
KAOKO GREEN ENERGY SOLUTIONS (PTY) LTD

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT REPORT

The Proposed Installation of Five (5) Underground Power
Transmission Cables for the “/Hao” Waveroller Pilot Project

Wlotzkasbaken Settlement, Erongo Region, Namibia

February 2024

Prepared by:



Prepared for:



| DOCUMENT CONTROL | |
|--|---|
| REPORT TITLE | ESIA FOR THE PROPOSED FIVE (5) POWER TRANSMISSION CABLES LOCATED NEAR WLOTZKASBAKEN SETTLEMENT, ERONGO REGION, NAMIBIA. |
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CONSULTANT'S EXPERTISE

I.N.K Enviro Consultants cc is the independent firm of environmental consultants that has been appointed by Kaoko Green Energy Solutions (Pty) Ltd to conduct the ESIA process.

Immanuel N. Katali, the Environmental Assessment Practitioner holds a B. Arts (Honours) Geography, Environmental Studies and Sociology and has over seven years of relevant experience in conducting/managing Environmental and Social Impact Assessments (ESIAs), and Environmental Compliance/Monitoring Audits in Namibia. Immanuel is certified as an Environmental Assessment Practitioner under the Environmental Assessment Professionals Association of Namibia (EAPAN).

DECLARATION OF INDEPENDENCE AND DISCLAIMER

I.N.K Enviro Consultants cc herewith declare that this report represents an independent assessment of the proposed “/Hao” Waveroller Pilot Project, on the request of Kaoko Green Energy Solutions (Pty) Ltd.

The Environmental Consultant has prepared this report based on an agreed scope of work and acts in all professional manner as an Independent Environmental Consultant to Kaoko Green Energy Solutions (Pty) Ltd and exercises all reasonable skill and care in the provision of its environmental professional services in a manner consistent with the level of expertise exercised by members of the environmental profession.

The information, statements and commentary contained in this report have been prepared by I.N.K Enviro Consultants cc from information provided by Kaoko Green Energy Solutions (Pty) Ltd and the Public Participation Process. I.N.K Enviro Consultants cc does not express an opinion as to the accuracy or completeness of the information provided, the assumptions made by the party that provided the information or any conclusions reached. I.N.K Enviro Consultants cc has based this report on information received or obtained, on the basis that such information is accurate and, where it is represented to I.N.K Enviro Consultants cc as such, complete.

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EXECUTIVE SUMMARY

Project Background

Kaoko intends to apply for an Environmental Clearance Certificate (ECC) for its proposed installation of 5 Power Transmission Cables to transmit electricity from offshore where WaveRollers are proposed to be deployed, to the NamPower grid located onshore. The proposed development is located north of Wlotzkasbaken settlement, Erongo Region, Namibia.

The proposed power cables will cover a linear distance of approximately 300 - 500 m offshore to the coastline and installed on the seabed. It will further cover an approximately 1.7 km of underground installation from the shoreline to the Nampower substation located onshore.

Project Need and Desirability

The proposed Power Transmission Cables form part of the linear infrastructure for the WaveRoller Pilot Project. The objective of the project is to transmit power to the NamPower Substation located onshore. The project will generate clean and affordable electricity from ocean waves and then deliver that 200 MWh per year of electricity to communities close to the coast of the Erongo Region in Namibia and tap into Southern Africa Power Pool (SAAP).

Scoping

The main purpose of scoping is to indicate which environmental aspects relating to the proposed project might have an impact on the environment, to assess them and provide management and mitigation measures to avoid or minimise these impacts.

Public Participation Process

The public participation process for the proposed project is conducted to ensure that all persons and/or organisations that may be affected by, or interested in the proposed project, were informed of the project and could register their views and concerns. By consulting with relevant authorities and I&APs, the range of environmental issues to be considered in this Report has been given specific context and focus.

General Assumptions and Limitations

The key assumptions and limitations of this ESIA Report are detailed below.

- ◆ It is assumed that the information provided by Kaoko, relating to the project activities is accurate and that the project will be implemented and operated as described.
- ◆ The predictions of the impacts of the power cables on the marine environment need to be validated by regular field observations and subsequent monitoring.

- ◆ The results of specialist study formed the basis for the assessment of impact significance. The specialist investigations are conducted by an independent specialist considered to be experts in their fields. It was assumed that the information from these sources is relevant and accurate.
- ◆ Considering the dynamic nature of the marine environment and its susceptibility to the influence of climate change e.g. sea level rise, increases in frequency of wave storms, are not evidently considered in this study.
- ◆ Area is frequented by the Orano Desalination Plant activities, recreational fishers and off-road driving, as such the beach area is not pristine.

Identification of Potential Environmental Aspects and Potential Impacts

The scoping phase which included a consultation process with key stakeholders that included government authorities and I&APs allowed the opportunity to raise the issues associated with the project development.

Assessment Approach and Methodology

The assessment largely adopted a desktop approach, where qualitative information on the environment was collected during a site visit and a beach survey conducted on 01 December 2023. The extent of the impacts and assessment ratings are not quantified over the larger project area.

The site visit and beach survey collected sediment for grain size analysis, wave data entailing the height and frequency, as well as sediment samples for invertebrates. Counts of avifauna and marine flora were also taken into consideration. No exploratory dives and sediment grab sampling were carried out in deeper water of the proposed location. This approach is deemed adequate for placing into context the potential impacts associated with the establishment of the proposed installation for this pilot project.

An assessment of the potential positive and negative impacts associated with the installation and operations phase of the proposed pilot project is provided below. As an outcome of the Scoping Phase, specialist input was requested for some of the environmental issues and has been included in this assessment.

Other potential environmental impacts resulting from the proposed project activities and facilities (also identified during the Scoping Phase of the ESIA) were assessed by I.N.K and are also presented.

- ◆ Both the criteria used to assess the impacts and the Method of determining the frequency/severity of the impacts is outlined.

Environmental and Social Management Plan

The potential impacts that required further assessment include the following:

- ◆ Potential Impacts on the Marine Ecology.
- ◆ Potential Impacts on the Lichens and Coastal Hummock Belt Species

Conclusions and Recommendations

It was concluded from the assessment that the installation of the power transmission cables has minimal impacts on the overall marine ecology and inland biodiversity due to its small scale activities. The potential marine impacts may arise from the human activities during installation, which could disturb the marine flora, while, the inland impacts may arise from the drilling and creation of trenches which could disturb the fauna and flora.

However, the mitigation measures that have been identified and recommended by I.N.K will promote the positive impacts of the project, as well as reduce the negative impacts to acceptable levels. An ESMP was further developed which identifies potential impacts of the project during the installation and operation phases. The ESMP is a legally binding document to which Kaoko must adhere to.

Despite these impacts, I.N.K concludes that the Proponent should be allowed to undertake the proposed installation of power transmission cables, provided the potential impacts in the ESMP are mitigated.

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LIST OF ACRONYMS, ABBREVIATIONS AND UNITS

| Acronyms / Abbreviations / Units | Definition |
|----------------------------------|--|
| BCLME | Benguela Current Large Marine Ecosystem |
| BID | Background Information Document |
| CO ₂ | Carbon Dioxide |
| DAE | Department of Agricultural Engineering |
| DEA | Directorate of Environmental Affairs |
| DO | Dissolved Oxygen |
| EAP | Environmental Assessment Practitioner |
| ECC | Environmental Clearance Certificate |
| EEZ | Exclusive Economic Zone |
| EIA | Environmental Impact Assessment |
| EIB | European Investment Bank |
| EMA | Environmental Management Act |
| ESF | Environmental and Social Framework |
| ESMP | Environmental and Social Management Plan |
| ESS | Environmental and Social Safeguard |
| GW | GigaWatt |
| ha | Hectares |
| HAB | Harmful Algae Blooms |
| IPF | Investment Project Financing |
| IRR | Issues and Response Report |
| IMO | International Maritime Organization |
| I&APs | Interested and Affected Party |
| Km | Kilometer |
| kW | kiloWatt |
| M.A.S.L | Meters Above Sea Level |
| M | Meter |
| MAWLR | Ministry of Agriculture, Water and Land Reform |
| MD | Ministry of Defense |
| MEFT | Ministry of Environment, Forestry and Tourism |
| mm | Millimeter |
| MME | Ministry of Mines and Energy |
| MWh | MegaWatt |
| MWT | Ministry of Works and Transport |
| NACOMA | Namibian Coast Conservation and Management |
| NAMPOWER | Namibia Power Corporation |

| Acronyms / Abbreviations / Units | Definition |
|---|---|
| NDP | National Development Plan |
| PAN | Pesticides Action Network |
| PPAH | Pollution Prevention and Abatement Handbook |
| PPP | Public Participation Process |
| PTO | Power Take-Off |
| SEA | Strategic Environmental Assessment |
| SOLAS | Safety of Life at SEA |
| SST | Sea Surface Temperature |

1 INTRODUCTION

1.1 Purpose of the Report

Kaoko Green Energy Solutions (Pty) Ltd (hereinafter referred to as “Kaoko”) plans to implement the proposed “/Hao” WaveRoller Pilot Project.

Three (3) separate Environmental Clearance Certificate (ECC) Applications have been submitted to the Ministry of Environment, Forestry and Tourism (MEFT) for: a) the deployment of the WaveRoller technology, by AW-Energy (Finland) in the Atlantic Ocean, b) the installation of power transmission cables and b) subdivision of the industrial land.

This report focuses only on the proposed installation of five (5) Power Transmission Cables as part of the “/Hao” WaveRoller Pilot Project.

Interested and/or Affected Parties (I&APs) relating to the proposed pilot project are invited to comment on this Report. The final report, including comments received from I&APs, will be submitted to the Ministry of Fisheries and Marine Resources (MFMR), Ministry of Mines and Energy (MME) and Ministry of Works and Transport, as the Competent Authorities, for their review and consideration. In terms of Section 32 of the Environmental Management Act, 2007 (No. 7 of 2007), MFMR and MME are required to make recommendations on the acceptance or rejection of the report to the Ministry Environment, Forestry and Tourism (MEFT): Department of Environmental Affairs (DEA), who will make the final decision on the application for an environmental clearance.

Prior to the commencement of the project, an environmental clearance is required based on an approved Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP). This report describes the Environmental and Social Impact Assessment (ESIA) process being followed and provides an overview of the affected environment. It includes an assessment of the environmental impacts that the proposed activities are likely to have and sets out the consultants’ recommendations. The proposed management and mitigation measures related to the proposed activities are documented in an Environmental and Social Management Plan (ESMP).

1.2 Project Background

Kaoko intends to apply for an Environmental Clearance Certificate (ECC) for its proposed installation of 5 Power Transmission Cables to transmit electricity from offshore where WaveRollers are proposed to be deployed, to the NamPower grid located onshore (Figure 1).

The proposed development is located north of Wlotzkasbaken settlement, Erongo Region, Namibia.

The proposed power cables will cover a linear distance of approximately 300 - 500 m offshore to the coastline and installed on the seabed. It will further cover an approximately 1.7 km of underground installation from the shoreline to the Nampower substation located onshore.

Kaoko, is a Namibian private energy-generation assets development company, with its mission anchored in the potent forces of sustainability - wave, solar and wind. The company has identified the power of Namibia's coastal waves and through a pilot project, WaveRoller devices will be deployed in the Namibia water to generate clean and affordable electricity from ocean waves and then deliver that 200 MWh per year of electricity to communities close to the coast of the Erongo Region in Namibia and tap into Southern Africa Power Pool (SAAP). This development and generation of electricity from WaveRoller devices promises to breathe new life into the Wlotzkasbaken settlement area.

