

Submitted to: Osino Gold Exploration and Mining
(Pty) Ltd

Attention: Mr Charles Creasy
P O Box 3489
Windhoek
Namibia

SCOPING REPORT:

THE PROPOSED 66 KV OVERHEAD POWERLINE FOR THE TWIN HILLS GOLD PROJECT, ERONGO REGION, NAMIBIA

PROJECT NUMBER: ECC-103-443-REP-06-C

REPORT VERSION: REV 01

DATE: JULY 2023



TITLE AND APPROVAL PAGE

Project Name: The proposed 66 kV overhead powerline for the Twin Hills Gold Project, Erongo Region, Namibia

Client Company Name: Osino Gold Exploration and Mining (Pty) Ltd on behalf of NamPower

Client Name: Mr Charles Creasy

Ministry Reference: APP-001271

Status of Report: Final for public review

Project Number: ECC-103-443-REP-07-C

Date of issue: July 2023

Review Period 3 July 2023 – 17 July 2023

ENVIRONMENTAL COMPLIANCE CONSULTANCY CONTACT DETAILS:

We welcome any enquiries regarding this document and its content. Please contact:



Environmental Compliance Consultancy
PO Box 91193, Klein Windhoek, Namibia
Tel: +264 81 669 7608
Email: info@eccenvironmental.com

DISCLAIMER

The report has been prepared by Environmental Compliance Consultancy (Pty) Ltd (ECC) (Reg. No. 2022/0593) on behalf of the Proponent. Authored by ECC employees with no material interest in the report's outcome, ECC maintains independence from the Proponent and has no financial interest in the Project apart from fair remuneration for professional fees. Payment of fees is not contingent on the report's results or any government decision. ECC members or employees are not, and do not intend to be, employed by the Proponent, nor do they hold any shareholding in the Project. Personal views expressed by the writer may not reflect ECC or its client's views. The environmental report's information is based on the best available data and professional judgment at the time of writing. However, please note that environmental conditions can change rapidly, and the accuracy, completeness, or currency of the information cannot be guaranteed.

TABLE OF CONTENTS

1	Introduction	7
1.1	Company background	7
1.2	Purpose of the report.....	9
1.3	The proponent of the proposed Project.....	9
1.4	Environmental and social assessment practitioner	9
1.5	Environmental requirements	10
2	Approach to the assessment.....	12
2.1	Purpose and scope of the assessment.....	12
2.2	The assessment process	12
2.3	Study area	15
2.4	Public consultation.....	15
2.4.1	Identification of key stakeholders and interested or affected parties	15
2.5	Summary of issues raised.....	18
3	Review of the legal environment	20
3.1	National regulatory framework	21
3.2	Specific permits and licences	27
4	Project description	28
4.1	Company background	28
4.1.1	Osino Gold Exploration and mining	28
4.1.2	Namibia Power Corporation.....	28
4.2	Need for the project	28
4.3	Alternatives considered	28
4.4	Background of the project	29
4.4.1	The proposed powerline routes.....	30
4.5	The 66 kV powerline infrastructure.....	31
4.6	Proposed stages of the project	35
4.6.1	Construction phase.....	35
4.6.2	Operational phase	35
4.6.3	Decommissioning stage	35
4.7	Utilities	36
4.7.1	Water supply.....	36
4.7.2	Workforce accommodation	36
4.7.3	Waste management (solid and effluent waste)	36
5	Environmental and social baseline	37

5.1	Climate.....	37
5.2	Flora and fauna diversity	38
5.3	Reptile and amphibian diversity	39
5.4	Avian diversity.....	39
5.5	Topography, geology and soils	40
5.6	Socio-economic environment	40
6	Impact identification and evaluation methodology	41
6.1	Introduction	41
6.2	Assessment guidance	44
6.3	Limitations, uncertainties and assumptions	44
7	Impact assessment findings and proposed mitigation measures.....	45
7.1	Critical mitigation measures.....	52
7.1.1	Avifauna.....	52
8	Conclusion.....	54

TABLE OF FIGURES

Figure 1 - Locality map of the two proposed overhead powerline routes.....	8
Figure 2 - EIA flowchart.....	14
Figure 3 - The proposed powerline routes and neighbouring farms around ML 238.....	17
Figure 4 - A viewshed map showing areas where the powerline will be visible.....	19
Figure 5 - An example of a metering station	29
Figure 6 - An example of a substation facility system.....	30
Figure 7 - The proposed powerline routes in relation to the existing 22 kV Erongo RED powerline grid.....	32
Figure 8 - General layout of the proposed NamPower and Twin Hills substation.....	33
Figure 9 - NamPower standard 66 kV steel mono pole transmission line pole drawings	34
Figure 10 - Annual expected weather conditions (Meteoblue, 2022)	37
Figure 11 - Average wind directions for the area.....	38
Figure 12 - ECC ESIA methodology based on IFC standards.	43
Figure 13 - Recommended sections of powerline to be marked for the proposed 66kV powerline for the two routes.....	52
Figure 14 - Powerline marking devices: BIRD-FLIGHT Diverters (left) and RAPTOR-CLAMP Diverters (right).....	53

LIST OF TABLES

Table 1 - Proponent's details	9
-------------------------------------	---

Table 2 - Listed activities potentially triggered by the Project.	11
Table 3 - Details of the regulatory framework as it applies to the Project.....	21
Table 4 – Specific permits and licence requirements for the Project	27
Table 5 - Limitations, uncertainties and assumptions	44
Table 6 - Impact assessment findings and proposed mitigation measures	45

LIST OF APPENDICES

Appendix A – Environmental management plan	56
Appendix B – Public consultation document.....	57
Appendix C – Specialist study (Avifauna)	58

ABBREVIATIONS

ABBREVIATION	DEFINITION
%	percent
°C	Degree celcius
BID	background information document
E	east
ECC	Environmental Compliance Consultancy (Pty) Ltd
EIA	environmental impact assessment
EMA	Environmental Management Act No. 7 of 2007
EMP	environmental management plan
ENE	east north-east
Erongo RED	Erongo Regional Electricity Distributor Company (Pty) Ltd
ESIA	environmental and social impact assessment
GDP	gross domestic product
GPS	Global Positioning System
HFO	heavy fuel oil
I&APs	interested and affected parties
IFC	International Finance Corporation
IPPs	Independent Power Producers
km/h	kilometre per hour
km ²	square kilometre
kV	kilovolts
MEFT	Ministry of Environment, Forestry and Tourism
m	metre
m ²	square metre
mm	millimetre
MME	Ministry of Mines and Energy
MAWLR	Ministry of Agriculture, Water and Land Reform
MURD	Ministry of Urban and Rural Development
NamPower	Namibia Power Corporation
OPGW	optical ground wire
PV	photovoltaic
REDs	Regional Electricity Distributors
REFIT	Renewable Energy Feed in Tariff
RoD	Record of Decision
SABAP	Southern African Bird Atlas Project
SAPP	Southern African Power Pool
SOP	standard operation procedure

1 INTRODUCTION

1.1 COMPANY BACKGROUND

Environmental Compliance Consultancy (Pty) Ltd (ECC) has been contracted by Osino Gold Exploration and Mining (Pty) Ltd on behalf of NamPower (the Proponent), to conduct an environmental assessment and develop an environmental management plan (EMP) for the proposed 66 kV powerline Project for the Twin Hills Gold Project. The scoping and the EIA report are compliant with the Environmental Management Act, No. of 7 of 2007 and its 2012 regulations and are aligned with international standards (IFC). An environmental clearance application will be submitted to the relevant competent authorities - the Ministry of Mines and Energy (MME) and The Ministry of Environment, Forestry, and Tourism (MEFT) for a record of decision (RoD).

Twin Hill Gold Project is located on farm Okawayo, 15 km east (E) of the D1941 and C33 intersection, in the Erongo Region. The proposed 66 kV overhead powerline will be constructed from the NamPower Erongo substation to the Twin Hills Gold Project. The NamPower Erongo substation is a new development master plan that falls within NamPower's transmission objectives. Two powerline routes are proposed, with the preferred route covering a length of about 20.3 km whilst the alternative route covers about 24.6 km (Figure 1).

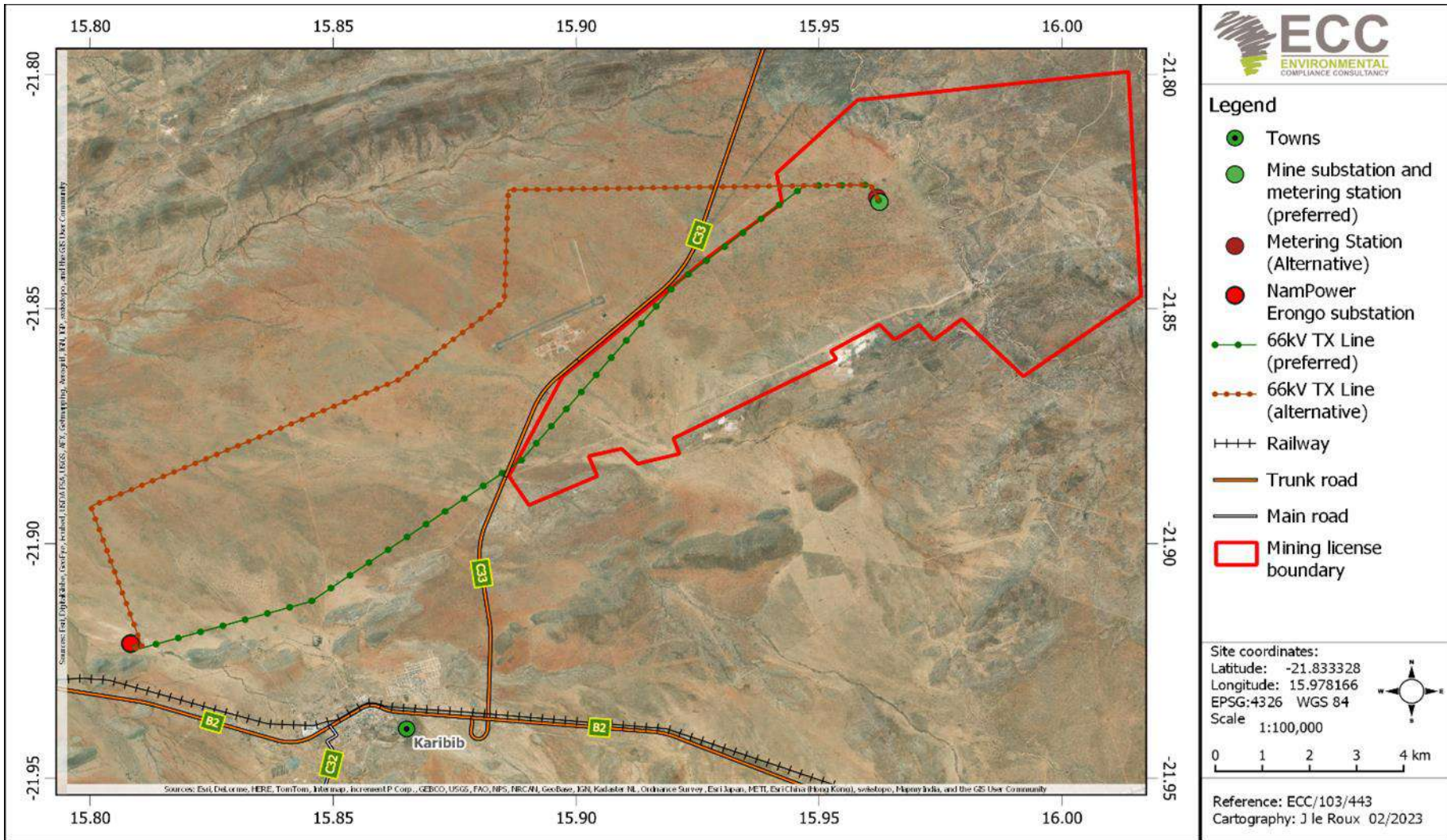


Figure 1 - Locality map of the two proposed overhead powerline routes

1.2 PURPOSE OF THE REPORT

An environmental impact assessment (EIA) is being conducted in fulfillment of the EMA and its regulations of 2012. The purpose of this report is to present the findings of the scoping study phase that forms part of the larger ESIA process. This scoping report summarises the prescribed EIA process followed; provides information on the baseline biophysical and socioeconomic environments, project description, and details; outlines the terms of reference for the assessment phase; and presents an environmental management plan (EMP), which is provided as Appendix A.

