**	Low (where natural, cultural and social functions and processes are not affected)
	M	Medium (where the affected environment is altered but natural, cultural and social functions and processes can continue)
	H	High (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 (possibility of impact occurring is low)
	P	Probable (where there is a distinct possibility that it will occur)
	HP	Highly probable (where the impact is most likely to occur)
	D	Definite (where the impact will occur)
Significance of impact	**L**	Low (where natural, cultural and social and economic functions and processes are not affected). In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming
	M	Medium (where 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 (where the affected environment is altered to the extent that natural, cultural, social and economic functions and processes will temporarily or permanently cease). In the case of adverse impacts, 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.

5.5 Potential Impacts

5.5.1 Socio-Economic Impacts

Impact: Increased Employment Opportunities

The development will create job opportunities for the local community members of the Constituency, and for small-miners in Namibia in general. At preparatory, construction and operational stages, local community members will be employed and consequently livelihood support for family members will be improved (short-term and long-term) – in particular as on average, support from one job benefit five family members. ***Currently, there are limited job opportunities in in Karibib Town, that holds over 40% of the entire Constituency population. This development could potentially positively impact at least 500 members of the local community***.

Impact: Increase in Local Population

The development will not have a significant impact on the population size of the area. The proposed development will source a very small number of highly skilled personnel from outside the Constituency during the construction phases, and the rest from the local community. All semi-skilled and unskilled staff will be employed from the area and appropriate training provided. Hence, the possibility of the project to significantly increase the local population is very low.

Impact: Increase in Local Economic Activities

Trading opportunities among the local people are expected to increase. Increased in people employed in the Constituency will also support local trade through increased income in the area.

This will lead to a snow-ball of positive growth for the area, for the next 20 years. Possibly, creating longer-term safety-nets for many families.

Impact: Water Supply Availability

Due to the size of the Plant, this proposed development is unlikely to put pressure on water demand in the Town. Especially that no borehole water is used by the Town, but water is pumped from the Swakoppoort Dam.

Impact: Loss on Cultural Sites

No impact determined.

Impact: Increased Demand for Health Services

During construction, when most labour will be needed, all occupational health related injuries will be referred to the local health facilities for immediate attention. This will not have a significant impact on the capacity of the medical staff and facilities to meet the demand for health care, since most of the employed people will be from the area and already residing within the area. HIV and AIDS programs for the Contractors, Staff and local communities need to be developed and provided so to ensure that the participating people are not exposed to increased risk of contracting HIV and/or spreading it.

Impact: Worker Safety

During the construction phase, heavy machinery will be employed for the various works associated with the construction. Absence of clear safety guidelines may lead to accidents affecting worker's safety and productivity; however, this will risk can be effectively managed during the construction and operations when safety and health guidelines will be available and all workers briefed and trained accordingly as per industry and labour standards and policies.

Impact: Increased Traffic

Increased traffic flow in and out of the area is expected during construction and but will reduce during operations.

Impact: Blasting noise and vibration

No blasting will take place, but limited vibrations from machinery and tools could be perceived as intrusion.

5.5.2 Environmental Impacts

Impact: Displacement of people

No impact.

Impact: Machinery noise and vibration

During the construction and operational phases, noise and vibrations from the vehicles and machineries will result into noise and vibration. This impact will be insignificant. The construction workers and staff are the most vulnerable and therefore they should wear protective gear.

Impact: Water quality

No impact.

Impact: Solid Waste Disposal

Waste will be produced at the site during the setting up of supporting infrastructure and the Plant during the construction phase.

Tailings will be stored temporally onsite, on a bunded and fully lined with HDPE Storage Facility to avoid pollution of soil, surface water and groundwater.

When necessary, tailings will be disposed off at license waste management sites as approved by the Karibib Town Council.

Impact: Air Pollution

The major source of the impact will be dust from vehicles ferrying materials during construction. Due to distance from local communities, this impact will be insignificant. Care should be taken not to expose the staff members from fumes when handling chemicals during the processing of the copper ore. Hence, the relevant safety and health protocols need to be developed, fully implemented and adhered to as per the various laws and standards in handling hazardous substances.