I.N.K Enviro Consultants cc (hereinafter referred to as I.N.K), an independent firm of environmental consultants, has been appointed to undertake the Environmental and Social Impact Assessment process for this project. For more details on the ESIA process that was followed, please refer to Section 1.4.

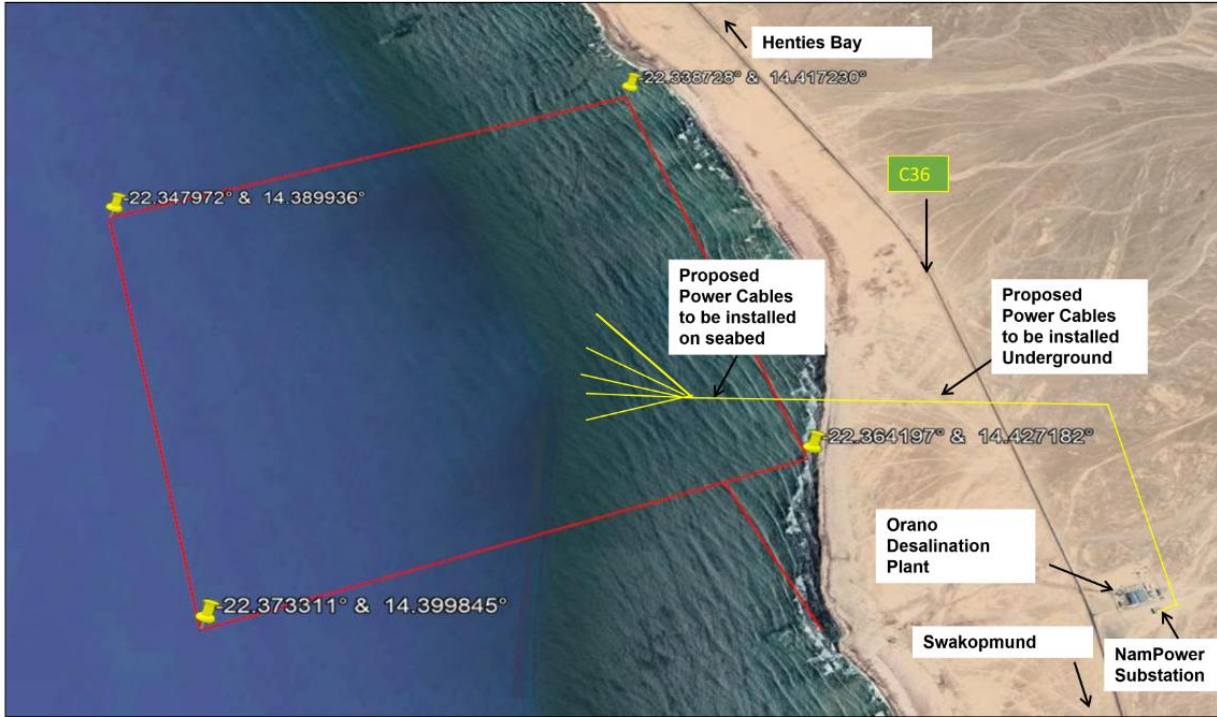


Figure 1: Proposed Power Cable Route

1.3 Project Need and Desirability

The proposed Power Transmission Cables form part of the linear infrastructure for the WaveRoller Pilot Project. The objective of the project is to transmit power to the NamPower Substation located onshore. The project will generate clean and affordable electricity from ocean waves and then deliver that 200 MWh per year of electricity to communities close to the coast of the Erongo Region in Namibia and tap into Southern Africa Power Pool (SAAP).

Therefore, the implementation of the proposed power cables is required for the realization of the WaveRoller Project. Without this implementation, the objectives and goals of the WaveRoller Project will not be executed, hence, impacting the overall financial feasibility of the Project.

1.4 Introduction to the Environmental and Social Impact Assessment Process

Environmental and Social Impact Assessments are regulated by the Ministry of Environment, Forestry and Tourism (MEFT) in terms of the Environmental Management Act, 7 of 2007. This Act was gazetted on 27 December 2007 (Government Gazette No. 3966) and enacted on 6 January 2012. The Environmental and Social Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 January 2012.

1.4.1 ESIA Process

The ESIA process that has been followed is summarized in the table below:

Table 1: ESIA Process

| ESIA OBJECTIVES | CORRESPONDING ACTIVITIES |
|---|---|
| Project initiation, Screening Phase | |
| <ul style="list-style-type: none"> ◆ Understanding of the environmental and social baseline relating to the proposed Project. ◆ Notify the decision-making authority of the proposed Project. ◆ Initiate the Environmental and Social Impact Assessment process. ◆ Site visits and identify environmental issues. ◆ Identify key stakeholders and early identification of other I&APs. | <ul style="list-style-type: none"> ◆ Project Inception and initiation meetings to discuss the Project and ESIA process requirements. ◆ Liaise with the Marine Ecology Specialist. ◆ Draft ESIA Schedule. ◆ Initiate baseline studies. ◆ Submit Application for authorisations and a Background Information Document (BID) to the authorities. ◆ Register the Project and Applications for environmental clearances with MEFT (DEA) on its online portal. ◆ Early identification of environmental aspects and potential impacts associated with the proposed Project. |
| Scoping Phase | |
| <ul style="list-style-type: none"> ◆ Notify other regulatory authorities and I&APs of the proposed Project (via newspaper advertisements, BID, emails, site notices and telephone calls). ◆ Conduct Key Stakeholder and Public meetings. ◆ Carry out specialist investigations and establish baseline environmental conditions. ◆ Determine the terms of reference for additional assessment work. ◆ Compile Scoping Report and Issues and Response Report (IRR) ◆ Distribute the Scoping Report for review and comment by relevant authorities and I&APs. ◆ Assessment of potential issues, consider comments received and compile the ESIA final report. | <ul style="list-style-type: none"> ◆ Develop Public Participatory Process (PPP) Programme. ◆ Develop I&AP database. ◆ Prepare BID and distribute to I&APs. ◆ Notify government authorities and I&APs of the Project and ESIA process (telephone calls, e-mails, BID newspaper advertisements and site notices). ◆ IAP registration and comments. ◆ Meetings with authorities and I&APs. ◆ Investigations by appointed specialists. ◆ Compilation of Scoping Report and ESMPs. ◆ Distribute Scoping Report and ESMP to all I&APs for review and comments. ◆ Assess potential issues, obtain comments and update the Scoping Report and ESMP. |

Within this framework, the required components of the ESIA report are discussed in more detail as part of the ESIA Methodology in Section 8.

ESIAs are influenced by national legislation and a range of guidelines. The legislation applicable to this project and the ESIA process is discussed further in Section 3 below.

1.4.2 ESIA Team

I.N.K Enviro Consultants cc is the independent firm of consultants that has been appointed by Kaoko to undertake the Environmental and Social Impact Assessment and related processes. The full ESIA team comprises of a Marine Ecologist as per the following table below.

Table 2: ESIA Team

| Specialist | Designation | Tasks and Roles | Company |
|------------------------|----------------------------------|---|--|
| Mr. Immanuel N. Katali | Project Manager Social Expert | Management of the process, team members and other stakeholders. Report compilation and process review. | I.N.K Enviro Consultants cc |
| Ms. Mayday Haulofu | Marine Ecology Specialist | Marine Ecology Assessment | Envirodu Consulting and Training Solutions |

2 SCOPING METHODOLOGY

2.1 Information Collection

An assessment focusing on both the potential marine and onshore disturbance and displacement and looking at the potential marine and onshore fauna and flora impacts as a result of the project was conducted.

From desktop study methodology and literature review, the description will be based on, inter alia, a review of existing information and data from local and international scientific literature and information sourced from the internet sources and complemented by a beach and site survey in the proposed area.

Therefore, I.N.K used various information sources to identify and assess the issues associated with the proposed project as per the following:

- ◆ Site visit by I.N.K.
- ◆ Consultation with Kaoko Project Technical Team.
- ◆ Consultation with MEFT via online application system.
- ◆ Similar ESIA report in the vicinity of Wlotzkasbaken - Desalination Plant and Water Carriage System to Secure Water Supply to the Central Coast, Windhoek And En-Route Users (SLR, 2021).
- ◆ Other WaveRoller ESIA's conducted in Europe.
- ◆ Consultation with I&APs.
- ◆ Atlas of Namibia.
- ◆ Google Earth.
- ◆ Internet sources.

2.2 Scoping

The main purpose of scoping is to indicate which environmental aspects relating to the proposed project might have an impact on the environment, to assess them and provide management and mitigation measures to avoid or minimise these impacts.

Table 3 outlines the Scoping requirements as set out in Section 8 of the Environmental and Social Impact Assessment Regulations that were promulgated in January 2012 in terms of the Environmental Management Act, 7 of 2007.

Table 3: Scoping requirements stipulated in the ESIA regulations.

| Requirements for a Scoping Report in terms of the February 2012 regulations | Reference in report |
|--|---------------------------------------|
| (a) the curriculum vitae of the EAP who prepared the report; | Appendix A |
| (b) a description of the proposed activity; | Section 4 |
| (c) a description of the site on which the activity is to be undertaken and the location of the activity on the site; | Section 4 |
| (d) a description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity; | Sections 6 |
| (e) an identification of laws and guidelines that have been considered in the preparation of the Scoping Report; | Section 3 |
| (f) details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including - (i) the steps that were taken to notify potentially interested and affected parties of the proposed application; (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given; (iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues; | Sections 2.3, 2.4, 2.5 and Appendix B |
| (g) a description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity; | Sections 1.2 |
| (h) a description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity; | Sections 7 and 8 |
| (i) terms of reference for the detailed assessment; and | Section 7 & 8 |
| (j) a management plan, which includes - (i) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the | Section 9 |

environment and closure;

(ii) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and

(iii) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process that causes pollution or environmental degradation and remedy the cause of pollution or degradation and migration of pollutants.

2.3 Public Participation Process

The public participation process for the proposed project is conducted to ensure that all persons and/or organisations that may be affected by, or interested in the proposed project, were informed of the project and could register their views and concerns. By consulting with relevant authorities and I&APs, the range of environmental issues to be considered in this Report has been given specific context and focus.

Included below is a summary of the I&APs consulted, the process that was followed and the issues that were identified.

2.4 The Proposed Transmission Power Cable Project I&APs

The table below provides a broad list of persons, group of persons or organisations that were informed about the project and were requested to register as I&APs should they be interested and/or affected.