The scoping report and appendices will be submitted to the public for review. This stage provides an opportunity for interested and affected parties (I&APs) to provide input, comments, and suggestions on the proposed project, and in so doing, guide the impact assessment phase. The scoping report, inclusive of the public comments, will then be submitted to the Ministry of Mines and Energy (MME) as the competent authority for the project. Thereafter, it will be submitted to the Ministry of Environment, Forestry, and Tourism (MEFT) - Directorate of Environmental Affairs (DEA) for a record of decision.

1.3 THE PROPONENT OF THE PROPOSED PROJECT

Table 1 below provides the Proponent's details.

Table 1 - Proponent's details

Company Representative	Contact Details
Mr. Charles Creasy	P.O. Box 3489, Windhoek, Namibia ccreasy@osinoresources.com +26481 762 2209

1.4 ENVIRONMENTAL AND SOCIAL ASSESSMENT PRACTITIONER

Environmental Compliance Consultancy (Pty) Ltd (ECC) (Reg. No. CC 2022/0593) has prepared this report and the EMP on behalf of the Proponent.

This report has been authored by ECC employees with no material interest in the report's outcome, ECC maintains independence from the Proponent and has no financial interest in the Project apart from fair remuneration for professional fees. Payment of fees is not contingent on the report's results or any government decision. ECC members or employees are not, and do not intend to be, employed by the Proponent, nor do they hold any shareholding in the Project. Personal views expressed by the writer may not reflect ECC or its client's views. The environmental report's information is based on the best available data and professional judgment at the time of writing. However, please note that environmental conditions can change rapidly, and the accuracy, completeness, or currency of the information cannot be guaranteed.

All compliance and regulatory requirements regarding this report should be forwarded by email or posted to the following address:

Environmental Compliance Consultancy
PO Box 91193, Klein Windhoek, Namibia
Tel: +264 81 669 7608
Email: info@eccenvironmental.com

1.5 ENVIRONMENTAL REQUIREMENTS

The Environmental Management Act, 2007, and its regulations stipulate that an environmental clearance certificate is required before undertaking any of the listed activities that are identified in the Act and its regulations. Potential listed activities triggered by the project are provided in Table 2.

Table 2 - Listed activities potentially triggered by the Project.

Listed Activity	Relevance To the Project
<p>Energy generation, transmission and Storage activities The construction of facilities for:</p> <p>(1a) The generation of electricity</p> <p>(1b) The transmission and supply of electricity</p>	<ul style="list-style-type: none"> - A 66 kV mono steel overhead powerline grid will be constructed to supply power to the Twin Hills Gold Project. - A 66 kV metering station (to be owned by NamPower) will be constructed adjacent to the Twin Hills substation.
<p>Waste management, treatment, handling And disposal activities (2.1) The construction of facilities for waste sites, treatment of waste and disposal of waste.</p> <p>(2.3) The import, processing, use and recycling, temporary storage, transit or export of waste.</p>	<ul style="list-style-type: none"> - Chemical toilets for on- site workforce will be constructed during the construction and operational phase of the Project. - Waste generated during the construction phase will be removed by a skip and will be disposed of at the nearest landfill site.
<p>Forestry activities (4.) The clearance of forest areas, deforestation, afforestation, timber harvesting or any other related activity that requires authorisation in term of the Forest Act, 2001 (Act No. 12 of 2001) or any other law</p>	<ul style="list-style-type: none"> - During the construction phase, vegetation will be cleared be cleared to create access tracks and servitude of the powerline. - Land/ vegetation will be cleared for the Twin Hills substation and the NamPower metering station. The perimeter of these infrastructure will be cleared and enclosed by a security fence.
<p>Infrastructure 10.1 The construction of:</p> <p>(j) masts of any material or type, and of any height, including those used for telecommunication broadcasting and radio transmission.</p>	<ul style="list-style-type: none"> - A 66 kV mono steel powerline grid will be constructed from the NamPower Erongo substation to the proposed Twin Hills Gold Project.

2 APPROACH TO THE ASSESSMENT

2.1 PURPOSE AND SCOPE OF THE ASSESSMENT

The purpose of this assessment is to determine which impacts are likely to be significant; to scope the available data and identify any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.

2.2 THE ASSESSMENT PROCESS

The EIA methodology applied to this assessment has been developed using the International Finance Corporation (IFC) standards and models, in particular, Performance Standard 1: 'Assessment and management of environmental and social risks and impacts (International Finance Corporation, 2012 and 2017); Namibian legislation and Draft Procedures and Guidance for EIA and EMP (the Republic of Namibia, 2008); international and national best practice guidelines; and ECC's combined relevant ESIA experience.

This assessment is a formal process. The potential impacts of the Project on the biophysical and economic environments are identified, assessed, and publicly reported for consideration by authorities for their record of decision for the proposed Project.

Final mitigation measures and recommendations are based on the cumulative experience of the consulting team and the Proponent, taking into consideration the potential environmental impacts. The process followed, through the assessment, is illustrated in Figure 2, and is detailed further in the following sections.

It is important to note the assessment has been carried out in accordance with the plans received from the proponent. After completing the assessment, some aspects of the proponent's plans may need to change in order to comply with the mitigations.

1. Project screening	2. Establishing the assessment scope	3. Baseline studies
Complete	Complete	Complete
<p>The first stages in the ESIA process are to undertake a screening exercise to determine whether the Project triggers listed activities under the Environmental Management Act, 2007, and its regulations. The screening phase of the Project is a preliminary analysis, in order to determine ways in which the Project might interact with the biophysical, social, and economic environments.</p> <p>Stakeholder engagement:</p> <ul style="list-style-type: none"> • Registration of the project • Preparation of the BID 	<p>Where an ESIA is required, the second stage is to scope the assessment. The main aim of this stage is to determine which impacts are likely to be significant; to scope the available data and any gaps that need to be filled; to determine the spatial and temporal scope; and to identify the assessment methodology.</p> <p>The scope of this assessment was determined through undertaking a preliminary assessment of the proposed Project against the receiving environment. Feedback from consultation with the public and the Proponent informs this process. The following environmental and social topics were scoped into the assessment, as there was the potential for significant impacts to occur. Impacts that are identified as potentially significant during the screening and scoping phase are taken forward for further assessment in the ESIA process. These are:</p> <p>SOCIOECONOMIC ENVIRONMENT</p> <ul style="list-style-type: none"> • Employment • Visual impacts • Community health, safety and security (on-site) <p>BIOPHYSICAL ENVIRONMENT</p> <ul style="list-style-type: none"> • Avifauna • Biodiversity; <ul style="list-style-type: none"> • Fauna • Flora <p>The following topics were scoped out of the ESIA, and they are therefore not discussed further in this report.</p> <ul style="list-style-type: none"> • An assessment of safety impacts or risks associated with developing the project are not included within the scope of this assessment and will be addressed by the Proponent in a specific safety management plan. 	<p>A robust baseline is required, in order to provide a reference point against which any future changes associated with a Project can be assessed, and to allow suitable mitigation and monitoring to be identified.</p> <p>The region and general area have been studied for various projects and assessments. This literature was available to be referenced. The Project site-specific area has been studied as part of the ESIA process, and the following has been conducted as part of this assessment:</p> <ul style="list-style-type: none"> • Desktop studies • Consultation with stakeholders • Specialist studies <p>The environmental and social baselines are provided in the scoping study.</p>

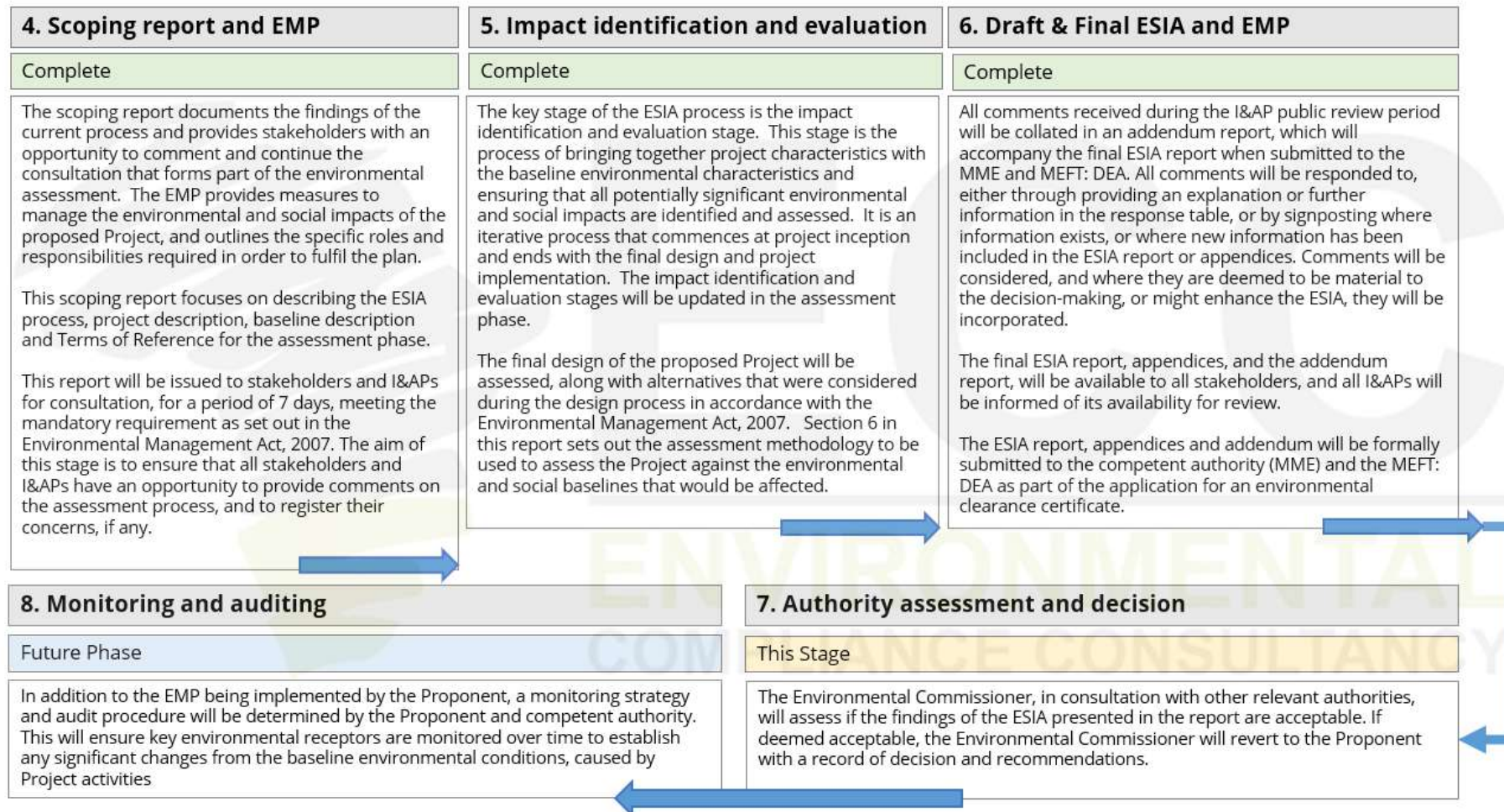


Figure 2 - EIA flowchart

2.3 STUDY AREA

This EIA study area includes two powerline routes and a NamPower substation as seen in Figure 1. The receiving environment is a summary term for the biophysical and socioeconomic environment that is described in the baseline chapter.

2.4 PUBLIC CONSULTATION

Public participation and consultation are a requirement stipulated in Section 21 of the Environmental Management Act, 2007, and its regulations, for a project that requires an environmental clearance certificate. Consultation is a compulsory and critical component of the EIA process for achieving transparent and inclusive decision-making and can provide many benefits. Consultation continues throughout the EIA process.

The objectives of the public participation and consultation process are to:

- Provide information on the project, and introduce the overall project concept and plan in the form of a background information document (BID);
- Identify the relevant government, regional, and local regulating authorities;
- Engage with community, NGO, and tourism-related issues, record questions and concerns, and integrate the issues and aspects in the process;
- Explain the process of the EIA and the timeframes involved; and
- Establish a platform for ongoing consultation.

Public consultation for the Project commenced on the 12th of April 2023, and the site notice was erected on site on same day. The Adverts were published in the newspaper announcing the dates of the public meetings and encouraging members of the public to sign up as an I&AP for the Project.

The adverts for the public meeting were published in newspapers and the notification of the assessment in terms Regulation 21 of the Act was placed in the following newspapers on the 13th of April 2023 and 17th of April 2023:

- The Republikein;
- The Namibian Sun; and
- Allgemeine Zeitung.

The public meeting was held at the Karibib Town Council community hall on the 20th of April 2023.