Impact: Loss of Historical and Cultural Sites:

No impact determined.

Impact: Loss of Productive Land

No impact determined.

Impact: Loss of Wildlife Habitat, Indigenous Flora and Fauna

No impact determined on wildlife and their habitants.

There will be loss of vegetation and this is the expected trade-off for these types of development in an urban area. This impact will be insignificant as this will accur only on a 2.4ha industrial zone.

Impact: Erosion of the Top-Soil

The whole plant area will be paved to avoid soil erosion, but most importantly, avoid pollution.

The following Tables below present the proposed impact analysis.

Table 3: Evaluation of impacts during pre-construction phase

PRE-CONSTRUCTION PHASE							
Identified Impact	**Impact Type**	**Extent**	**Duration**	**Intensity**	**Probability**	**Significance**	
						Unmitigated	**Mitigated**
Surface water pollution	**=**						
Ground water pollution	**=**						
Soil erosion	**=**						
Soil pollution	**=**						
Air pollution	**=**						
Land use potential	**=**						
Habitat transformation	**=**						
Fauna displacement	**=**						
Damage to Flora	**=**						
Traffic impacts	**=**						
Visual & aesthetic impacts	**=**						
Social	**+**	**L**	**ST**	**M**	**D**	**L**	**M**
Economic	**+**	**L**	**ST**	**M**	**D**	**L**	**M**

Table 4: Evaluation of impacts during construction phase

CONSTRUCTION PHASE							
Identified Impact	**Impact Type**	**Extent**	**Duration**	**Intensity**	**Probability**	**Significance**	
						Unmitigated	**Mitigated**
Surface water pollution	=						
Ground water pollution	=						
Soil erosion	-	I	ST	L	LP	L	=
Soil pollution	-	I	ST	L	LP	L	=
Air pollution	-	I	ST	L	P	L	=
Land use potential	-	I	ST	L	P	L	=
Habitat transformation	=						
Fauna displacement	=						
Damage to Flora	-	I	LT	L	D	L	=
Traffic impacts	-	I	ST	L	P	L	=
Visual & aesthetic impacts	=						
Social	+	L	ST	M	D	M	H
Economic	+	L	ST	M	D	M	H

Table 5: Evaluation of impacts during operational phase

OPERATIONS PHASE							
Identified Impact	**Impact Type**	**Extent**	**Duration**	**Intensity**	**Probability**	**Significance**	
						Unmitigated	**Mitigated**
Surface water pollution	**=**						
Ground water pollution	**=**						
Soil erosion	**-**	**I**	**ST**	**L**	**P**	**L**	**=**
Soil pollution	**-**	**I**	**ST**	**L**	**P**	**L**	**=**
Air pollution	**=**						
Land use potential	**+**	**L**	**LT**	**M**	**D**	**M**	**H**
Habitat transformation	**=**						
Fauna displacement	**=**						
Damage to Flora	**=**						
Traffic impacts	**=**						
Visual & aesthetic impacts	**=**						
Social	**+**	**N**	**LT**	**M**	**D**	**M**	**H**
Economic	**+**	**N**	**LT**	**M**	**D**	**M**	**H**

CHAPTER 6: ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING PLAN (ESMP)

From the above identification of adverse and positive impacts, measures have been proposed for mitigation. In order to achieve this, an Environmental and Social Management Plan (ESMP) has been developed, see **Appendix D.**

CHAPTER 7: RECOMMENDATION AND CONCLUSION

A project of this magnitude will bring with it both positive and negative environmental and socio-economic impacts. These can be localized to the project site or can also affect areas beyond the project's vicinity. While positive impacts from this development are expected to affect the wider local community and region, the adverse effects can be considered very localized. For this development project, the positive impacts outweigh the negative impacts to which amelioration measures have been proposed to cushion their impacts.

Therefore, we recommend that the project be considered for approval for implementation, especially since the proposed development will be developed within an urban area zoned for these types of projects, and its footprint is only 2.4ha. Thus, unlikely to generate long-term significant negative impacts which cannot be mitigated.

This Scoping Report has revealed that a full EIA will not be required in order to identify gaps in information or to accurately identify all project's aspects that could generate significant negative impacts.

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