Table 4: Kaoko’s Project Stakeholders

| IAP Grouping | Organisation |
|-----------------------|--|
| Government Ministries | <ul style="list-style-type: none"> ◆ Ministry of Environment, Forestry and Tourism (MEFT) ◆ Ministry of Fisheries and Marine Resources (MFMR) ◆ Ministry of Mines and Energy ◆ Ministry of Works and Transport (MWT) ◆ Ministry of Defense (MD) |
| Local Authorities | <ul style="list-style-type: none"> ◆ Erongo Regional Council ◆ Arandis Constituency Office ◆ Wlotzkasbaken Settlement Office |
| Parastatal | <ul style="list-style-type: none"> ◆ Nampower ◆ Electricity Control Board. |

| IAP Grouping | Organisation |
|---------------------------------------|---|
| | <ul style="list-style-type: none"> ◆ ErongoRed ◆ Namport ◆ Namwater ◆ University of Namibia - Sam Nujoma Campus |
| Nearest Communities | <ul style="list-style-type: none"> ◆ Orano Desalination Plant ◆ Residents in Wlotzkasbaken |
| Media | <p>Newspaper adverts placed on Friday, 10 and Friday, 17 November 2023, in the following newspapers:</p> <ul style="list-style-type: none"> ◆ Die Republikein ◆ The Allgemeine ◆ The Namibian Sun. ◆ The Namib Times. |
| Other interested and affected parties | Any other people with an interest in the proposed project or who may be affected by the proposed project. |

2.5 Steps in the Consultation Process

Table 5 sets out the steps that were followed as part of the consultation process:

Table 5: Consultation Process with I&APs and Authorities

| TASK | DESCRIPTION |
|---|--|
| Notification - regulatory authorities and IAPs | |
| Notification to MEFT | I.N.K submitted the Application Form (online system) as a form of project registration and notification to MEFT. |
| I&AP identification | A stakeholder database was developed for the proposed project and ESIA process. Additional I&APs will be updated during the ESIA process as required. |
| Distribution of background information document (BID), flyers and stakeholders meeting invitation letters | <p>BIDs were made available to all I&APs on the project's stakeholder database. Copies of the BID were available on request to I.N.K.</p> <p>Stakeholder meeting invitation were given out to the residents of Wlotzkasbaken.</p> <p>The purpose of the BID was to inform I&APs and authorities about the proposed project, the ESIA process, possible environmental impacts and means of providing input into the ESIA process. Attached to the BID was a registration and response form, which provided I&APs with an opportunity to submit their names, contact details and comments on the</p> |

| TASK | DESCRIPTION |
|---|---|
| Notification - regulatory authorities and IAPs | |
| | project. |
| Newspaper Advertisements | <p>Block advertisements were placed as follows:</p> <ul style="list-style-type: none"> ◆ Die Republikein (10 and 17 March 2023) ◆ The Namibian Sun (10 and 17 March 2023) ◆ Allgemeine (10 and 17 March 2023) ◆ The Namib Times (10 and 17 March 2023) |
| Scoping Meetings | <p>Several consultations were made with I&APs. This included meetings and telephonic discussions.</p> <p>Meetings were held with key stakeholders as follows:</p> <ul style="list-style-type: none"> ◆ Date - Tuesday, 28 November 2023 ◆ Venue - The Orano Desalination Plant Conference Room ◆ Date - Friday, 01 December 2023 ◆ Venue - The New Erongo Regional Council Offices in Wlotzkasbaken <p>The due date to register as an I&AP and submit comments was from 10 November 2023 to 07 December 2023.</p> |
| Comments and Responses | Minutes and Issues and Response of the meetings were recorded. |
| MEFT review of ESIA Report and ESMP | A copy of the final Scoping Report, including authority and I&AP review comments, will be submitted to MEFT on completion of the public review process via the online application system. |

2.6 General Assumptions and Limitations

The key assumptions and limitations of this ESIA Report are detailed below.

- ◆ It is assumed that the information provided by Kaoko, relating to the project activities is accurate and that the project will be implemented and operated as described.
- ◆ The predictions of the impacts of the power cables on the marine environment need to be validated by regular field observations and subsequent monitoring.
- ◆ The results of specialist study formed the basis for the assessment of impact significance. The specialist investigations are conducted by an independent specialist considered to be experts in their fields. It was assumed that the information from these sources is relevant and accurate.

- ◆ Considering the dynamic nature of the marine environment and its susceptibility to the influence of climate change e.g. sea level rise, increases in frequency of wave storms, are not evidently considered in this study.
- ◆ Area is frequented by the Orano Desalination Plant activities, recreational fishers and off-road driving, as such the beach area is not pristine.

3 IDENTIFICATION OF APPLICABLE ENVIRONMENTAL AND SOCIAL GUIDELINES

3.1 Introduction

The Republic of Namibia has five tiers of law and several policies relevant to environmental assessment and protection, which include:

- ◆ The Constitution.
- ◆ Statutory law.
- ◆ Common law.
- ◆ Customary law.
- ◆ International law.

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

The management and regulation of the activities in the Namibian ocean fall within the jurisdiction of the Ministry of Fisheries and Marine resources. The environmental regulations are guided and implemented by the DEA within the MEFT.

In the context of the proposed project activities, there are several laws and policies currently applicable.

The Marine resources Act 27 of 2000 provides for the conservation of the marine ecosystem; the responsible utilisation, conservation, protection, promotion of marine resources in a sustainable manner and for the control of marine resources for these purposes. The Minister of Fisheries is empowered to make regulations under section 61 on a broad number of topics including “regulating or prohibiting the discharge in the sea or discarding on the seashore and land of specified substances or materials, or substances or materials not complying with specified requirements or having specified properties”

The EIA Policy (1995) is enforced through the Environmental Management Act, 7 of 2007 and the EIA Regulations of 6 January 2012 (EIA Regulations). In terms of this legal framework certain identified activities may not commence without an environmental clearance issued by MEFT.

3.2 Applicable Authorities

3.2.1 Ministry of Environment, Forestry and Tourism

The mission of the Ministry of Environment, Forestry and Tourism is to promote biodiversity conservation in the Namibian environment through the sustainable utilization of natural resources and tourism development for the maximum social and economic benefit of its citizens. MEFT develops, administers and enforces environmental legislation and policy.

The MEFT's Department of Environmental Affairs ("DEA") is mandated to give effect to Article 95L of the Constitution by promoting environmental sustainability. The Environmental Commissioner serves as head of the DEA. The DEA is responsible for, inter alia, the administration of the EIA process undertaken in terms of the Environmental Management Act, 2007 and the EIA Regulations 2012. The DEA will be responsible for issuing a decision on the application for an ECC, based on the recommendations from MFMR and MME. If approved, the DEA will issue an Environmental Clearance Certificate.

3.2.2 Ministry of Fisheries and Marine Resources (MFMR)

The Ministry of Fisheries and Marine Resources is responsible for the management and development of fisheries and aquaculture in Namibia. The Ministry is comprised of four directorates; two of which include the Directorate of Resource Management and Directorate of Operations and Surveillance. The Directorate of Resource Management is responsible for scientific research and providing advice on the state of commercially important marine fish stocks and recommending catch quotas. It is also responsible for managing and regulating species fish size limits, dates of closed fishing seasons, declaring areas closed to fishing and determining fishing gear use.

The Directorate of Operations and Surveillance is responsible for monitoring, controlling and surveillance of fishing-related activities both at sea and onshore.

The MFMR is a key stakeholder in the project and the ESIA process due to the proposed deployment of the WaveRoller technology (refer to Section 4). The WaveRoller technology has the potential to have both negative and positive impact on the marine ecology and the fishing industry.

3.2.3 Ministry of Mines and Energy (MME)

The MME comprises six directorates; one of which is the Directorate of Energy. The Directorate of Energy consists of 2 divisions:

- ◆ Electricity Division
- ◆ Renewable Energy Division

The Directorate of Energy enforces the compliance of legal requirements of energy legislation (Electricity Act, 2007) and regulations and researches new and renewable sources of energy. The National Integrated Resource Plan is a 20-year development plan for Namibia's Electricity Supply Industry, spanning the period between 2016 and 2035. The Directorate conducts functions such as:

- ◆ Implementation of Rural Electrification
- ◆ Implementation of Off-Grid Energisation Master Plan

The mandate of the Energy directorate is to ensure the adequate and affordable energy supply in a sustainable manner taking advantage of Namibia's natural resources in support of the nation's socioeconomic development. The MME is a key stakeholder in the project and the ESIA process due to the proposal for the deployment of the Wave Roller technology to generate electricity and feeding energy into the grid.

The Namibia Power Corporation (Pty) Ltd ("NamPower") is Namibia's national power utility, whose core business is the generation, transmission and energy trading and its mission is to provide for the energy needs of its customers. NamPower supplies bulk electricity to regional electricity distributors, mines, farms and local authorities throughout Namibia.

3.3 The Integrated Coastal Management Bill

Once enacted, the Integrated Coastal Management Bill (2014) aims to establish a system of integrated coastal management in Namibia in order to promote the conservation of the coastal environment, maintaining the natural attributes of the coastal landscapes and seascapes, and ensuring the sustainable development and use of the natural resources within the coastal zone that is also socially, economically and ecologically justifiable.

3.4 Coastal Strategic Environmental Assessments

Two Namibian coastal Strategic Environmental Assessments (SEAs) were undertaken between 2006 and 2008, i.e. one for the northern regions of Kunene and Erongo and another for the

southern regions of Karas and Hardap. These draw on international experience and were undertaken at a time of mounting production sector pressures within Namibia. Being an initiative of the Namibian Government through MEFT, the two SEAs seek to inform political and technical decision makers at local, regional and national levels.

The 2008 “SEA for the coastal areas of the Erongo and Kunene Regions” compiled by the Namibian Coast Conservation & Management Project (NACOMA) is aimed at ensuring informed decisions on issues related to biodiversity conservation, land use planning and socio-economic development planning in the Kunene and Erongo coastal regions.

3.5 Relevant Namibian Policies

Namibia’s policies provide the framework to the applicable legislation. Whilst policies do not often carry the same legal recognition as official statutes, policies are used in providing support to legal interpretation or guidance for civil servants and other stakeholders in the implementation of government objectives.

3.5.1 The Namibia Vision 2030

The principles that underpin Vision 2030 , a policy framework for Namibia’s long-term national development, comprise the following:

- ◆ Good governance;
- ◆ Partnership;
- ◆ Capacity enhancement;
- ◆ Comparative advantage;
- ◆ Sustainable development;
- ◆ Economic growth;
- ◆ National sovereignty and human integrity;
- ◆ Environment; and
- ◆ Peace and security.

Vision 2030 states that natural environments are disappearing quickly. Consequently, the solitude, silence and natural beauty that many areas in Namibia provide are becoming sought after commodities and must be regarded as valuable natural assets. Vision 2030 emphasises the importance of promoting healthy living which includes that the majority of Namibians are provided with safe drinking water. The importance of developing wealth, livelihood, and the

economy is also emphasized by Vision 2030. This includes infrastructure provision like transport, communication, water, and electricity.

3.5.2 The Harambee Prosperity Plan II

The Harambee Prosperity Plan II (HPPII) (covering the period 2021 - 2025) builds on the solid foundation of the inaugural HPP 2016 - 2020. It continues to prioritize the implementation of targeted policy programme in order to enhance service delivery, contribute to economic recovery and engender inclusive growth. HPPII aims to increase local electricity generation capacity from 624 MW (2020) to 879 MW by 2025.

3.6 Other Relevant Local Policies and Legislation

Below (Table 6) is a list of other applicable local policies and legislation for the proposed project.