2.4.1 IDENTIFICATION OF KEY STAKEHOLDERS AND INTERESTED OR AFFECTED PARTIES

A stakeholder mapping exercise was undertaken to identify individuals or groups of stakeholders and the method in which they will be engaged during the EIA process. Stakeholders were approached through direct communication (letters and phone calls), the national press, site

notices and directly by email. The list of stakeholders and a summary of their input is included in Appendix B. Figure 3 shows farms around the Twin Hills Project mining licence (ML 238).

A summarised list of stakeholders that were engaged during the public consultation process is given below:

- The general public with an interest in the project;
- Directly and indirectly affected landholders;
- Karibib Town Council;
- Erongo Regional Council;
- Omaruru Town Council;
- Karibib Air Force Base;
- Erongo RED;
- QKR Navachab Gold Mine;
- Electricity Control Board;
- Namibia Civil Aviation Authority;
- Road Authority;
- The National Heritage Council;
- Town residents and business owners; and
- Relevant line Ministries (MEFT, MAWLR, MURD and MME).

The records of the public consultation process in the form of a summary report are provided in **Error! Reference source not found.** and provides the current list of I&APs, evidence of consultation, including minutes of the public meeting, advertisements in national newspapers, and a summary of the comments or questions raised by the public. A summary of the key concerns raised during the consultation process is provided in section 2.5.

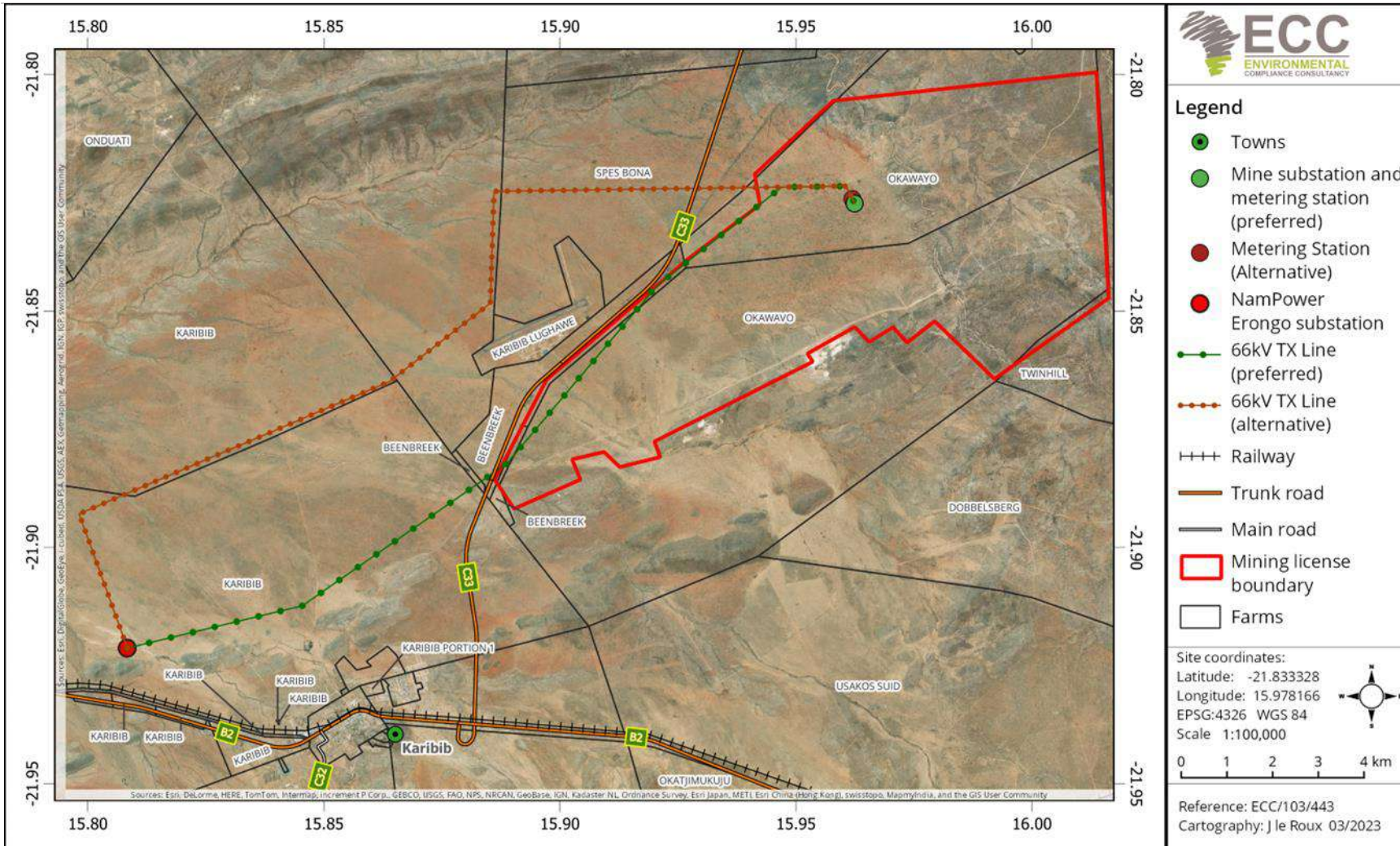


Figure 3 - The proposed powerline routes and neighbouring farms around ML 238

2.5 SUMMARY OF ISSUES RAISED

Major concerns were raised by registered I&APs on the alternative powerline route as it is within close nautical miles from the Karibib Air Force Base. There were no objections to the preferred powerline route.

Below are the concerns raised by stakeholders (I&APs) at the public meeting and via e-mail:

- Visual impacts;
- Community benefits from the Project, e.g. job opportunities;
- Level of Project information decentralisation; and
- Technicality of the BID.

Below in Figure 4 is a viewshed map to address the visual impact concerns by stakeholders (I&APs). The Karibib Air Force Base is within the range that is up to 2.5 km, which may indicate a possible visual impact.

To ensure that interested and affected parties can comment further on the scoping and impact assessment report, this report is circulated with potentially interested and affected parties and stakeholders for a 7-day review period. Should stakeholders have comments or questions, or areas that concern them that they feel require further assessment, ECC will address these in the assessment phase or through an addendum report to the final scoping report document.

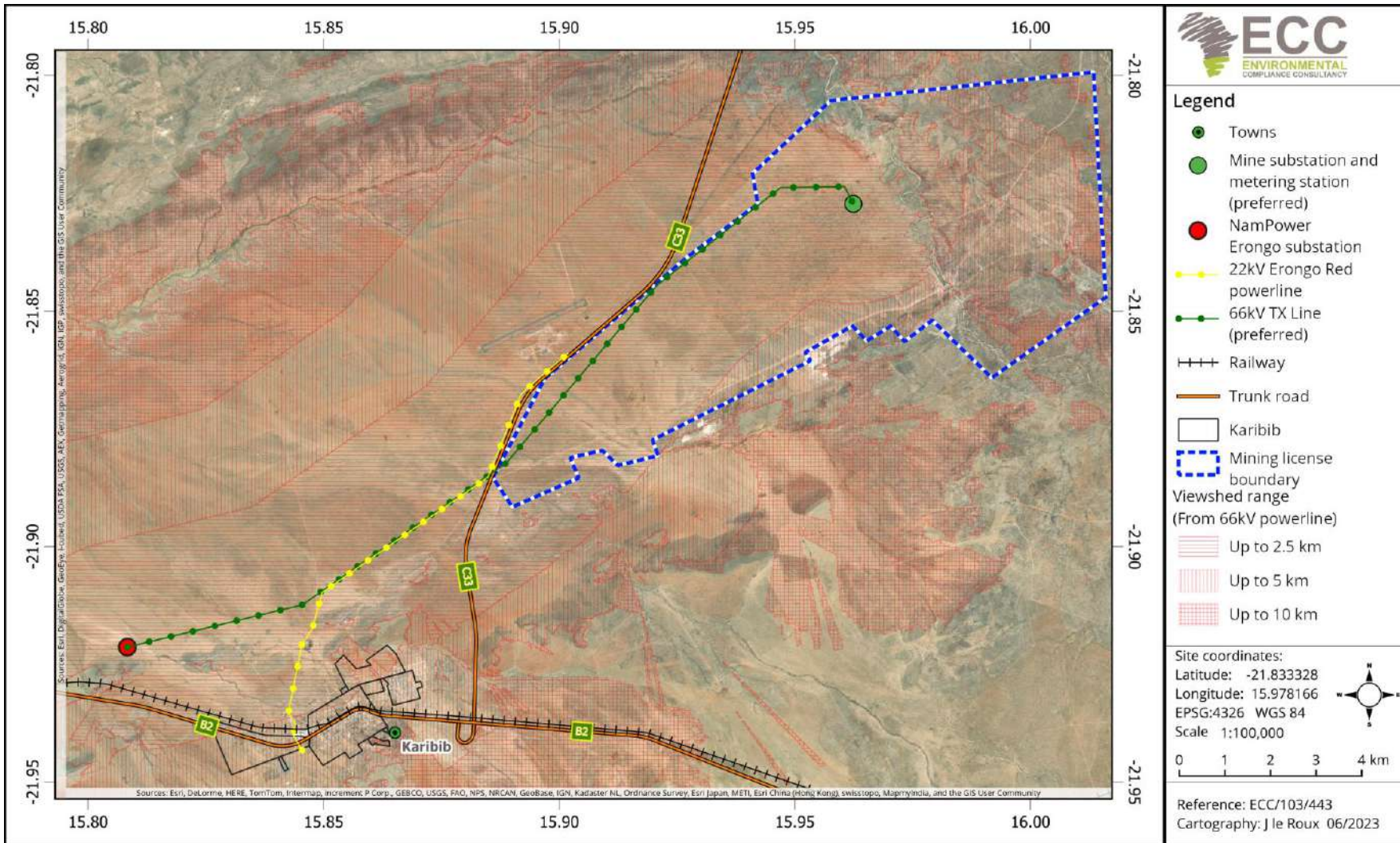


Figure 4 - A viewshed map showing areas where the powerline will be visible

3 REVIEW OF THE LEGAL ENVIRONMENT

This chapter outlines the regulatory framework applicable to the proposed Project. Therefore, a thorough review of relevant legislation relevant to the Project was conducted. Table 3 identifies relevant legal requirements specific to the Project. **Error! Reference source not found.** provides the national policies and plans.

Table 4 contains specific permits relevant to the Project. **Error! Reference source not found.** refers to international policies and plans relevant to the Project.

3.1 NATIONAL REGULATORY FRAMEWORK

Table 3 - Details of the regulatory framework as it applies to the Project.

National Regulatory Regime	Summary	Applicability to the project
Constitution of the Republic of Namibia (1990)	<p>The Constitution of the Republic of Namibia, 1990 clearly defines the country's position concerning sustainable development and environmental management. Article 95 of the constitution refers that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at the following:</p> <p><i>"Maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for the benefit of all Namibians, both present, and future; in particular, the government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian territory."</i></p>	The Proponent is committed to the sustainable use of the environment and has aligned its corporate mission, vision, and objectives with the Constitution of the Republic of Namibia (1990).
Environmental Management Act, (No. 7 of 2007) and its regulations, including the Environmental Impact Assessment Regulation, 2007 (No. 30 of 2012)	<p>The Act aims to promote sustainable management of the environment and the use of natural resources by establishing principles for decision-making on matters affecting the environment.</p> <p>The Act requires certain activities to obtain an environmental clearance certificate prior to project development. The Act states that an EIA may be undertaken and submitted for as</p>	<p>The proposed Project is a listed activity and thus triggers the need for environmental assessments before commencement.</p> <p>The Environmental scoping and impact assessment report documents the findings of the environmental assessment undertaken for the proposed Project, which will form part of the environmental clearance application.</p>

National Regulatory Regime	Summary	Applicability to the project
	<p>record of decision as part of the environmental clearance certificate application.</p> <p>The MEFT is responsible for the protection and management of Namibia's natural environment. The Department of Environmental Affairs under the MEFT is</p>	<p>The EIA process has been undertaken in line with the requirements under the Act and associated regulations of 2012.</p>
<p>Electricity Act No. 4 of 2007 & its Regulations</p>	<p>The Act aims to provide authority to the Electricity Control Board and the Control Board Committee in the control of licensees, setting obligations of licensees and provide for incidental matters.</p>	<p>The Project will supply electricity for the proposed Twin Hills Gold Mine. The Proponent recognises the power vested into the Electricity Control Board committee and conditions required for the application of the necessary licences. The Proponent will ensure that all requirements from the Electricity Control Board are adhered to.</p>
<p>Namibia Energy Regulatory Authority Bill and Electricity Bill of 2019</p>	<p>In terms of the Electricity Act No. 4 of 2007, the bill aims to establish a single national energy regulator (Namibia Energy Regulatory Authority) which regulate the energy sectors and provide for incidental matters.</p> <p>The Electricity Bill made provision for the establishment of the national regulatory framework for the electricity provision industry; to establish a licensing system for the generation, transmission, distribution, supply, trading, import and export of electricity; to provide for the powers and obligations of licensees; to regulate tariffs; and to provide for incidental matters.</p>	<p>The Proponent recognise the duties of the Authority Council as a regulatory body in the energy sector, the duly penalties for non-compliances and thus commit to adhere to the mandate and framework of the Electricity Act.</p> <p>The Project will require certain permits for the transmission and supply of power for the proposed Project.</p>