Table 6: List of local policies and legislation

| Legislation | Summary | Environmental principles |
|--|---|--|
| Marine Resources Amendment Act no. 9 of 2015, Marine Resources Act 27 of 2000 | This act provides for the sovereign exercise of ownership by the State over marine resources; to amend the provisions relating to the total allowable catch and allocation of quotas | Principles of this act is to manage, protect, harvest and utilize marine resources in Namibia. |
| Marine Traffic Act (no. 2 of 1981) as Amended Namibian Ports Authority Act of 1991 | Ships may not be repaired within territorial sea or internal waters outside a harbor or fishing. No person shall sink a ship or dump ship wreck within territorial sea or internal waters outside a harbor or fishing. | Prevention of waste from ship repairs and ship wrecks. |
| Pollution Control and Waste Management Bill | This Act promote sustainable development; to provide for the establishment of a body corporate to be known as the Pollution Control and Waste Management Agency; 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 odor 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. | The environmental principle specific to this Bill is pollution control. |
| Territorial sea and exclusive economic zone of Namibia Act 3 of 1990 | This Act determines and defines the territorial sea, internal waters, contiguous zone, exclusive economic zone and continental shelf of Namibia and to | Minimize the exploitation of natural resources of the sea. |

| | | |
|---|--|---|
| | provide matters incidental thereto. | |
| Walvis Bay and Offshore Islands Act 1 of 1994 | An Act to make provision for the smooth transfer of control over Walvis Bay and the offshore islands from the Republic of South Africa to the Republic of Namibia effective as of 1 March 1994. | Provide provision for governance; fishing authorization, fishery management and conservation. |
| Namibia Ports Authority Act 2 of 1994 | To provide for the establishment of the Namibia Ports Authority to undertake the management control of ports and lighthouse in Namibia and the provision of facilities and services related thereto. | To manage and exercise control over the operation of ports and lighthouse and other navigational aids in Namibia and its territorial waters. |
| Aquaculture Act 18 of 2002 | This Act regulate and control aquaculture activities; to provide for the sustainable development of aquaculture resources; and to provide for related matters. | Environmental principles of this act are to promote sustainable aquaculture; management, protection and conservation of marine and onshore aquatic ecosystems. |
| Animal Health Act 1 of 2011 | This Act predominantly deals with <i>prevention, monitoring</i> and <i>control</i> of animal diseases in order to protect public health but it also has other provisions (such as trade) that not relevant to the environment. | To prevent and control animal diseases in public and environment |
| Urban and Regional Planning Act no. 5 of 2018 | This Act consolidate the laws relating to urban and regional planning; to provide for a legal framework for spatial planning in Namibia; to provide for principles and standards of spatial planning. | Environmental principles specific to this act are: harmonization and streamlining of spatial planning in order to avoid land use conflicts, delays in decision making and to minimize negative environmental impacts. |
| Atmospheric Pollution Prevention Ordinance 11 of 1976 | To provide for the prevention of the pollution of the atmosphere | To prevent atmospheric pollution and minimize environmental impacts associated with it. |
| Water Resources Management Act 11 of 2013 | To provide for the management, protection, development, use and conservation of water resources; to provide for the regulation and monitoring of water services and to provide for incidental matters. | Manage water resources, prevent water pollution and control water storage and provision. |
| Public and Environmental Health Act 1 of 2015 | To provide a framework for a structured uniform public and environmental health system in Namibia. | Principles of this act includes protecting individuals and communities from public health risks, encourage community participation in order to create a healthy environment; and provide for early detection of diseases and public health risks. |

| | | |
|--------------------------------|---|---|
| National Climate Change Policy | This policy identifies technology development and transfer to be a key issue for which strategies and action plans should be developed. | Promote and encourage new and clean technologies to be developed in order to reduce greenhouse gas emissions. |
|--------------------------------|---|---|

3.7 Relevant International Standards

3.7.1 The EIB’s Statement of Environmental and Social Principles and Standards (EIB, 2009)

The European Investment Bank (EIB) adopted an Environmental Statement in 1996 to underline its commitment to protecting and improving the natural and built environment according to EU policy (EIB, 209). The statement focuses on, a) the principles on which the EIB approach to environmental and social issues are based and b) the environmental and social performance standards that ensure compliance with Bank requirements. The principles and standards are derived from EU policy and law and supplemented by other examples of international good practice. The EIB requires that all the projects it is financing are acceptable in environmental and social terms by applying appropriate safeguards to all its operations.

3.7.2 The EIB’s Environmental and Social Handbook (EIB, 2013)

The EIB Environmental and Social Handbook provides an operational translation of the policies and principles contained in the 2009 EIB Statement of Environmental and Social Principles and Standards (see above). Principles include the Environmental and Social Impact Assessment process of identifying predicting, evaluating a project’s positive and negative environmental and social impact on the biophysical and human environment as well as identifying ways of avoiding, minimizing, mitigating and compensating, including offsetting in the case of the environment and remedying in the case of social impacts, by applying the mitigation hierarchy. This process includes consultation with direct and indirect stakeholders and the elaboration of an environmental and social management plan detailing the implementation of the mitigation measures.

3.7.3 World Bank Environmental and Social Framework

The World Bank’s Environmental and Social Framework (ESF) enables the World Bank and Borrowers to better manage environmental and social risks of projects and to improve development outcomes. The ESF offers broad and systematic coverage of environmental and social risks. It makes important advances in areas such as transparency, non-discrimination,

public participation, and accountability - including expanded roles for grievance mechanisms. It brings the World Bank's environmental and social protections into closer harmony with those of other development institutions.

The ESF consists of:

- ◆ The World Bank's Vision for Sustainable Development.
- ◆ The World Bank's Environmental and Social Policy for Investment Project Financing (IPF) which sets out the requirements that apply to the Bank.
- ◆ The 10 Environmental and Social Standards (ESS), which set out the requirements that apply to Borrowers.
- ◆ Bank Directive: Environmental and Social Directive for Investment Project Financing
- ◆ Bank Directive on Addressing Risks and Impacts on Disadvantaged or Vulnerable Individuals or Groups.

3.7.4 World Bank's Pollution Prevention and Abatement Handbook (PPAH)

The Pollution Prevention and Abatement Handbook (PPAH) promotes the concepts of sustainable development by focusing attention on the benefits, both environmental and economic, of pollution prevention, including cleaner production and good management techniques. In many cases, the guidelines provide numerical targets for reducing pollution, as well as maximum emissions levels that are normally achievable through a combination of cleaner production and end-of-pipe treatment. The guidelines are designed to protect human health, reduce mass loading to the environment, draw on commercially proven technologies, be cost effective, follow current regulatory trends and promote good industrial practices, which offer greater productivity and increased energy efficiency.

3.7.5 Applicable International Finance Corporation (IFC) Performance Standards

IFC's Environmental and Social Performance Standards define IFC clients' responsibilities for managing their environmental and social risks. The Performance Standards provide guidance on how to identify sustainability risks and impacts and are designed to help avoid, mitigate, and manage them as a way of doing business in a more sustainable way.

The following are the performance standards that are applicable to the construction and operation of the project and are used as the basis of investigation for the ESMP:

Table 7: Applicable Performance Standards

| IFC Performance Standard | Description | Applicable | Not Applicable |
|---|---|-------------------------------------|-------------------------------------|
| 1. Environmental and Social Management System | An environmental and social management system (ESMS) helps companies integrate plans and standards into their core operations—so they can anticipate environmental and social risks posed by their business activities and avoid, minimize, and compensate for such impacts as necessary. A good management system provides for consultation with stakeholders and a means for complaints from workers and local communities to be addressed. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 2. Labour and Working Conditions | It asks that companies treat their workers fairly, provide safe and healthy working conditions, avoid the use of child or forced labor, and identify risks in their primary supply chain. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 3. Pollution Prevention and Control | It guides companies to integrate practices and technologies that promote energy efficiency, use resources—including energy and water—sustainably, and reduce greenhouse gas emissions. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 4. Occupational Health and Safety, Public Health and Security | It helps companies adopt responsible practices to reduce such risks including through emergency preparedness and response, security force management, and design safety measures. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 5. Land Acquisition and Involuntary Resettlement | It advises companies to avoid involuntary resettlement wherever possible and to minimize its impact on those displaced through mitigation measures such as fair compensation and improvements to and living conditions. Active community engagement throughout the process is essential. | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
| 6. Biodiversity and Ecosystems | It recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and managing living natural resources adequately are fundamental to sustainable development. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

| | | | |
|--|--|-------------------------------------|--------------------------|
| 7. Rights and Interests of Indigenous People | It seeks to ensure that business activities minimize negative impacts, foster respect for human rights, dignity and culture of indigenous populations, and promote development benefits in culturally appropriate ways. Informed consultation and participation with IPs throughout the project process is a core requirement and may include Free, Prior and Informed Consent under certain circumstances. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| 8. Cultural Heritage | Cultural heritage encompasses properties and sites of archaeological, historical, cultural, artistic, and religious significance. It also refers to unique environmental features and cultural knowledge, as well as intangible forms of culture embodying traditional lifestyles that should be preserved for current and future generations. PS8 aims to guide companies in protecting cultural heritage from adverse impacts of project activities and supporting its preservation. It also promotes the equitable sharing of benefits from the use of cultural heritage. | <input checked="" type="checkbox"/> | <input type="checkbox"/> |

3.8 International Conventions and Agreements

Below (Table 8) is a list of applicable international conventions and agreements for the proposed project.

Table 8: International conventions and agreements

| Legislation | Summary | Environmental principles |
|---|---|--|
| 2011 Guidelines for the Control and Management of Ship's Biofouling to minimize the Transfer of invasive Aquatic Species. | These guidelines are intended to provide a globally consistent approach to the management of biofouling organisms, which could present a bio-risk in local ports. | Prevent the transfer of invasive species and coordinating a timely and effective response to invasions which requires cooperation and collaboration among governments. |
| Stockholm Convention on Persistent Organic Pollution (2001) | Is a global treaty to protect human health and the environment from chemicals | To protect human health and the environment from persistent organic pollutants; especially those used in |

| | | |
|--|---|---|
| | that remain intact in the environment for longer periods. | marine paints. |
| Vienna Convention for the protection of ozone layer (1985) | This Convention is aimed to promote cooperation among nations by exchanging information on the effects of human activities on the ozone layer. | To take control actions to protect the ozone layer. |
| Montreal protocol (1997) | Is a global agreement to protect the earth's ozone layer by phasing out the chemicals that depletes it. | Control substances and chemicals production that are depleting the ozone layer. |
| UN Framework on climate change (1992) | This framework was introduced to stabilize greenhouse gas concentrations at a level that would prevent dangerous anthropogenic interference with the climate system. | Countries should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. |
| Kyoto protocol (1997) | It is also designed to assist countries in adapting to the adverse of climate change. It facilitates the development and deployment of technologies that can help increase resilience to the impacts of climate change. | Reduce GHG emission at least by 18%. |
| Basel Convention (1992) | To protect human health and the environment against the adverse effects of hazardous wastes. | Reduction of hazardous waste generation and the promotion of environmentally sound management of hazardous wastes |
| Conventions on Wetland of International Importance (1971) | Conserving wetlands (swamps, marshes, lakes, mudflats, peat bogs and other bodies of water whether natural or artificial, permanent or temporary). | This convention establishes a management framework aimed at conserving the wetland and ensuring its wise use. The Walvis Bay is recognized under this convention. |