National Regulatory Regime	Summary	Applicability to the project
National Energy Policy of 2017	The policy promotes the development of local generation capacity to improve security of supply through appropriate planning at national level, reviewing the present electricity market model, on-going viability and development of the transmission and distribution networks, strengthening the regulatory framework, and shaping the electricity mix of the future.	The Project promotes multi transmission and supply of power through power distribution (since the Karibib substation will also be feed by the Erongo NamPower substation). This improves the electricity market model.
Civil Aviation Act, No. 6 of 2016 and the Namibia Civil Aviation Regulations of 2001	The Act and its regulations relate to technical standards and security protocols for safe aircrafts navigation in Namibia's airspace.	Relevance to the Project, the proposed powerline routes are within 5 nautical miles of an aerodrome (Karibib Airforce Base). The proponent recognises the Karibib Airforce Base as an affected party at the project screening phase. Through consultation with the Executive Directors office, the Proponent will have to obtain written consent for land use and erection of permanent obstacles in an aerodrome.
Namibia Civil Aviation Regulations and Namibia Civil Aviation Technical Standards Subpart 139.01.34, 139.11 and 139.13 of the Government Notice No. 55 of 2023	Section 139.01.34 of the technical standard points out the aerodrome operator's obligations in protecting safeguarding aerodromes to limit illegal occupations that could potentially impact aircraft safety and future aerodrome expansion. Section 139.11 narrates the height restrictions for the erection of obstacles within an aerodrome which could prevent aircraft operations from being conducted safely.	The proposed powerline routes are within 5 nautical miles of an aerodrome. The standards make provision for the Proponent to engage with the office of the Executive Director prior to any constructions works within an aerodrome. The Proponent will further have to consult the office of the Executive Director in terms of the obstacle limitation surface of the aerodrome and further agree upon with the Executive Director on the permitted

National Regulatory Regime	Summary	Applicability to the project
	<p>Written consent from the Executive Director will be required prior to erection of any obstacle within an aerodrome.</p> <p>Section 139.13 narrates the visual requirements for any objects to be erected within the lateral boundaries of the obstacle limitation surfaces</p>	<p>height of the structures to be erected and visual aid denotation of such objects.</p>
<p>Soil Conservation Act, No. 76 of 1969</p>	<p>This Act makes provision for the prevention and control of soil erosion, and for the protection, improvement, and conservation of soil and vegetation.</p>	<p>Disturbance of the soil is anticipated as the land will be cleared to create access tracks and portions cleared for the NamPower metering station and Twin Hills substation. This could constitute a risk for soil erosion.</p>
<p>The Forestry Act, No. 12 of 2001 as amended by the Forest Amendment Act, No. 13 of 2005</p>	<p>Section 22 and 23 discusses the requirements and protection of vegetation in natural areas. A permit for the cutting, destruction or removal of vegetation that are classified under rare and or protected species; clearing the vegetation on more than 15 hectares on any piece of land or several pieces of land situated in the same locality which has predominantly woody vegetation or cut or remove more than 500 cubic metres of forest produce from any piece of land in a period of one year.</p>	<p>A total of 5550 m² of land will be cleared for the substation and metering station. Moreover, the demarcation of the powerline servitude will result in the removal of vegetation. Should there be protected tree species in the area, a harvest permit will have to be applied for through the Ministry of Environment, Forestry and Tourism (MEFT) prior to the removal of such species. The application should satisfy that the cutting and removal of such vegetations will not interfere with the conservation of soil, water or forest resources.</p>
<p>National Heritage Act, No. 27 of 2004.</p>	<p>The Act provides provision for the protection and conservation of sites and objects with heritage significance.</p>	<p>There might be potential to unearth heritage objects with heritage importance on-site, therefore the specifications of the Act have been taken into</p>

National Regulatory Regime	Summary	Applicability to the project
		consideration and are incorporated into the EMP. The chance find procedure must prevail in the event of identifying potential heritage sites.
Nature Conservation Ordinance Act No. 4 of 1975 and its regulations.	“The Act makes provision for the conservation and management of wildlife and regulates fishing in inland waters, regulate laws relating to the establishment of game parks and nature reserves, control problem animals and provide for incidental matters.	Land will be cleared for the proposed development, hence there is a potential of habitant destruction and habitant fragmentation. The magnitude of such impacts and associated cumulative impacts are discussed in chapter 7 of this report.
Labour Act, No. 11 of 2007: Regulations relating to the Health and Safety of Employees at Work (GN 156/1997).	The Act provides for the regulation of employees’ health and safety in the workplace.	This Act recognises the safety and welfare of workers. As per the EMP, the Proponent will be responsible for implementing a health and safety management plan.
The Regional Councils Act (No. 22 of 1992)	<p>The Act sets out 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.</p> <p>The main objective of this Act is to initiate, supervise, manage, and evaluate development.</p>	The Proponent recognises the power vested in the Erongo Regional Councils, Town Planners and Environmental, Health and Safety Officers as key stakeholder who should be engaged with throughout all phases of the environmental impact assessment (EIA) process.

3.2 SPECIFIC PERMITS AND LICENCES

Table 4 – Specific permits and licence requirements for the Project

Permit, licence or registration	Act or Regulation	Relevant authority	Related activities requiring a permit
Permit for the removal of vegetation	The Forest Act, 2001 (Act No. 12 of 2001)	Ministry of Environment, Forestry and Tourism	Permit will be required for the clearing of any protected vegetation for the creation of access tracks and demarcation of the powerline servitude, the NamPower metering station and Twin Hills substation.
Wastewater discharge permit	A permit is issued under the Water Act, No. 54 Of 1956 (enforced) but form types that fall under the Water Act, No. 24 of 2004 are used.	Ministry of Agriculture, Water and Land Reform	Wastewater discharge permit will need to be applied for.
Transmission and supply licence	Electricity Act No.4 of 2007	Electricity Control Board	The Project is classified as high voltage (voltage capacity exceeding 44 000 volts). The Proponent will need to apply for the transmission licence and supply licence.

4 PROJECT DESCRIPTION

4.1 COMPANY BACKGROUND

4.1.1 OSINO GOLD EXPLORATION AND MINING

The Proponent, Osino Gold Exploration and Mining (Pty) Ltd is a Namibian company and subsidiary of Osino Resources Corporation. Osino Resources Corporation manages operations in Namibia through its wholly owned subsidiary, Osino Namibia Holdings (Pty) Ltd.

The Proponent has a focus on the acquisition and development of potential gold projects in Namibia through extensive exploration programmes. The advanced and successful exploration programme near Karibib has resulted in the development of the Twin Hills Gold Project. The proposed Project is within the Damara mineral belt and a conventional open pit mine is envisioned with a gold extraction process similar to existing gold mines in Namibia, for example the Otjikoto and Navachab Gold Mines.

4.1.2 NAMIBIA POWER CORPORATION

NamPower is an energy generation, transmission and energy trading company within the Southern African Power Pool (SAPP). NamPower is a government enterprise and fulfils the role of single buyer of electricity under the Interim Renewable Energy Feed in Tarriff (REFIT) programme as well as Independent Power Producers (IPPs) i.e. Regional Electricity Distributors, mines, farms and local authorities throughout Namibia.

4.2 NEED FOR THE PROJECT

An environmental clearance certificate was granted for the Twin Hills Gold Project in November 2022. As a result, the Project requires electricity to operate. The proposed 66 kV overhead powerline will meet the expected initial energy demand for the mine.

4.3 ALTERNATIVES CONSIDERED

Best practice environmental assessment methodology calls for consideration and assessment of alternatives to the Project. In terms of the Environmental Management Act, No. 7 of 2007 and its regulations, alternatives considered should be analysed. This requirement ensures that during the design evolution and decision-making process, potential environmental impacts, costs, and technical feasibility have been considered, which leads to the best option(s) being identified.

Alternative power supply such as onsite HFO or diesel-based load power stations connection and diesel generators may be less cost-effective. A PV plant is considered as a renewable source and will be implemented to compliment the NamPower grid connection.

4.4 BACKGROUND OF THE PROJECT

The proposed 66 kV overhead transmission power line will be constructed from the Erongo substation (west of Twin Hills Gold) and will be constructed based on NamPower's standards. Two powerline routes are proposed, with the preferred route covering a length of approximately 20.3 km and the alternative route is approximately 24.6 km (the alternative route is 4 km longer). A new 11 kV distribution line is planned for the Twin Hills Mine (subject of a separate assessment). NamPower is in the planning phase of developing and constructing the Erongo substation. A 66 kV metering station will be constructed on ML 238, along with a substation to be owned by Osino. The site for the metering station and substation have been pre-determined. The Twin Hills Gold Project substation will cover an area of approximately 5000 m² whilst the 66 kV NamPower metering station will approximately cover an area of about 550 m².

An example of the metering station and substation facility system similar to what has been proposed are provided in Figure 5 and Figure 6 respectively.



Figure 5 - An example of a metering station



Figure 6 - An example of a substation facility system

The transmission powerline grid and the NamPower metering station will be constructed according to NamPower standards and will be handed over to NamPower once completed. The existing 220 kV powerlines, 66 kV powerline and the 22 kV Erongo RED powerline will remain and the servitude between the two lines will be based on NamPower standards.

4.4.1 THE PROPOSED POWERLINE ROUTES

Two powerline routes have been proposed:

Route 1: This is the preferred route and is approximately 20.3 km at length. The route is approximately 2 km east of the Karibib Air Force Base. This route is shorter thus less expensive and only crosses one farm (Karibib farm) that is not owned by Osino. The route runs parallel to the 22 kV Erongo RED powerline and transects the 22 kV Erongo Red powerline grid near the C33 Karibib- Omaruru national road (Figure 7). The powerline route will cross over the C33 road near the D1941 district road T- junction.

Route 2: This is the second preferred route and is approximately 24.6 km at length. This route (4) is northwest of the Karibib Air Force Base. Alternative route (No. 2) would run in parallel, close to the existing 66 kV Omburu-Marble power line, for 3.5 km in the western part of the servitude.

Existing transmission powerlines in the area: There are 220 kV and 66 kV powerlines in the area.

-
- 220 kV – Omaruru- New Khan 1 and Omaruru- New Khan 2.
 - 66 kV – Khan-Marble, Marble- Navachab, Marble- Karibib and Omaruru Marble.

4.5 THE 66 kV POWERLINE INFRASTRUCTURE

The 66 kV steel mono pole line will be constructed based on NamPower’s standards. The general site layout plan of the NamPower metering station and the proposed Twin Hills Gold Mine substation is provided in Figure 7 and Figure 8 respectively.

The main technical specifications are as follows:

- The steel mono pole will be constructed at a servitude of 22 meters (11 meters on either side of the powerline centreline) (Figure 9);
- Structure pole length is 20.6 meters and will be planted 2 meters into the ground, hence structure height will be 18.6 meters above ground;
- There will an average span length of approximately 300 meters between poles;
- On the straight sections of the line, intermediate poles will be used that are self-supporting, with no stay wires. Three conductors are suspended above one another in delta configuration, each resting on an insulator;
- Bend poles (a 20 m pole length planted 2 m into the ground) with seven backstays will be used at points where the line changes direction;
- The steel pole is permanently earthed. An optical ground wire (OPGW) will be attached near the top of the pole, 2.2 m (2,200 mm) above the conductors, to increase the reliability of the power supply. The cable closest to the top of the pole, namely the OPGW, will also serve as an earth;
- A steel bar will be placed at the top of the pole structure, i.e. 2.2 m above the highest conductor, to serve as a perch (as a mitigation for electrocutions) and thereby attract birds to safer areas of the structure; and
- 600 mm diameter aircraft warning spheres will be used.

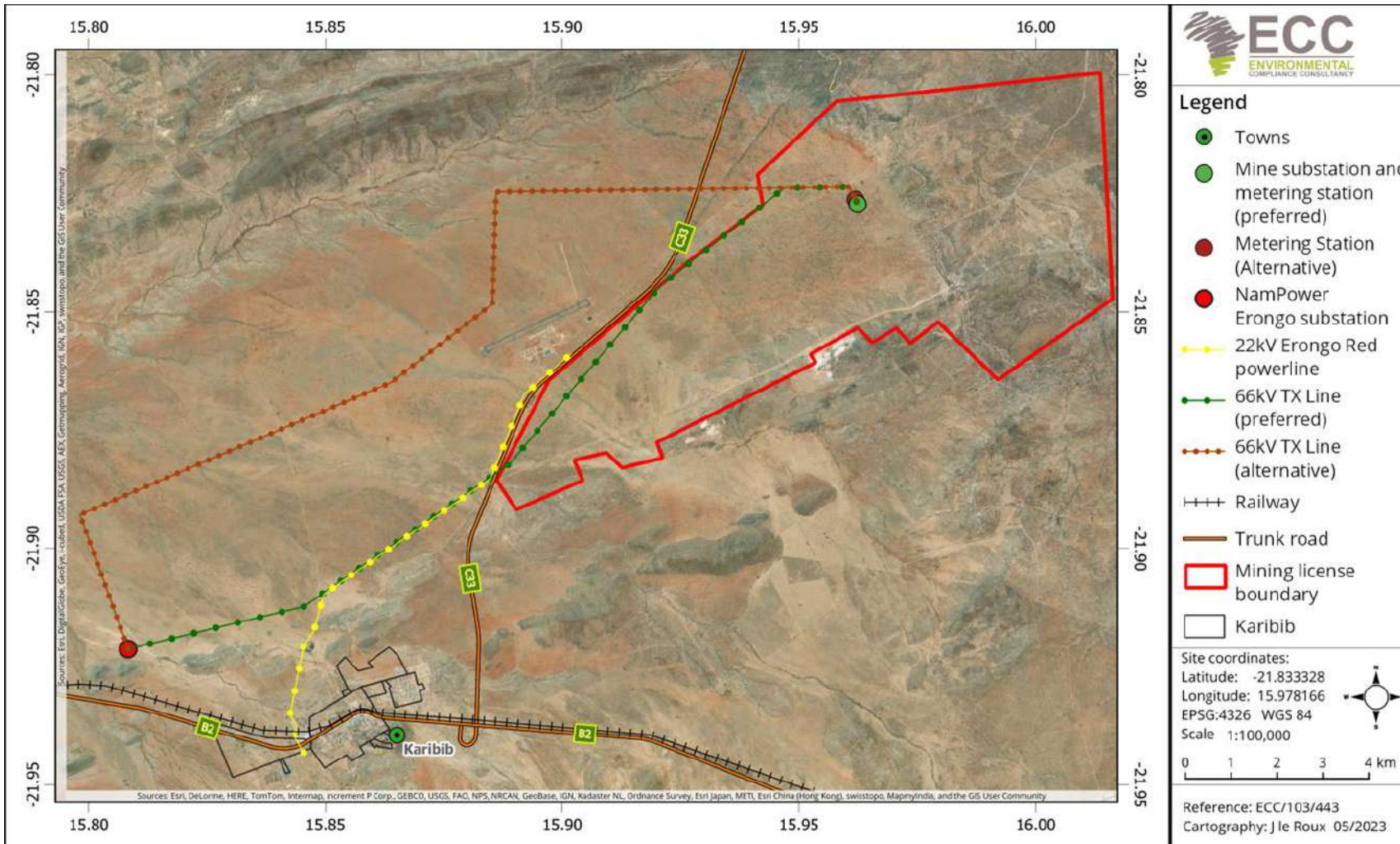
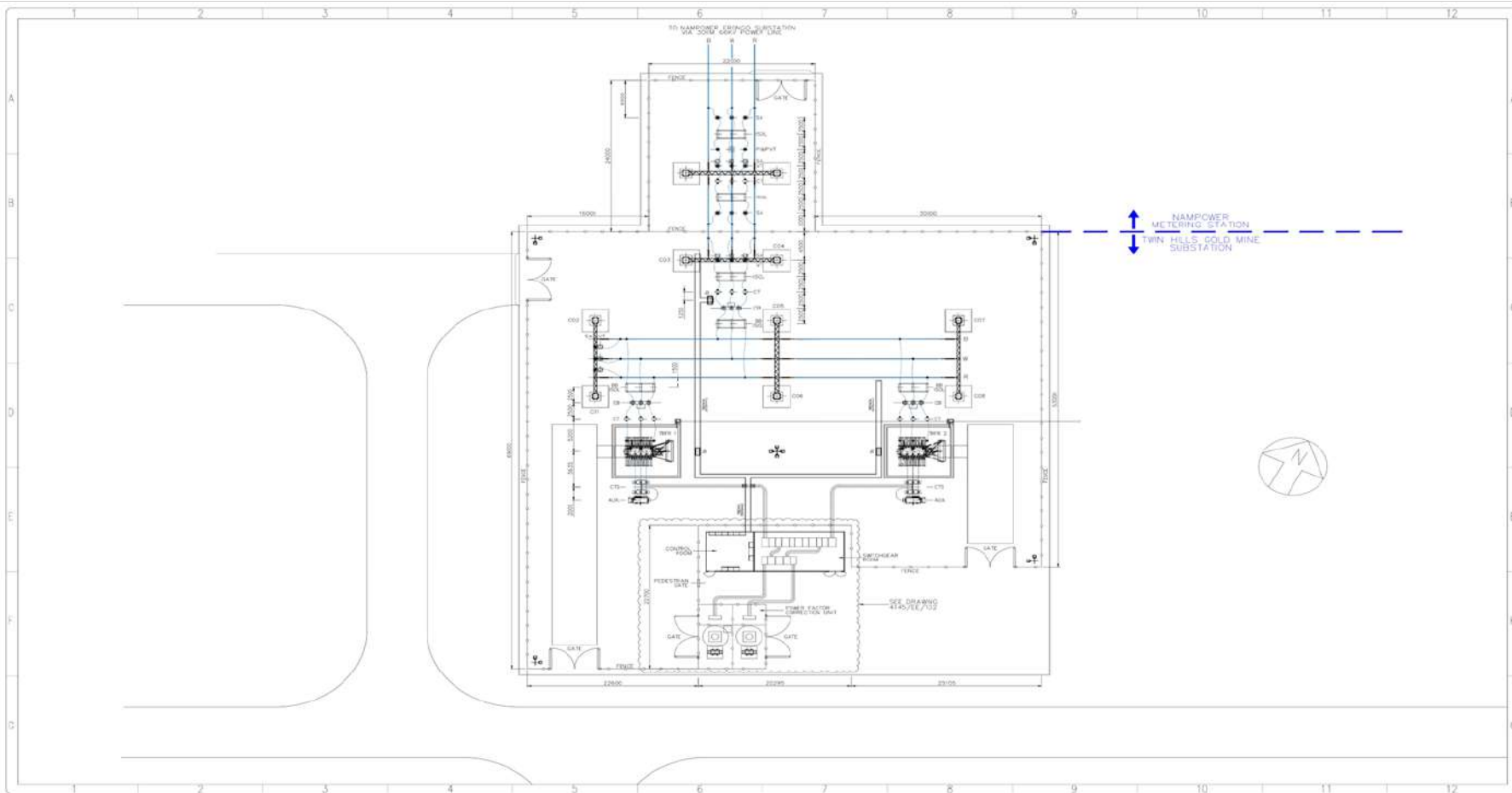


Figure 7 - The proposed powerline routes in relation to the existing 22 kV Erongo RED powerline grid



FOR INFORMATION			
No	Date	Revision	Initial
A	06/12/2022	CONCEPT FOR INFORMATION	FDW

CONSULTANT:



G.S. FAININGER & ASSOCIATES
 CONSULTING ENGINEERS

P.O. BOX 2142
 12 BOMARCE STREET
 WINDHOEK
 NAMIBIA

TEL: +26461 235 165
 FAX: +26461 235 166
 E-MAIL: gfa@gfa.com.na

CLIENT:

OSINO
 RESOURCES

11 FLOU STREET
 P.O. BOX 349
 WINDHOEK
 NAMIBIA

PHONE: +264 (0) 746 533
 CELL: +264 (0) 90 209
 www.osinoresources.com

Approved for : TWIN HILLS GOLD MINE

Drawn: HWZ Checked: FDW
 Approval Date:/..../.....

Project: **TWIN HILLS GOLD MINE**

Drawing Title: **TWIN HILLS 66/11kV SUBSTATION AND NAMPOWER METERING STATION GENERAL ARRANGEMENT LAYOUT**

Date of Issue: 24/11/2021

Scale: NTS

Drawing No: 4140/EE/102_OSINO GOLD MINE TWIN HILLS_GA

Revision: A

Copyright of this drawing reserved

Figure 8 - General layout of the proposed NamPower and Twin Hills substation

4.6 PROPOSED STAGES OF THE PROJECT

4.6.1 CONSTRUCTION PHASE

The following activities are envisioned during the construction phase:

- Vegetation removal to construct the powerline servitude and access tracks;
- Connection to the substation
- Installation of the prefabricated standard components
- Minor ground preparation of the site for the installation of steel poles

The construction of the powerline will create approximately 10 to 20 jobs, with majority of employment reserved for local Namibians in line with NamPower recruitment policy. The powerline construction and substation construction works will be assigned to local Namibian Specialist contractors.

Delivery of construction machineries will be required, but no abnormal loads are expected. The equipment required during the construction phase are: earth moving equipment, compactor, rollers transport vehicles, cranes and lifting equipment, concrete batching plant and cement trucks, hand tools and workers machineries, LDV vehicles, site office and containers. A site storage facility and laydown area for construction equipment will also be required. During the construction phase, 500 kVA construction power will be required and will be sourced from Erongo RED.

4.6.2 OPERATIONAL PHASE

During normal operation, the powerline infrastructure requires little intervention. Periodic inspections and servitude management will be required. The powerline and substation will require monthly inspections, or else as per NamPower schedule. This means 2-5 workers will be required for this works.

Management, malfunction handling and maintenance of the powerline and associated infrastructure will ensure the longevity of the infrastructure, hence securing potential for future use.

4.6.3 DECOMMISSIONING STAGE

The EMP developed for the proposed Project sets out auditable management and rehabilitation actions for the Proponent to ensure careful and sustainable management measures are implemented. The proponent will have to implement rehabilitation measures at the Project decommissioning stage as outlined in the EMP.

4.7 UTILITIES

4.7.1 WATER SUPPLY

Water required for concrete batching during the construction phase will be sourced from the Twin Hills Gold Mine site.

4.7.2 WORKFORCE ACCOMMODATION

Local employed community members will reside at their homes and will be transported to site daily. Local employees sourced from elsewhere will be housed at a contractor's camp during the construction phase of the Project. The contractor's camp location will be based on agreement between Osino, the landowners NamPower or arrangements can be made for contractors to make use of the canteen camp at Twin Hills which already have ablution facilities.

4.7.3 WASTE MANAGEMENT (SOLID AND EFFLUENT WASTE)

The Project will not create wastewater effluent streams. General waste generated during the construction phase will be removed by a skip and disposed of at the waste disposal site works in Karibib.

5 ENVIRONMENTAL AND SOCIAL BASELINE

This section provides an overview of the existing biophysical, social and economic environments through the analysis of the available baseline data of and on the receiving environments. Desktop studies and specialist studies forms part of the scoping process to obtain information about the status of the receiving environment. This provides a baseline, so that where changes occur because of the proposed Project, the impact of these changes can be measured and assessed.

5.1 CLIMATE

The climatic conditions in the Karibib district are characterised by warm summers and relatively cool winters (Meteoblue, 2023). The mean temperatures range between 25.5°C and 26°C in summer and 14.5°C and 17.5°C in winter. The warmest time of the year is from December to February, while the coolest months of the year are from May to August. The average annual rainfall in this area is relatively low. The highest annual rainfall occurs between January and April, reaching 20mm as shown in Figure 10. The site area receives wind speeds less than 38 km/h, with predominant wind direction being East-Northeast (ENE) as shown in Figure 11 below.