| | | |
|---|---|---|
| Paris Agreement (2015) | Is a legally binding international treaty on climate change. | To limit global warming to preferably 1.5 degrees Celsius, compared to pre-industrial levels. |
| United Nations Convention on Law of the Sea of 1982. | It's a legal framework for marine and maritime activities. It lays down a comprehensive regime of law and order in the world's oceans and seas establishing rules governing all uses of the oceans and their resources. | It provides that coastal States have sovereign rights in a 200-nautical mile Exclusive Economic Zone (EEZ) with respect to natural resources and certain economic activities, and exercise jurisdiction over marine science research and environmental protection. |
| International Convention for the Control of and Management of Ships' Ballast Water and Sediments of 2004. | This Convention seeks to prevent the spread of harmful aquatic organisms from one region to another, by the establishment of standards and procedures for the management and control of ships' ballast water and sediments. | Protect the oceans from invasive aquatic species |
| International Convention for the Prevention of Pollution from Ships (MARPOL) and the protocol of 1978. | This convention is aimed at the prevention of pollution from ships caused by operational or accidental causes. | Prevention of pollution by sewage, oil and garbage from ships in the sea; Prevention of air pollution from ships; prevent pollution by Harmful Substances carried at sea in packaged form. |
| International Convention of the Safety of life at Sea of 1974 (SOLAS). | SOLAS is an international maritime treaty which sets minimum safety standards in the construction, equipment and operation of merchant ships. | Convention allows for flag states to compel ships under their flags to comply with safety requirements including fire-fighting equipment and nuclear containment facilities in order to prevent impacts associated with risks of transportation of dangerous goods. |
| Convention on the Prevention of Marine Pollution by dumping of wastes and other matters, 1972 (as amended by the protocol | This convention protects the marine environment from human activities such as | Take practicable steps to prevent pollution of the sea, promote the effective control of all sources of |

| | | |
|--|--|--|
| of 1996). | pollution. | marine environment caused by dumping at sea; (black and grey list). |
| International Convention on Oil Pollution Preparedness, Response and Co-operation of 1990 (OPRC Convention) with its Protocol of 2000 (OPRC-HNS Protocol). | Convention was developed by the International Maritime Organization (IMO) to further prevent pollution from ships and it requires coastal states to prepare and response to oil spills risks. | Convention compels states to carry onboard oil pollution emergency plan in order to effectively respond to oil pollution incidents. |
| Nairobi International Convention on removal of wrecks (18 May 2007). | The Convention provides a set of uniform international rules aimed at ensuring the prompt and effective removal of wrecks located beyond the territorial sea. The Convention also includes an optional clause enabling States Parties to apply certain provisions to their territory, including their territorial sea. | It provides a sound legal basis for coastal states to remove wrecks which pose a hazard to the safety of navigation as well as the marine and coastal environments. |
| Internal Convention on Biological Diversity | Among others, this Convention aims at conservation of biological diversity and promote sustainable development of biological components. | Conservation of biological diversity, sustainable use and equitable sharing of utilization of biodiversity, ecosystem assessment and monitoring and mitigation of adverse environmental impacts. |
| International Convention on the Control of Harmful Anti-fouling Systems on Ships (2001) | The convention prohibits the use of harmful organotin in anti-fouling paints used and establishes a mechanism to prevent the potential future use of other harmful substances in anti-fouling systems. | It is preferable to minimize the accumulation of biofouling on vessels and movable structures. |

3.8.1 Applicable Listed Activities

The EIA Regulations promulgated in terms of the Environmental Management Act, identify certain activities which could have a substantially detrimental effect on the environment. These listed activities require environmental clearance from MEFT prior to commencing. The following listed activities (Table 9) identified in the regulations apply to the proposed project:

Table 9: Listed activities triggered by the proposed Project.

| Listed activity |
|---|
| 1. Energy generation, transmission and storage activities |
| 1.1 The construction of facilities for - (a) the generation of electricity; (b) the transmission and supply of electricity. |

4 Project description

4.1 Introduction

As mentioned in Section 1.2, Kaoko intends to apply for an Environmental Clearance Certificate (ECC) for its proposed installation of 5 Power Transmission Cables to transmit electricity from offshore where WaveRollers are proposed to be deployed, to the NamPower grid located onshore (Figure 1). The proposed development is located north of Wlotzkasbaken settlement, Erongo Region, Namibia.

The proposed power cables will cover a linear distance of approximately 300 - 500 m offshore to the coastline and installed on the seabed. It will further cover an approximately 1.7 km of underground installation from the shoreline to the NamPower substation located onshore.

4.2 Power Cable Specification

The specification of the WaveRoller Device are indicated in Table 11 below.

Table 11: Power Cable Specification

| Specification | |
|-------------------|---|
| Power Cable Type | Rubber cable with excellent chemical, thermal and mechanical resistance (4 x 10 mm ²) |
| Cable Protection | The cables are protected with a rubber hose. |
| Subsea Connectors | High power and Ethernet circular |

4.3 Power Cable Installation Phase

4.3.1 Power Transmission Supply

The power cables will be 1.75-kilometre transmission cables, that will commence approximately 300 - 500 m offshore, where WaveRollers will be deployed, and terminate onshore at an existing NamPower substation.

4.3.2 Installation

The installation working areas include the following:

- ◆ mobile stores for storing the installation materials;
- ◆ temporary lay-down areas;
- ◆ mobile waste collection and storage areas;
- ◆ temporary parking area for cars and equipment;

- ◆ toilets facilities (preferably chemical toilets) that will be serviced regularly.

4.3.3 Transport and Traffic

The installation traffic, inland, will use the C34 Swakopmund - Henties Bay public road, and existing off-roads currently used by fishermen and Orano. Vehicles used for the installation phase will include trucks for moving materials and 4x4 vehicles for workers. Daily traffic will vary depending on the stages of construction but there will be a minimum of 4 vehicles a day.

Vessels and divers will be used for the installation of the cables on the seabed until the shoreline.

The power cables will intersect the C34 Swakopmund - Henties Bay public road and traffic will potentially be disturbed during that period.

4.3.4 Topsoil Management

Digging and drilling will be used to make trenches for the power cables. The topsoil removed will be placed back to fill and close up the trenches that will be created.

4.3.5 Employment and housing

The installation will be carried out by a combination of Kaoko employees and contractors. Contractors for the installation phase will be engaged on a short term, temporary basis. The installation workforce/contractors will commute to the designated sites each day during the installation phase and will be accommodated in Swakopmund and the various communities close to the project site. No accommodation or any permanent structures will be constructed on site.

4.3.6 Power Supply for Installation Activities

Small, mobile generators will supply power for the installation phase onshore. No power supply is required for the installation offshore.

4.3.7 Sanitation during Installation

Chemical toilets with associated septic tanks (preferred) or toilets connect to French Drain systems will be used. The septic tanks will be emptied on a regular basis and the effluent disposed of at a licensed facility off-site.

4.3.8 Waste Management during Installation

The pilot project will make use of waste bins during the installation phase. These waste bins should be emptied on a regular and waste to be transported to the nearest approved waste disposal site in Henties Bay or Swakopmund.

4.4 Power Transmission Cables Operational phase

4.4.1 Site facilities for operation

The operational phase will consist of the following:

- The new transmission cables.
- The transmission cables will be connected to the NamPower substation to supply power.

4.4.2 Operation Phase Activities

The main activities will include routine inspections and maintenance as required.

4.4.3 Employment and Housing

The proposed power cables will not generate any operational employment or housing demand.

4.4.4 Operational transport

Other than the need for routine inspections and maintenance which will use the existing service track, the power cables will not generate operational traffic.

4.4.5 Power Supply for operation activities

None required.

4.4.6 Waste Management for the Operation Phase

None required.

4.4.7 Time table

Installation commencement is subject to regulatory approval, i.e. approval of the ESIA and issuing of an ECC by MEFT.

4.5 Decommissioning

At the end of the WaveRoller operations, the site including all linear infrastructure will be decommissioned and suitably rehabilitated. Where possible, rehabilitation will be undertaken progressively during operation as areas become available. This approach will allow the operational team to determine the best and most effective method of rehabilitation for the various areas disturbed by Project activities.

5 PROJECT ALTERNATIVES

5.1 Alternative Power Transmission Cable Route

The proposed route was determined is clear of drainage lines, lichens and less vegetated as compared to other areas in the vicinity, therefore making the route the most suitable for the installation of the power cables. Therefore, the selected route will likely have minor impacts on the surrounding fauna and flora.

Other alternatives, include installing the cables parallel to the existing Orano pipeline, however, the areas along the pipeline is reserved and earmarked for Orano's developmental activities.

5.2 The "no project" option

As mentioned in section 4.3.1 above, the objective of the project is to provide power supply to the NamPower grid. The project will ultimately benefit the Namibian power grid and so contribute to Namibia's power demands for the future.

Therefore, proceeding with the installation of the proposed power cables, will have benefits at the local, regional and national scale, which will result in the boosting on the Namibian power grid and a significant positive economic impacts such as employment and procurement of goods and services. Not implementing the project will impact the commencement and deployment of the WaveRoller project, hence, impacting the overall financial feasibility of the Project.

Therefore, the challenge facing the project proponent is its contribution towards achieving these goals while at the same time preventing and/or mitigating potential negative social and environmental impacts. The proponent will have to ensure that the identified mitigation measures and commitments to address the potential impacts, will appropriately be implemented and adhered to.

6 DESCRIPTION OF THE CURRENT ENVIRONMENT

This section was compiled utilising the following sources of information:

- ◆ Information shared by Kaoko Green Energy Solutions (Pty) Ltd.
- ◆ Visual observations during a site visit by I.N.K.
- ◆ Specialist investigations (Hydrogeology, Vegetation).
- ◆ Google Earth.
- ◆ Atlas of Namibia.
- ◆ Internet sources.

6.1 Marine/Offshore Baseline

6.1.1 Benguela Upwelling

Namibia's ocean space is part of a unique natural marine environment, the Benguela Current Large Marine Ecosystem (BCLME), which is considered as one of the most productive marine regions of the world's oceans. It boasts high biological productivity with abundant zooplankton, phytoplankton, important fisheries, and healthy top predator populations such as the Cape fur seals. Namibia's marine environment is controlled by the seasonal changes in the south Atlantic high-pressure system, bringing southerly winds throughout the year, albeit stronger in winter and spring.

The project site is located in NWCRA and BCLME (Benguela Current Large Marine Ecosystem); mainly influenced by the cold Benguela Current Upwelling System. The BCLME is driven by southerly winds, which induces transportation of deep cold and nutrient-rich waters near the coast. Among others, several physical factors that play a critical role during the upwelling process are Carbon Dioxide (CO₂), SSTs (Sea Surface Temperatures), DO (Dissolved Oxygen), sun radiation and nutrients. When describing the central BCLME based on SSTs and DO; generally, the ecosystem appears to display low mean annual SSTs and low DO throughout the year, with upwelling at its maximum during winter.

Although the project is located in this ecosystem, the current predominantly flows in deeper water. The Lüderitz Upwelling Cell is far to the south and the project site is far from the most important and sensitive areas in the south; i.e. Mercury Island, Ichaboe Island, Halifax Island and Possession Island.

6.1.2 Activities in the Area

The Orano Desalination Plant and its associated linear infrastructure (pipelines) is one of the key activities and it is located approximately 1 km south of the proposed pilot study area.

Other activities include, recreational angling, which is an activity in the central coast primarily from Swakopmund to Henties Bay, targeting species such as Silver Kob, Blacktail, Galjoen and West Coast Steenbras Figure 5. Life forms such as dense stands of foliose and fruticose lichens occur in this area. Wlotzkasbasken, a small settlement between North of Swakopmund and south of Henties Bay is not exempt from the aforementioned activities. Silver Kob is the main recreational fish species of importance on the vicinity of the proposed pilot area. The Wlotzkasbasken area is an important spawning site for Silver Kob (Figure 6). Anglers can cast their fishing lines at a distance of approximately 100 m from the shoreline, while the devices are proposed to be located at a distance of between 200 m - 500 m from the shoreline. This distance between the two activities will prevent the interference of the the WaveRoller activities on fishing activities.

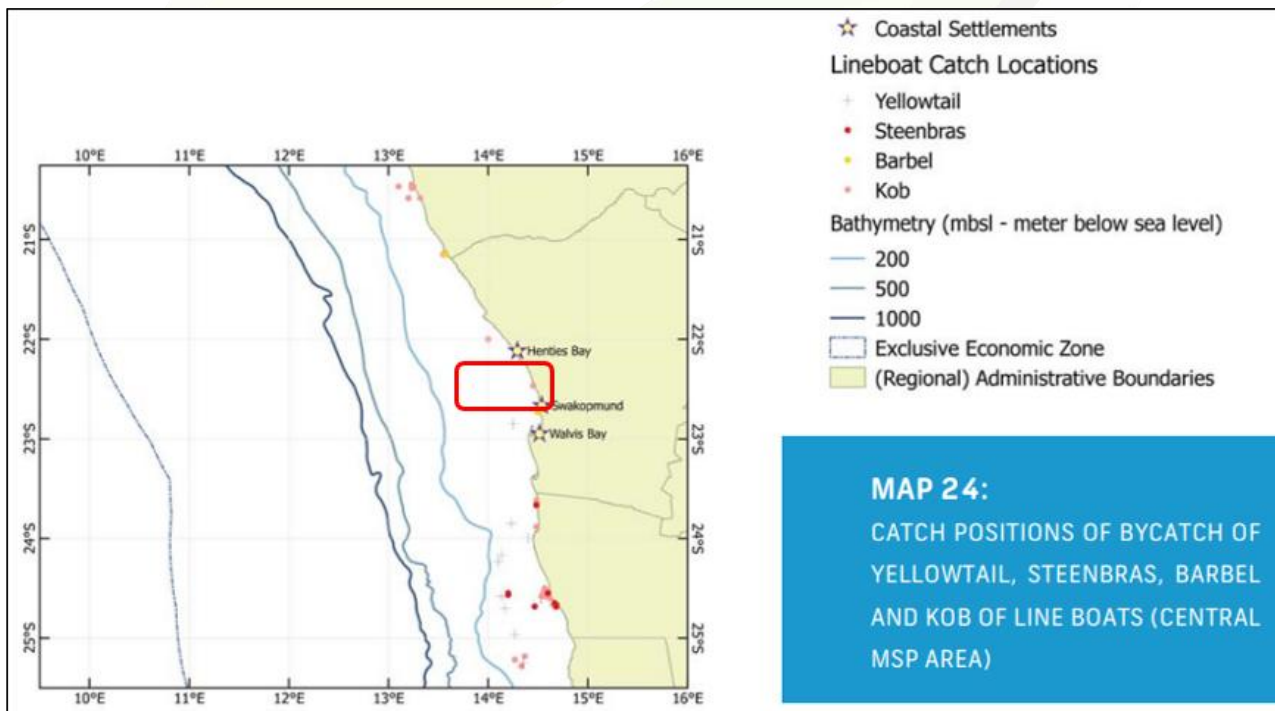


Figure 4: Map showing catch positions for recreational fish species in vicinity of pilot area

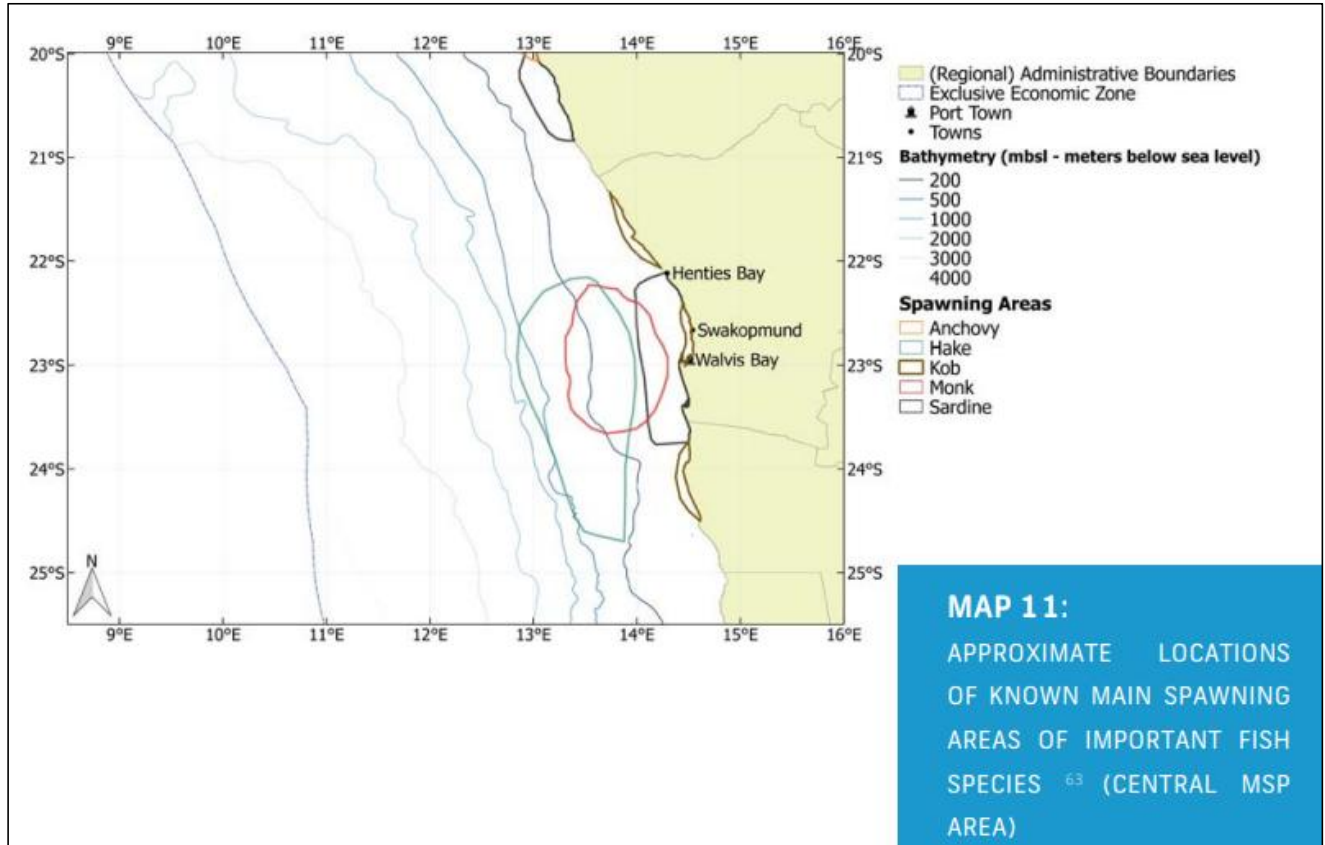


Figure 5: Known spawning locations for fish species in the central coast of Namibia

6.1.3 Sea Surface Temperatures and salinity

Based on historical data, **Figure 7** shows the average seawater temperatures for the general Wlotzkasbasken area. The measurements for the water temperature are provided by the daily satellite readings provided by the NOAA. The temperatures given are the sea surface temperature (SST) which is most relevant. The average warm and cold sea surface temperatures in the area are 19.1°C in February, and 13.6°C in August respectively. A high seasonality is displayed by these temperature variations. Salinities range between 34.5‰ and 35.5‰ are observed for the area.

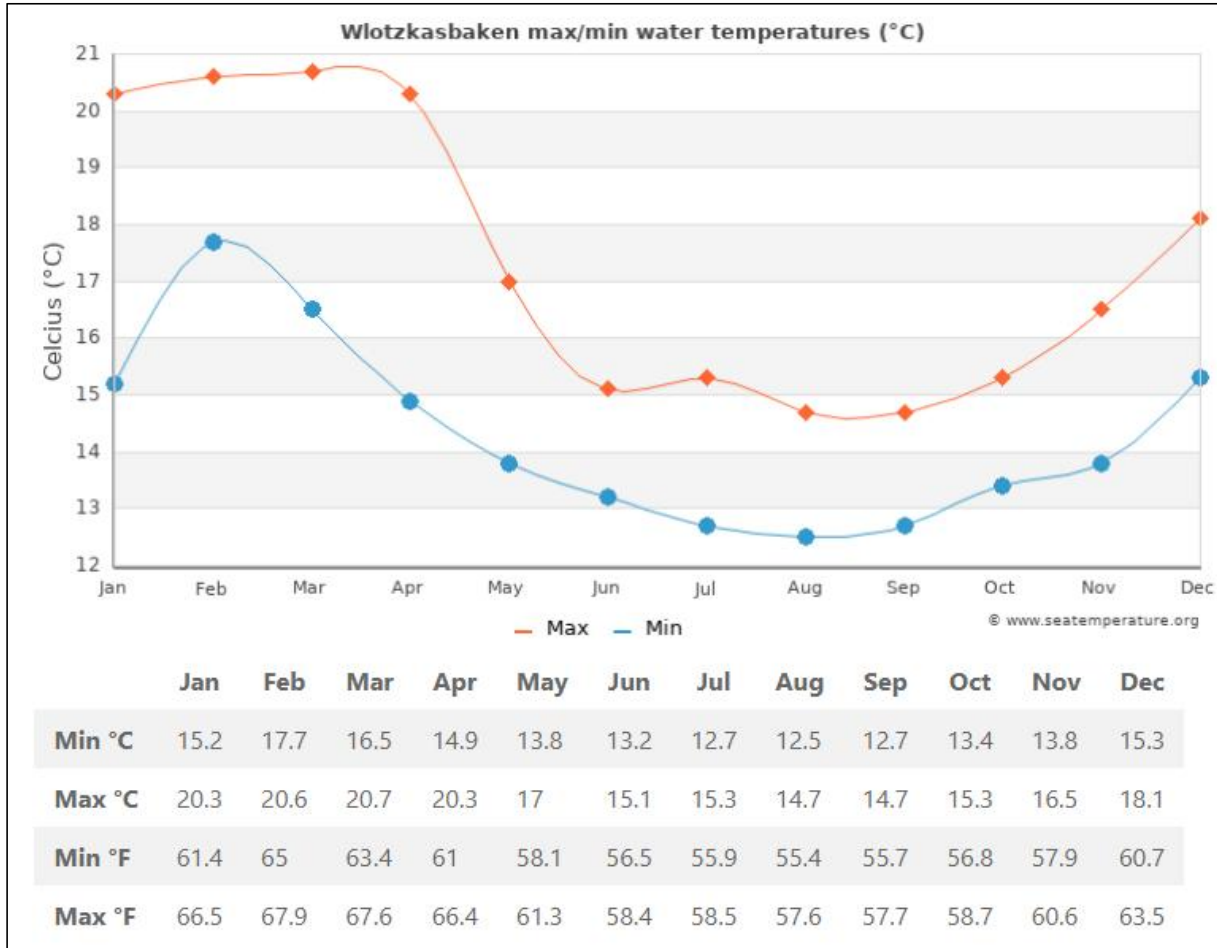


Figure 6: Min/Max water SST at Wlotzkasbaken, source: SeaTemperature.org

6.1.4 Dissolved Oxygen (DO) concentration and nutrients

After upwelling, dissolved inorganic nutrients are converted into organic nutrients and through photosynthesis, oxygen is released. Literally, waters associated with upwelling are supposed to be rich in DO. However, this is not the case for the Namibian shelf. Anoxicity is a common feature in the northern BCLME and has a peak in summer between January and March annually. It accounts for huge losses of crustaceans and pelagic fish species. Water with concentrations below 2 ml/l is considered oxygen deficient while water below 5 ml/l are oxygen depleted. Concentrations <0.5 ml/l are recorded in the BCLME near 15°S. The continental shelf waters of the Benguela system are characterized by low oxygen concentrations, especially on the bottom. Nutrient concentrations of upwelled water of the Benguela system attain 20 µM nitrate-nitrogen, 1.5 µM phosphate and 15-20 µM silicate, which indicate typical nutrient enrichment.