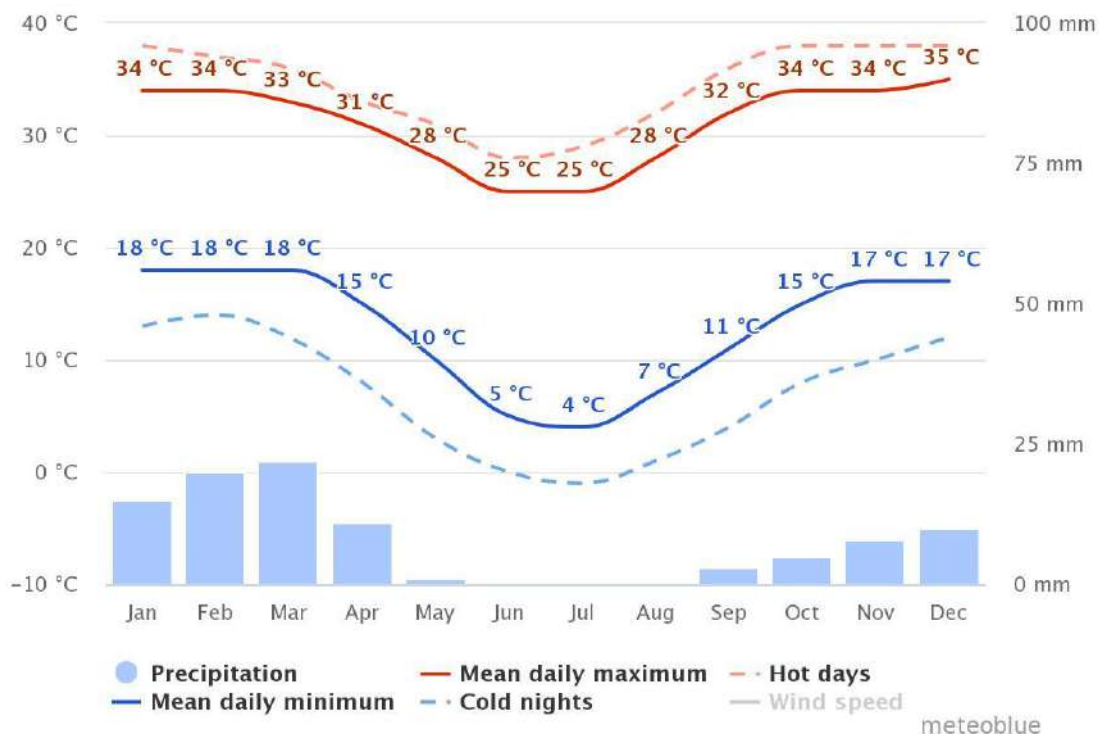


Figure 10 - Annual expected weather conditions (Meteoblue, 2022)

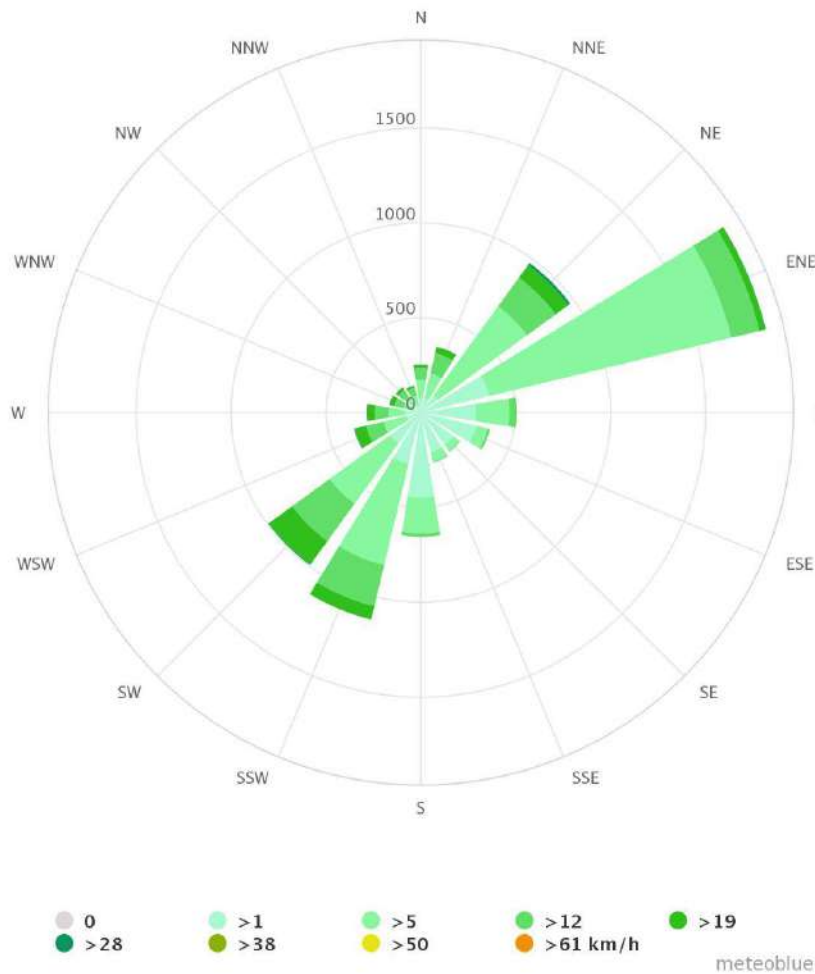


Figure 11 - Average wind directions for the area.

5.2 FLORA AND FAUNA DIVERSITY

Powerline clearing disrupts natural habitats, inducing corridors and/or edge effect. In natural forests and landscapes, edges produced by splitting habitats tend to have increased solar radiation, lower humidity, higher air temperatures and higher soil temperatures, compared to the interior of habitats (Eldegard, Totland, & Moe, 2015). Fragmentation caused by powerline clearing could induce genetic drift, impacting population productivity which influences species diversity, composition and ecosystem functioning (Bartzke, May, Bevanger, Stokke, & Roskaft, 2014). A biodiversity assessment identified Limestone/marble hills as a key area associated with high numbers of vertebrate flora and fauna and ephemeral drainage lines are associated with larger trees within the Twin Hills Project proposed site.

In the general Karibib area there is approximately 74-101 large trees and shrub species (> 1 m) of which 8 species are classified as endemic, 4 species as near endemic. Through the biodiversity assessment, it was found that 28, 36 and 25 species were found in plains, hills and rivers in the

proposed area respectively. A total of 30 grass species was identified in the proposed area. It was concluded that the unique vegetation is not expected to be heavily impacted by the activities of the proposed project. There is a moderate to high terrestrial faunal biodiversity in the general Karibib area (Mendelsohn, Jarvis, Roberts, & Robertson, 2002). 87 species of mammals are expected to occur in Karibib, of which 10 species (11.5%) are classified as endemic. Species that are of great concern in the Karibib area include Namibian wing-gland bat and Southern African hedgehog.

5.3 REPTILE AND AMPHIBIAN DIVERSITY

In the proposed area the reptile diversity is high with approximately 75 species with almost half being endemic, i.e. 45% endemism. Important species associated with this area include tortoises (*Stigmochelys pardalis* and *Psammobates oculiferus*); pythons (*Python anchietae* and *P. natalensis*); Namibian wolf snake (*Lycophidion namibianum*); monitor lizard (*Varanus albigularis*) and some of the endemic and gecko species – e.g. *Pachydactylus* species which is not studied well.

According to Mendelsohn *et al* (2002) the amphibian diversity is closely related to the average rainfall patterns with low to moderate numbers in the Karibib district. This may be due to amphibian attraction to open surface water, which depends on the amount of rainfall that occurs. The biodiversity study identified ephemeral dams and pans as an important habitat for amphibians. There are 7 species expected to occur in this area, 2 of which are endemic: *Poyntonophrynus hoeschi* and *Phrynomantis annectens*.

5.4 AVIAN DIVERSITY

The area of the proposed site has a relatively moderate to high bird biodiversity which may also be an indication of a greater range of different habitats (Mendelsohn, 2002). There is an estimation of 180 bird species in the Karibib area according to an avifauna baseline study (Appendix C). There were 14 high priority species identified which includes a critically endangered White-backed Vulture. The endangered and near-endangered species include the Ludwig's and Kori Bustard, Lappet-faced Vulture and Martial Eagle (Scott & Scott, 2023). A recent survey indicated that bustards were the most susceptible bird species involved in the significant numbers of bird collisions as a result of power lines across Africa (Pallett, Simmons, & Brown, 2022). Smaller birds may be impacted less because they have higher breeding rates to ensure continued population productivity (Pallett J. , 2014). Approximately 47 000 Ludwig's bustards are killed in South Africa each year due to power lines, other large bird species killed at a high rate includes flamingos, storks, vultures and secretarybirds (Pallett, Simmons, & Brown, 2022). This is a major concern and critical mitigation measures will be required to reduce the collision impacts on large bird species.

5.5 TOPOGRAPHY, GEOLOGY AND SOILS

The proposed project site is dominated by calcisols, (commonly called calcretes), regisols, and rocky outcrops. The eastern portion of the site is characterised by steep slopes and hills, whereas the western portion of the site is relatively flat. The northern part of the area has gentle slopes, and the southern portion has a marble ridge. The proposed area is dominated by gypsic/neocarbonate soil characterised by soft and hardened gypsum accumulation in alluvial material, weak structure and colour variegation. Red apedal is also present with a red colouring and moderate to strong structure while other sections in the area had weaker structures.

5.6 SOCIO-ECONOMIC ENVIRONMENT

The population of Namibia has grown rapidly, reaching 2.6 million in 2023 which is approximately 500 000 more than 10 years ago (worldometer, 2023). The population of Karibib, near which the proposed project is located has an estimated population of 13 300 with an estimated population density of 0.9 person per km² (NSA, 2011).

The powerline runs across the Twin Hills Gold Project, which intends to mine for gold deposits. Mining accounts for approximately 10% of Namibia's annual Gross domestic product (GDP). Based on existing preliminary feasibility studies for the project, there is probable cause to assume that Twin Hills will become one of Namibia's most significant gold mine projects. The proposed project has the potential to enhance the socio-economic development within the area through the power supply to the Twin Hills Gold Project. As a result, availability of power could result in other socio-economic opportunities such as expanding urbanisation of the Karibib district, improving the living conditions for the local community.

6 IMPACT IDENTIFICATION AND EVALUATION METHODOLOGY

6.1 INTRODUCTION

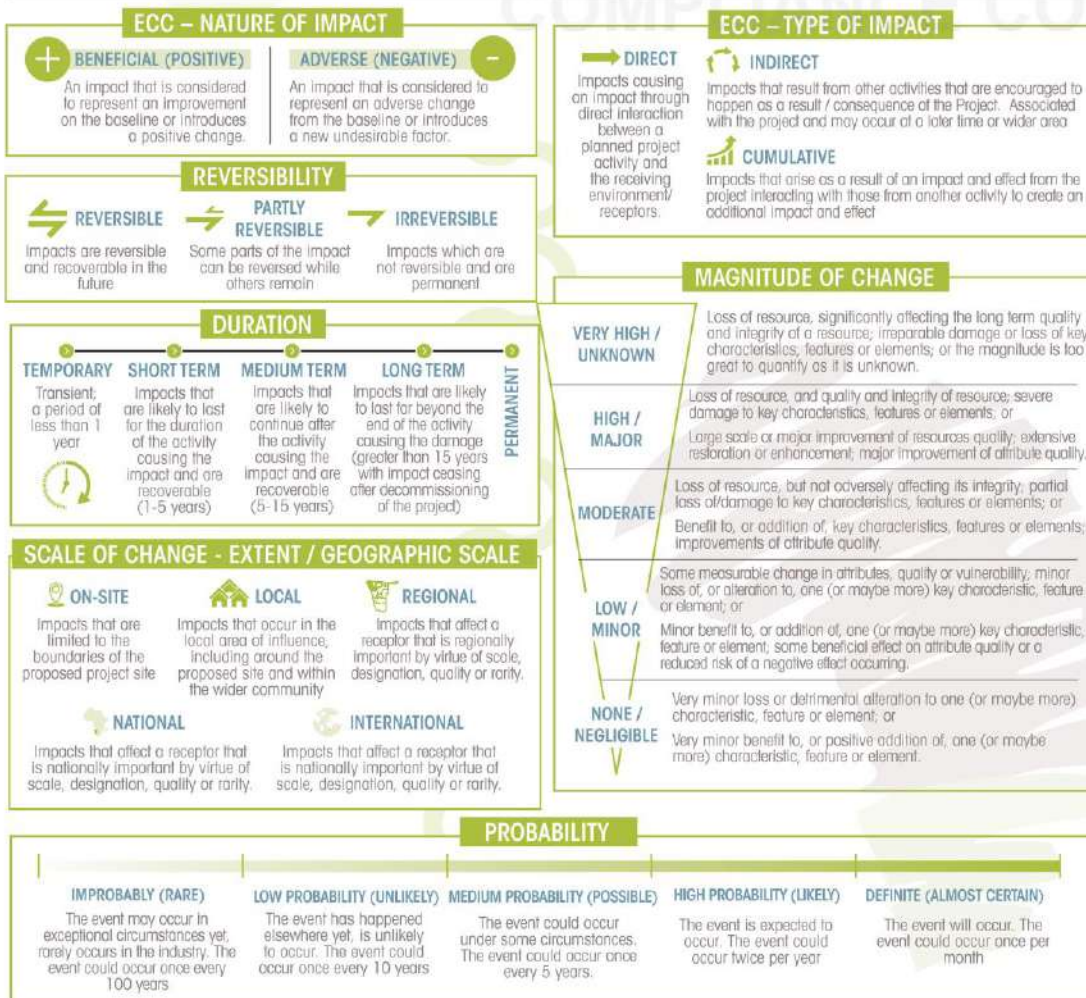
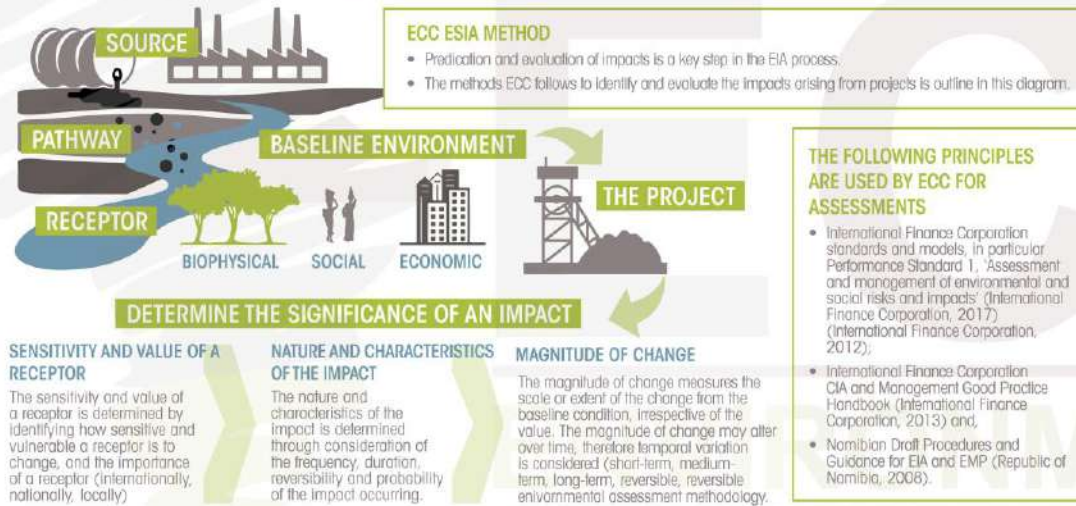
The impact assessment method described in this chapter by ECC is designed to systematically identify and evaluate potential environmental and social impacts that may arise from a proposed project. The method takes into consideration the baseline characteristics of the project area and assesses the significance of impacts based on various factors, including the sensitivity and value of environmental and social receptors, the nature and characteristics of the potential impact, and the magnitude of potential change.

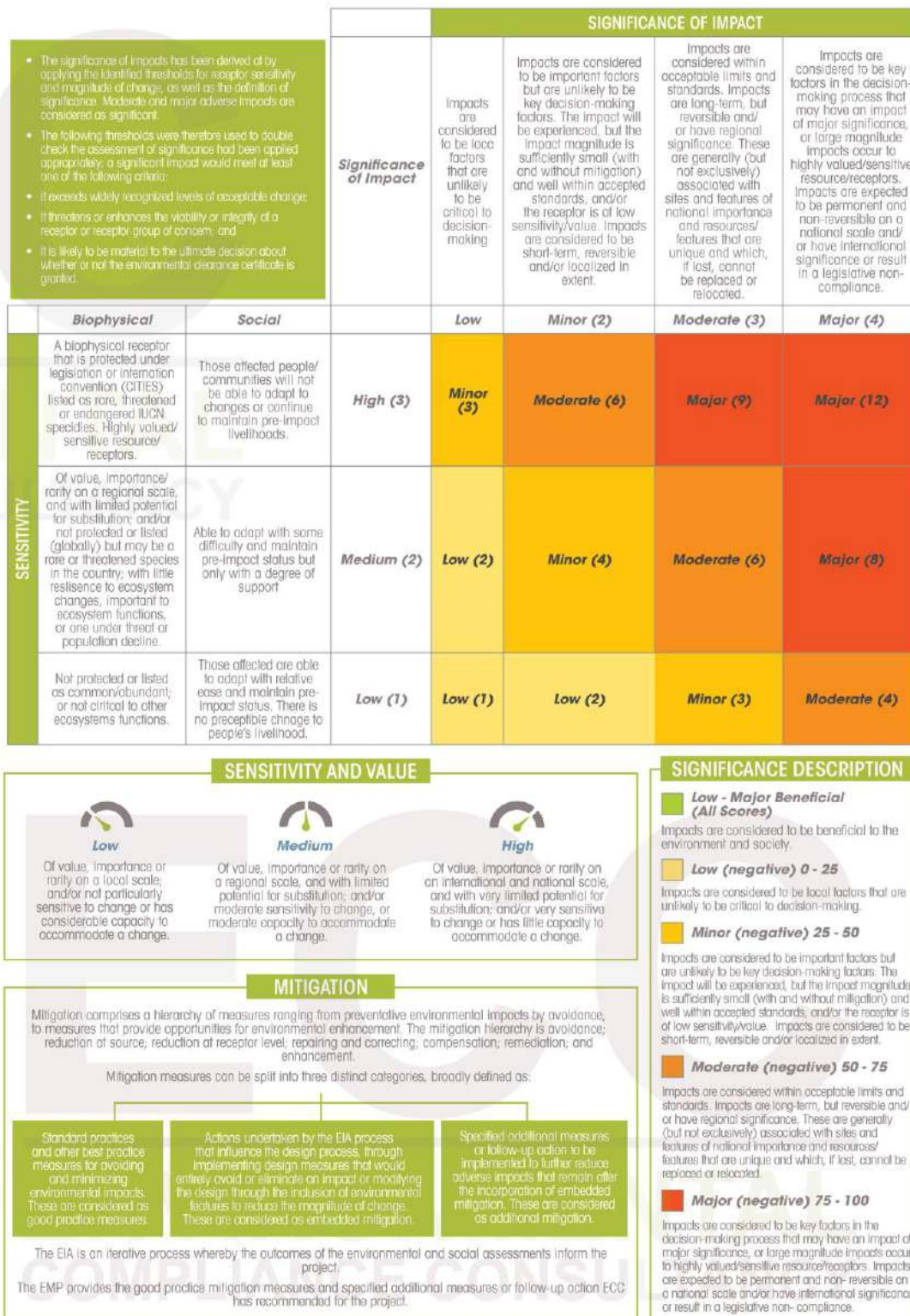
The method shown in Figure 12 provides assessment guidance that is used to evaluate impacts, and it also acknowledges any limitations, uncertainties, and assumptions associated with the assessment methodology. It outlines how impacts are identified and evaluated, and how the level of significance is derived. The method also addresses the application of mitigation measures in the assessment, and how additional mitigations are identified.

This chapter provides a structured approach for evaluating the potential impacts of a proposed project on the environment and social aspects. It considers various factors to determine the significance of impacts and provides guidance on how to identify and evaluate potential impacts. It also recognises the limitations and uncertainties associated with impact assessment methodologies, which adds transparency and credibility to the assessment process.

Overall, this chapter provides a comprehensive and systematic approach for conducting impact assessments, which can help ensure that potential environmental and social impacts are thoroughly evaluated and addressed in the decision-making process for the proposed project. However, it is important to note that the effectiveness of this method would ultimately depend on its implementation and the accuracy of the baseline data and assumptions used in the assessment. Therefore, regular reviews and updates of the methodology based on new information and feedback from stakeholders would be recommended to improve its accuracy and relevance.

ECC IMPACT PREDICTION AND EVALUATION METHODOLOGY





© COPYRIGHT & PROPERTY OF ENVIRONMENTAL COMPLIANCE CONSULTANCY | NO PART OF THIS DOCUMENT IS TO BE COPIED OR REPRODUCED.

Figure 12 - ECC ESIA methodology based on IFC standards.

6.2 ASSESSMENT GUIDANCE

The principal documents used to inform the assessment method are:

- International Finance Corporation standards and models, in particular Performance Standard 1, ‘Assessment and management of environmental and social risks and impacts’ (International Finance Corporation, 2017) (International Finance Corporation, 2012),
- International Finance Corporation CIA and Management Good Practice Handbook (International Finance Corporation, 2013); and,
- Namibian Draft Procedures and Guidance for EIA and EMP (Republic of Namibia, 2008).

6.3 LIMITATIONS, UNCERTAINTIES AND ASSUMPTIONS

The limitations and uncertainties associated with the assessment methodology in Namibia were observed to include the absence of topic-specific assessment guidance, with a generic methodology being applied based on IFC (International Finance Corporation) guidance and professional judgement. This implies that there may be limitations in terms of tailoring the assessment to specific topics or issues relevant to Namibia, and that the methodology may not fully capture the unique characteristics and nuances of the local context.

It is important to note that the limitations and uncertainties identified in the assessment methodology, shown in Table 5, may introduce potential biases or inaccuracies in the assessment results. Therefore, it is recommended to regularly review and update the methodology to address these limitations and uncertainties, and to ensure that it remains robust and relevant for the specific context of Namibia. Additionally, incorporating stakeholder feedback and local knowledge can also contribute to improving the accuracy and comprehensiveness of the assessment process.

Table 5 - Limitations, uncertainties and assumptions

Limitation/uncertainty	Assumption
Difficulty in obtaining confirmed records of bird flight paths.	A combined Southern African Bird Atlas Project (SABAP) 1&2 and other data were used to provide a representative indication of the bird species likely to occur in the study area throughout the seasonal and inter-annual cycles.

7 IMPACT ASSESSMENT FINDINGS AND PROPOSED MITIGATION MEASURES

This chapter presents the findings of the impact assessment for the proposed project, with a focus on significant potential impacts. The design of the proposed project and best practice measures were considered during the assessment to identify likely significant impacts and recommend mitigation measures. A summary list of potential impacts was provided, including water (surface and groundwater), soil, landscape (visual impacts, sense of place), socioeconomics (employment, demographics, and land use), noise, ecology (fauna and flora), air quality (emissions, pollutants, and dust), and heritage (including culture, history, archaeology, and palaeontology).

Table 6 outlines the impact assessment findings, identifying the activities that could be the source of impacts, the receptors that could be affected, and the pathways between them. Where activities or receptors have not been identified and analysed, potential impacts are deemed unlikely, and no assessment or justification is provided. Justification for further assessment may or may not be required where the activity, receptor, and pathway have been identified and analysed.

Table 6 - Impact assessment findings and proposed mitigation measures

Description	Details	
Aspect	Biophysical Environment	
Description of activity	Habitat clearing and destruction during construction of the overhead powerline	
Description of impact	Loss/migration of birds, death of birds	
Assessment of impact	Receptor	Avifauna
	Effect/description of the magnitude	Adverse Direct Irreversible High Short term Local Likely
	Value of sensitivity	High
	Magnitude of change	Minor
	Significance of impact prior to mitigation	Minor (4)
Impact management/control measures	– Pre-inspection of any avifauna nesting areas especially white-backed vulture and Ludwig’s bustard nests (critically endangered and endangered species).	