6.1.5 Phytoplankton fauna

Phytoplankton fauna are well found in the specific pilot study area. Phytoplankton is important because it forms a basis of the productivity of the marine environment. Additionally, they play a key role as sinks of excess atmospheric carbon dioxide released from heavy fuel diesel systems used as fuel in vessels. Phytoplankton has a higher potential for reduction of atmospheric carbon and mitigation of air pollution. Moreover, through the photosynthesis process, phytoplankton release oxygen which is essential for respiration by marine organisms. There are phytoplankton species that are toxic to humans when ingested through consumption of shellfish. Harmful phytoplankton species are associated with HABs (harmful algae blooms). The season for HABs is from July to October with a peak in August. Eutrophication is a main contributing factor to HABs and is caused by several natural factors such as intense upwelling activity, but anthropogenic factors such as river run-off, sewage discharge and others may also contribute. Higher upwelling in the BCLME mainly accounts for HABs when nutrient-rich waters are transported near the coast and in the euphotic zone. It is postulated that HABs could also be induced by anthropogenic activities; however, this has not been scientifically proven.

6.1.6 Benthic Fauna

Marine sediments form one of the largest habitats on earth by covering more than 80% of the ocean floor. In spite of high size variations of the benthos, the benthic biomass is dominated by the macrofaunal invertebrates (>0.5 mm), including many species of polychaetas, crustaceans, mollusks and echinoderms. Amongst the benthic communities, the macrofauna is the community that includes invertebrates that are retained on a 0.5 mm sieve. The main taxa that comprise the macrofauna are the phyla: Arthropoda (mainly crustaceans of the malacostraca group), Mollusca (mainly bivalves and gastropods) and Annelida (mainly polychaetas). Macrofauna has been widely used as indicators of pollution in marine environments.

In addition to importance as indicator of anthropogenic impacts, macrofauna plays a major role in ecosystem functions such as organic matter mineralization and nutrient recycling. Primarily, the bacteria inhabiting the seabed carry out these tasks, but macrofauna enhances them through active biological transport, i.e. bioturbation (active mixing of sediment) and bio-irrigation (active flushing of solutes). These processes produce an increase in the supply of oxygen and other electron acceptors of the seabed surface with the porewater. This increases the metabolic capacity of bacteria and, in turn, of the sediment, to mineralize organic matter and recycle nutrients. Benthic fauna have reduced mobility compared with other groups of species such as

fish, marine mammals, and marine birds and so, they tend to remain on the site after the impact has occurred.

6.1.7 Topography and sediments

Figure 8 shows the typical seafloor geomorphic features of the Namibian coastal seafloor. This depicts that of the proposed pilot area.

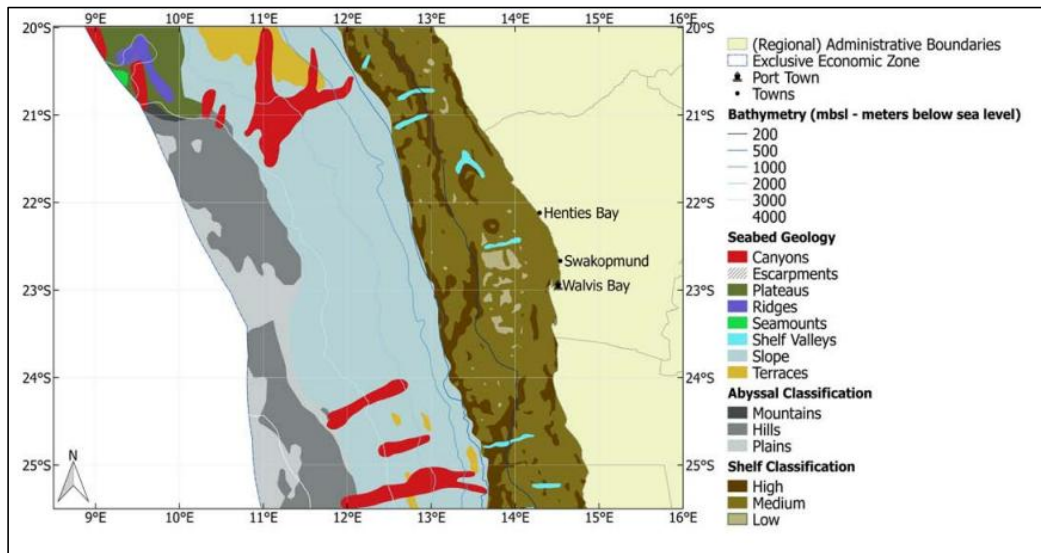
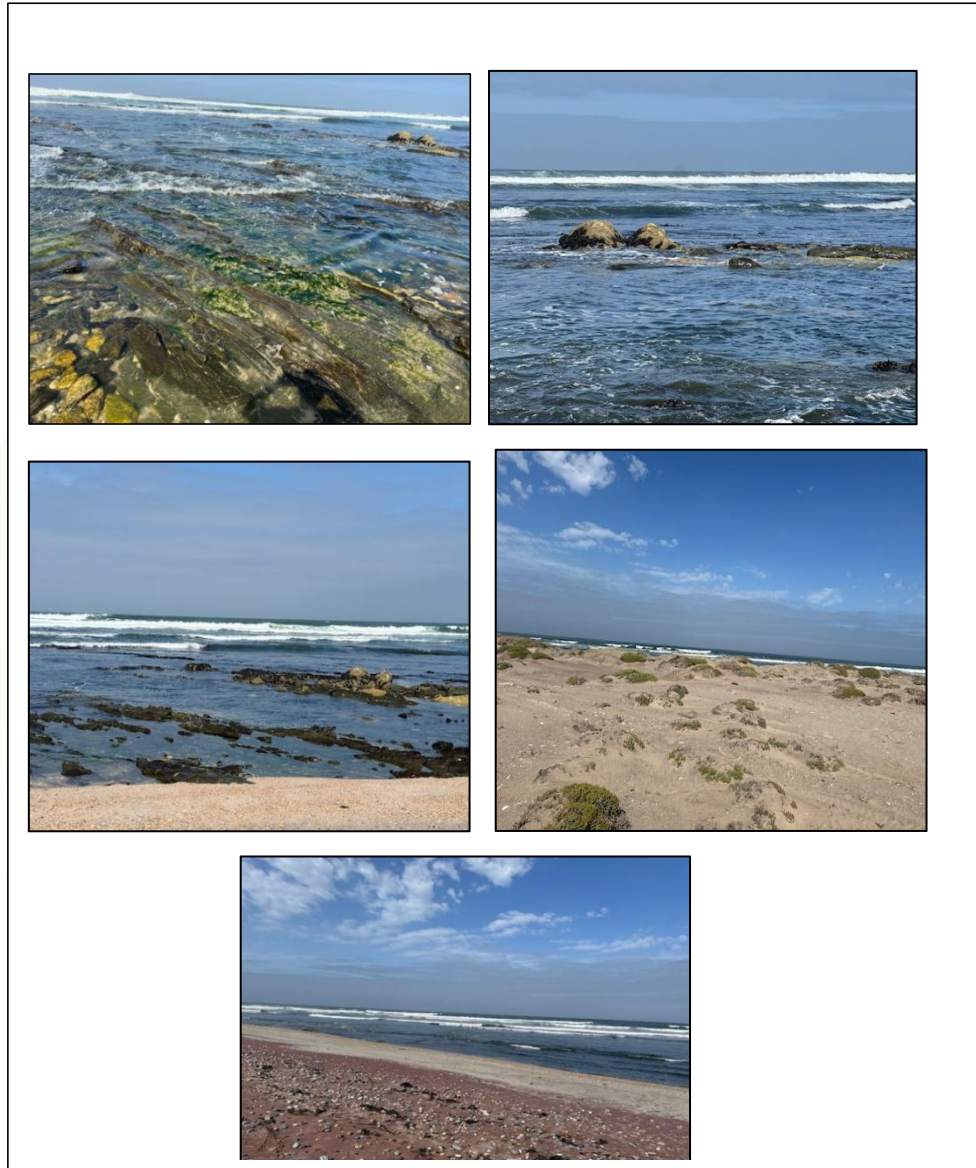


Figure 7: Seafloor geomorphic features. Source: MFMR 2018

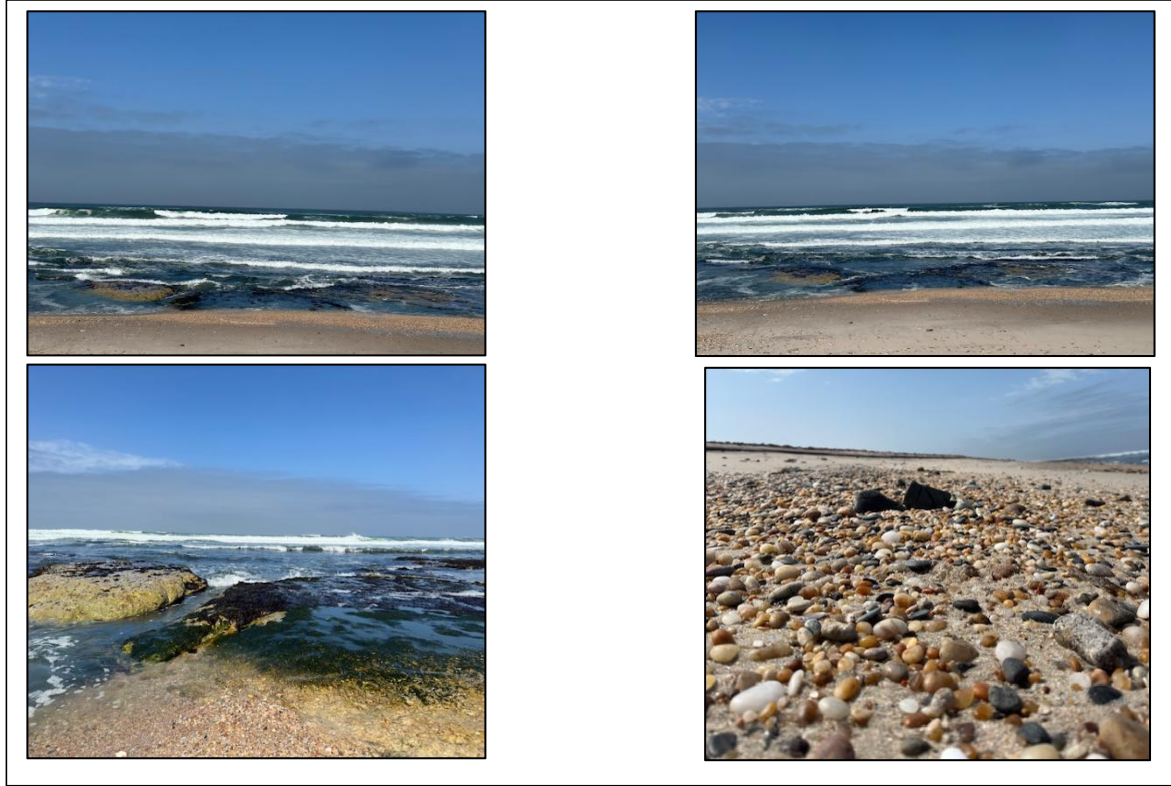
The images taken during the beach survey, show the topography of the selected pilot area. Generally, the peripheral sediments in the intertidal and low-shore areas are generally dominated by moderately to well-sorted fine to medium sand with median particle sizes of 200-400 μm . Northwards, in the vicinity of the proposed pilot area, the sediments become coarser and contain proportions of gravel and pebbles, with extensive pebble beds in the mid- and low-shore, especially station 3. Beyond the low water mark inshore, the pilot area has rock outcrops, running along the seafloor appearing as the dominant topography in the pilot area. Existing information suggests a rock plate sloping very gently into the intertidal area.