Description	Details
	<ul style="list-style-type: none"> – Disturbance of nesting birds such as the white-backed vulture and Ludwig bustard should be avoided during the construction. – Awareness campaigns and inductions with a focus on the value of biodiversity and negative impacts of disturbance, especially to breeding birds.
Residual impact after mitigation	Low (1)

Description	Details	
Aspect	Biophysical Environment	
Description of activity	Avifauna collision and electrocution by direct contact, or streamers on powerline structures	
Description of impact	Injuries/death to large birds, loss of avifauna diversity	
Assessment of impact	Receptor	Avifauna
	Effect/description of the magnitude	Adverse Direct Irreversible High Long-term On-site Likely
	Value of sensitivity	High
	Magnitude of change	Moderate
	Significance of impact prior to mitigation	Major (9)
Impact management/control measures	<ul style="list-style-type: none"> – Design the powerline structures according to South African National Standards 10280 standards, in which the safety clearances between phase and earth are specified. – Sensitive sections of powerline should be marked to increase visibility, i.e., the use of bird deterrents such as bird flight diverters. – The top OPGW (earth/ground) wire should be marked, using large SWAN-FLIGHT Diverters in order to increase the visibility of the line. – The bird flight diverters should be alternating grey and yellow and fitted at a distance of 5 – 10 m apart and the full length of each span should be marked. – Construct a simple bird perch device on top of the tower structure on top of the 66 kV tower structure to encourage birds 	

Description	Details
	<p>to perch above dangerous structures (insulators) rather than on them or use braced insulators in vulture-sensitive areas.</p> <ul style="list-style-type: none"> – Disturbance of nesting birds, in particular, large raptors/vultures, or Kori Bustards should be avoided, if encountered during operations. – Ensure that the entire powerline route is monitored for any signs of bird mortalities resulting from the operation of the line e.g., regular monitoring patrols should be carried out once a month for at least the first year after construction, and thereafter at least once per quarter. – Existing power lines in the area should also be inspected from time to time, for cumulative impacts. – Record all bird mortalities on a standardised form, with the GPS coordinates and powerline structure and other details, and photographs of the carcass (especially the head of the bird), powerline structure and general habitat.
Residual impact after mitigation	Minor (4)

Description	Details	
Aspect	Biophysical Environment	
Description of activity	Vegetation removal during construction	
Description of impact	Loss of tree and shrub diversity, especially protected and endemic species	
Assessment of impact	Receptor	Terrestrial Ecology and Biodiversity
	Effect/description of the magnitude	Adverse Direct Irreversible Low Temporary On-site Likely
	Value of sensitivity	Medium
	Magnitude of change	Low
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> – Avoid sensitive areas with vulnerable species. – Obtain a permit to remove protected and endemic species. – Relocate removed endemic species. 	

Description	Details
Residual impact after mitigation	Low (1)

Description	Details	
Aspect	Terrestrial ecology and biodiversity	
Description of activity	Increased movement of vehicles, machinery, and equipment	
Description of impact	Resident and nesting organisms such as reptiles and amphibians can be disturbed, injured or killed	
Assessment of impact	Receptor	Terrestrial ecology and biodiversity
	Effect/description of magnitude	Adverse Direct Partly reversible Moderate Short term On-site Possible
	Value of sensitivity	Low
	Magnitude of change	Minor
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> - Restrict movements to areas of activities only. - Use existing tracks and routes only. - Identify rare, endangered, threatened and protected species in advance. - Route new tracks around protected species and sensitive areas - Restrict movements to daytime hours. - No driving off designated access routes (into the bush) / off-road driving - No animals or birds may be collected, caught, consumed, or removed from site 	
Residual impact after mitigation	Low (1)	

Description	Details	
Aspect	Terrestrial ecology and biodiversity	
Description of activity	Increased disturbance of areas with natural vegetation	
Description of impact	Alien species and weeds can be introduced to the area	
Assessment of impact	Receptor	Terrestrial ecology and biodiversity

	Effect/description of the magnitude	Adverse Direct Reversible Minor Short term On-site Possible
	Value of sensitivity	Low
	Magnitude of change	Minor
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> - All project equipment arriving on site from an area outside of the project or coming from an area of known weed infestations (not present on the project site) should have an internal weed and seed inspection completed prior to equipment being used. - Monitor areas for weed and alien species where exploration was active. - Eradicate weeds and alien species as soon as they appear. - Make workers aware of alien species and weeds 	
Residual impact after mitigation	Low (1)	

Description	Details	
Aspect	Community	
Description of activity	Construction of the overhead powerline	
Description of impact	Occupational health and safety of workers	
Assessment of impact	Receptor	Employees
	Effect/description of the magnitude	Adverse Direct Irreversible Moderate Long-term On-site Unlikely
	Value of sensitivity	Medium
	Magnitude of change	Low
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> - Use correct PPE in the workplace. - Having an SOP and complying with it - Complying with all applicable national regulations and laws to minimise risks at the workplace. - Ensuring the appropriate supervision of activities 	

Description	Details
	<ul style="list-style-type: none"> – If necessary, providing site inductions to workers about health and safety. – Proper use and storage of material and equipment
Residual impact after mitigation	Low (1)

Description	Details	
Aspect	Community	
Description of activity	Increased movement of vehicles, machinery, and equipment disturbing the Karibib Air force base approximately 2 km away.	
Description of impact	Noise, visual disturbance and loss of sense of place from dust	
Assessment of impact	Receptor	Community
	Effect/description of magnitude	Adverse Direct Reversible Moderate Temporary Local Likely
	Value of sensitivity	low
	Magnitude of change	low
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> – Restrict speed of vehicles (<30 km/h) – Specific activities that may generate dust and impact nearby residents. – Dust generating activities should be avoided during strong wind events. – All vehicles and machinery / equipment to be shut down or throttled back between periods of use. – Maintain good housekeeping 	
Residual impact after mitigation	Low (1)	

Description	Details	
Aspect	Community	
Description of activity	Visual impacts from the construction of the powerline	
Description of impact	Visual impacts and loss of sense of place	
Assessment of impact	Receptor	Community

	Effect/description of magnitude	Adverse Direct Irreversible Low Long-Term Local Likely
	Value of sensitivity	low
	Magnitude of change	low
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> - Maintain good housekeeping. - Suggest an alternative route. - Engage with the surrounding residents about the construction activities. 	
Residual impact after mitigation	Low (1)	

Description	Details	
Aspect	Community	
Description of activity	Construction of the overhead powerline	
Description of impact	Employment opportunities	
Assessment of impact	Receptor	Community
	Effect/description of magnitude	Beneficial Direct Reversible Moderate Temporary Local Definite
	Value of sensitivity	Medium
	Magnitude of change	Low
	Significance of impact prior to mitigation	Low (2)
Impact management/control measures	<ul style="list-style-type: none"> - Providing job opportunities for the local community - Promoting local procurement as far as possible - Enhancing the development of local skills 	
Residual impact after mitigation	Low Beneficial	

7.1 CRITICAL MITIGATION MEASURES

7.1.1 AVIFAUNA

The identified endangered and protected species on the proposed site include different vulture species, Ludwig bustard birds and the Secretarybird species. Some species of vultures use overhead powerlines as roosting and perching stops putting them at a higher risk of electrocution and accidental collision. The bustard birds are large, heavy flyers which lacks the ability to manoeuvre easily. Recent literature highlights the increased vulnerability of Ludwig bustards and Secretarybirds to overhead powerlines resulting in thousands of fatalities per year.

It is recommended that the nesting areas of the different species are investigated before the construction phase. Multiple bird deterrent methods that are environmentally friendly, safe and sustainable may be used to either alert or repel bird species. Visual deterrent may include flashing or blinking lights. Plastic bird spikes are non-lethal, non-conductive and able to withstand extreme temperatures. These bird spikes are designed to prevent bird landings, protecting the birds and the infrastructure. The top horizontal cable (OPGW/earth) of a powerline should be marked, for the full length of each span as seen in Figure 13. Bird-Flight Diverters resembles round wires and are specifically designed for overhead powerlines to reduce collisions by making the powerlines more visible (Figure 13) (Scott & Scott, 2023). Bird-Flight Diverters should be alternating grey and yellow and fitted at 5 – 10 m apart and the full length of each span should be marked.



Figure 13 - Recommended sections of powerline to be marked for the proposed 66kV powerline for the two routes

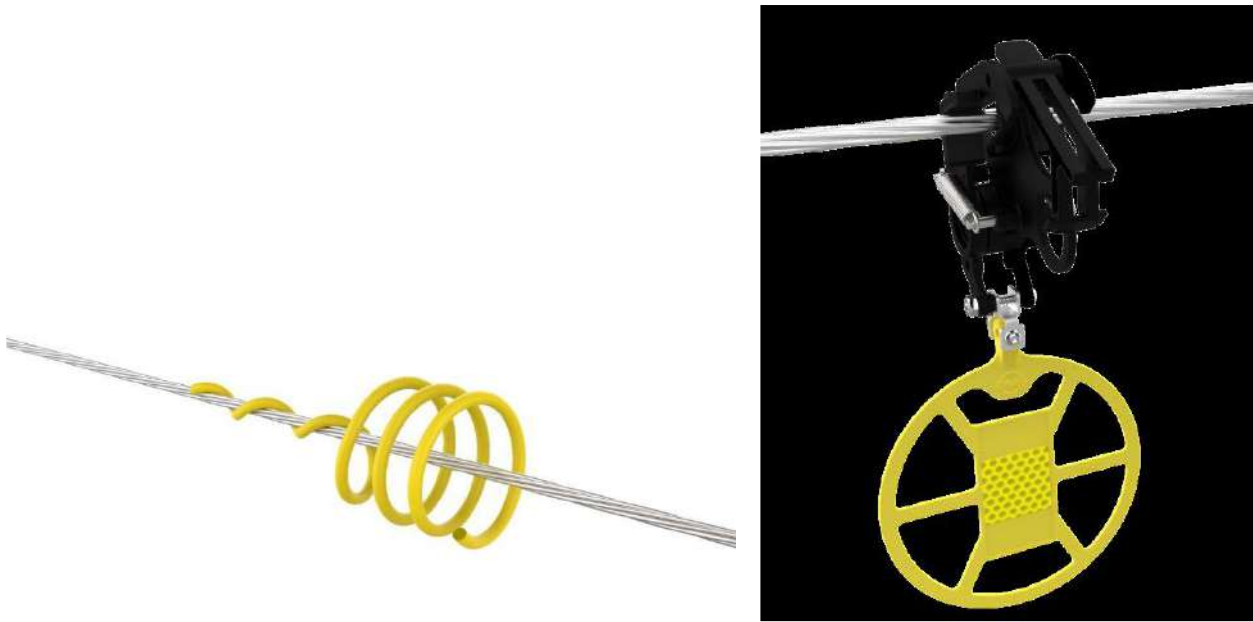


Figure 14 - Powerline marking devices: BIRD-FLIGHT Diverters (left) and RAPTOR-CLAMP Diverters (right)

8 CONCLUSION

ECC's impact assessment methodology was used to conduct the scoping report for the proposed project to identify if there is a potential for significant impacts to occur as an outcome of the proposed project.

This scoping report identified that there was no major potential risk that requires further specialist studies and assessment. The identified impacts were found to be minor. Various mitigation measures have been identified and listed for implementation in the EMP to avoid and reduce effects as far as reasonably practical. This will ensure that the environment is protected, and unforeseen effects and environmental disturbances are avoided.

BIBLIOGRAPHY

- Bartzke, G. S., May, R., Bevanger, K., Stokke, S., & Roskaft, E. (2014). The effects of powerlines on ungulates and implications for power line routing and rights-of way management. *International Journal of Biodiversity and Conservation*, 647-662.
- Eldegard, K., Totland, O., & Moe, S. R. (2015). Edge effects on plant communities along power line clearings. *Journal of Applied Ecology*, 871-880.
- Enviro Dynamics . (2015). *Environmental Assessment for the Proposed Subdivision and Establishment of Six Townships within the Karibib Townlands .*
(February 2016). *Karibib Urban Structure Plan*.
- Knoema. (2022, December 13). *Population and HOUsing Census Data Namibia*. Retrieved from Knoema Data Hub: knoema.com
- Mendelsohn, J., Jarvis, A., Roberts, C., & Robertson, T. (2002). *Atlas of Namibia: A Portrait of the Land and its People*. Windhoek: Namibia Nature Foundation.
- Ministry of Health and Social Services. (2021). *National Tuberculosis and Leprosy Programme Annual Report: 2020-2021*. Windhoek: Mlnistry of Health and Social Services.
- Namibia Statistics Agency. (2019). *Namibia Labour Force Survey 2018 Report*. Windhoek: NSA.
- Namibian statisitic Agency. (2011). *Namibia Population and Housing Census*. Windhoek: NSA.
- Pallett, J. (2014). *Environmental Impact Assesmen for the proposed development of the Okanjande graphite mine and exploration activities*. Windhoek.
- Pallett, J., Simmons, R. E., & Brown, C. J. (2022). Staggered towers on parallel transmission lines: a new mitigation measure to reduce collisions of birds, especially bustards. *Namibian Journal of Environment*, 14-21.
- Scott, H. A., & Scott, R. M. (2023). *Environmental Impact Assessment for the Osino Twin Hills Gold Mine Project 66 kV power line, Erongo Region, Namibia: Avifauna baseline/scoping and assesment*. Windhoek: African Conservation Services cc.
- <https://www.worldometers.info/world-population/namibia-population/>

APPENDIX A – ENVIRONMENTAL MANAGEMENT PLAN

APPENDIX B – PUBLIC CONSULTATION DOCUMENT

APPENDIX C – SPECIALIST STUDY (AVIFAUNA)