The rock surface appears rough in some areas and smooth on others with a micro relief of approximately 0.5–1.0 m. Literature indicate that that offshore, about 200m, the seabed comprises smooth, flat bedrock with sparse patches of sand. Additionally, the area is characterized by small, shallow gullies of 0.5 – 1 m wide and 0.3 m deep orientated perpendicular to the coast. The general characterization of the topography along the Namibian coast, comprises of few rocky outcrops (16%) and intertidal reefs that characterize the coast, covered in seaweed, and marine invertebrate epi-fauna such as but not limited to barnacles,

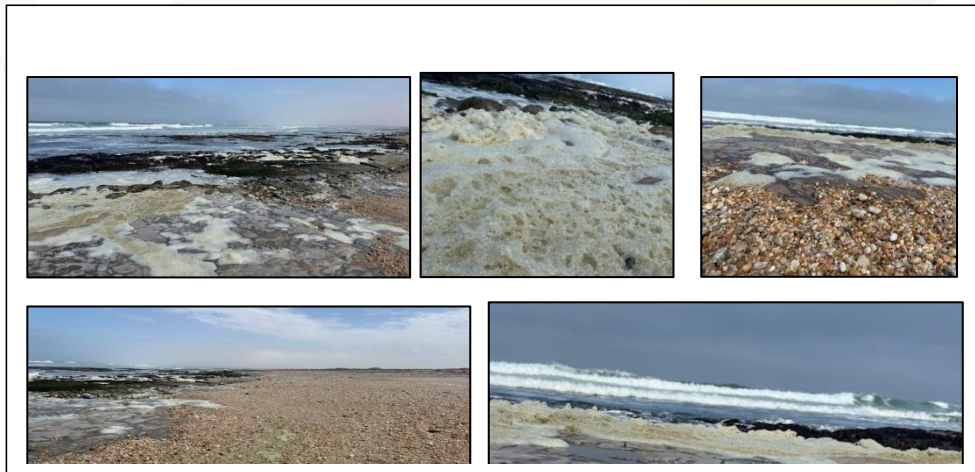
limpets, black mussels and sea anemones, whilst the sandy escarpments (which makes up 58% of the coastal shore environment) are home to infauna e.g. amphipods, polychaetas etc. The bottom sediments of up to 2km offshore, constitute clean coarse-grained sand and shells, with water depths increasing at a distance of 10 -15 km from the shore.



Photos 1-5: Topography of pilot area (Station 1)



Photos 6-9: Topography of pilot area (Station 2) Photo 10: Topography of pilot area (Station 3)



Photos 10-14: Topography of pilot area (Station 2) Photo 10: Topography of pilot area (Station 4)

6.2 Inland/Onshore Baseline

6.2.1 Climate

The meteorological conditions along the Namibian coast are controlled by the ever-present South Atlantic anticyclone, the northward-flowing Benguela Current (with associated upwelling) and the divergence of the south-east trade winds along the coast. Climatic conditions in the region vary from cool, foggy, windy and hyper-arid conditions along the coast to dry and hot weather towards onshore from which is separated by the Great Escarpment.

6.2.2 Temperature, Rainfall and Fog

Namibia is a hot country with temperatures along the coast being relatively constant, but fluctuating

daily and seasonally in the interior. The coastal area around Swakopmund receives less than 50 mm of rainfall per annum, but approximately a third of the year are characterised as fog days (Figure 6-2). Fog is the most distinctive climatic feature Namibia's coast, with 100-125 days of fog per year in the vicinity of Swakopmund . Fog usually forms when moist maritime air moves over cold upwelled water adjacent to the coast and is the predominant source of precipitation for the coastal areas.

Many plants and animals rely on the fog in these areas as water source and is an important driver of the establishment and growth of lichens. Average rainfall increases and fog days decrease towards the east . Heavy rainfall in the interior of the country rarely reaches the sea, except as occasional floods in the Omaruru, Swakop and Kuiseb rivers. Evaporation rates in Namibia are generally high, however lower rates of evaporation are experienced at the coast due to cooler and more humid coastal conditions.

6.2.3 Surface Wind

The presence of the subtropical South Atlantic Anticyclone off Namibia's coast drives the wind pattern, generating strong to gale force south-westerly winds along the coast in all seasons but most frequently during mid-summer and spring. These strong winds cause upwelling in the ocean, bringing nutrient rich water to the surface and consequently resulting in the high biological productivity characteristic of Namibian coastal waters. Additionally, the coastal southwesterly wind is responsible for transporting sand to the Namib Sand Sea. Occasional hot, dry and powerful easterly winds ("Berg Winds") during winter cause large quantities of dust and

sand to be blown offshore, affecting sediment input into the coastal marine environment. The abrasive effect of the sand and dust transported by Berg winds is an important consideration in the design of power lines and other infrastructures. Wind in the interior blows mainly from north, north-east and easterly directions (Figure 6-3), and carries moist air into Namibia.

6.2.4 Topography

The coastal plain of Namibia rises towards the east and forms a plateau of between 900 and 1 300 metres above sea level (m.a.s.l). The incisions of the ephemeral Khan- and Swakop rivers can be observed between Usakos and Swakopmund, and Otjimbingwe and Swakopmund respectively. Windhoek is situated at approximately 1 700 m.a.s.l.

6.2.5 Geology, Soils and Land Cover

Schists and dolomites, with patches of granite and complex rock types, predominantly underlie the proposed project area. The eastern part around Windhoek is characterised by schists. The dominant soil types of the proposed project area are petric Gypsisols, petric Calsisols, eutric Regosols, and lithic and eutric Leptosols, with interspersed rocky outcrops. The desert areas of the proposed project area is sparsely covered with lichen and vegetation.

6.2.6 Surface Water and groundwater

Although the surface water features in the study area are not of particular significance for aquatic ecology, dry rivers and drainage lines act as resource sinks that attract and provide habitat for plants and animals. Dry rivers and drainage lines channel water during rains, often characterised by flash floods, and play a critical role in the landscape in terms of transporting water and nutrients downstream. Drainage lines and other surface water features are thus of significance for terrestrial biodiversity and ecology. In Namibia, where surface water is very sparse, groundwater is a critical resource. Little or no groundwater exists between the coast and ~ 15°15'E, hollower groundwater areas are often associated with surface water features (ephemeral rivers and dry rivers).

6.2.7 Lichen Fields

Lichens are composite soil-inhabiting organisms that form biological soil crusts together with other organism groups (e.g. cyanobacteria and bryophytes). They play a crucial role in semi-arid ecosystems, since they are able to retain soil moisture, reduce wind and water erosion of the soil (soil stability), reduce deflation (i.e. loosened materials), fix atmospheric nitrogen

(cyanolichens), and contribute to soil organic matter and nutrient richness. Additionally lichens are a food source for beetles and provide shelter for the nests of the vulnerable endemic Damara Tern when breeding (Barnard, 1998). Large lichen fields in the proposed project area are of global biodiversity significance, and include the lichen community north of Wlotzkasbaken.

6.2.8 The Coastal Hummock Belt

The coastal hummock belt refers to a narrow stretch of area from the high water mark, directly inland from the littoral zone. The inland site hosts the primary vegetation species which are very distinct and dominated by *Arthraerua leubnitziae*, *Zygophyllum clavatum*, *Brownanthus kuntzei* and *Zygophyllum stapffii*. The vegetation assessment noted that in the area of the proposed development, severe degradation of this belt is noted due to anthropogenic activities. However, patches of pristine habitat remain. A similar trend is noted along the rest of the Namibian coast (which hosts this habitat), as recreational activities and related access roads fragment the habitat, isolating endemic hummock invertebrates, thereby reducing their ranges, interrupting gene flow and diminishing their ability to adapt and survive into the future. The assessment notes that this habitat, as a whole, should be considered very sensitive and very vulnerable.

6.2.9 Socio-Economic

The nearest settlement is Wlotzkasbaken, situated about halfway between Henties Bay and Swakopmund on the C34 road. It was founded as a holiday angling spot in the 1930s, but the erven have not been electrified and water is delivered by road and stored in private water towers that characterise the settlement's skyline. There are no walls or fences anywhere; boundaries are demarcated with rocks. In 2000, the Erongo Regional Council expanded the total number of erven to 248 and existing leaseholders were offered the option to buy the piece of land they had rented before and built on. The current Erongo Desalination Plant, built to supply the Areva Trekoppie mine with water, is located on the outskirts of the settlement and adjacent to the proposed project site..

7 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS

The scoping phase which included a consultation process with key stakeholders that included government authorities and I&APs allowed the opportunity to raise the issues associated with the project development.

The relevance of the potential impacts (“screening”) are also presented in the tables below to determine aspects to be assessed in further detail (Section 8 of this report).



Table 15: Environmental Aspects and Potential Impacts

| ASPECT | APPLICABLE PHASE | POTENTIAL ENVIRONMENTAL IMPACT | RELEVANCE (SCREENING) OF POTENTIAL IMPACT |
|---|--|---|---|
| Accidental oil spills from vehicles, vessel operations | Installation, Operational and Decommissioning Phases | Potential impact on water resources and water quality | <p>With reference to section 8.3.3, the installation traffic, inland, will use the C34 Swakopmund - Henties Bay public road, and existing off-roads currently used by fishermen and Orano. Vehicles used for the installation phase will include trucks for moving materials and 4x4 vehicles for workers. Daily traffic will vary depending on the stages of construction but there will be a minimum of 4 vehicles a day. Vessels and divers will be used for the installation of the cables on the seabed until the shoreline.</p> <p>These vessels have the potential to affect the environment as a result of oil spillages. However, this is deemed to be minimal.</p> <p>The maintenance crew to undertake monitoring and servicing, will be transported to site via vessels and vehicles. These vessels have the potential to affect the environment as a result of oil spillages. However, this is deemed to be minimal.</p> <p>Therefore, no further assessment was required. The hydrocarbons management and mitigation measures are stipulated in the ESMP.</p> |
| Archaeology | Installation and Operational | Impact on archaeology sites | <p>There's no evidence of archaeological remains in the area. Therefore, no impacts are expected for this issue. No further assessment is required.</p> <p>However, should there be any archaeological findings on site, the related management and mitigation measures stipulated in the ESMP should be followed.</p> |
| Noise generated during the installation of the power cables | Installation and Decommissioning Phase | Impact on marine ecology and nearest sensitive receptors (inland) | <p>The study area is commonly known to consist of various fish species that include, Silver Kob, Blacktail, Galjoen and West Coast Steenbra. In addition, phytoplankton such as algae blooms and benthic fauna are well found in the pilot study area. The installation and decommissioning phases are likely to affect the above mentioned species due to the human movements. However, considering the small scale activities, noise during installation is deemed to be minimal.</p> <p>The installation following the inland route of the power cable is expected to be minimal due to existing noise from vehicles on the C34 road, Orano operations and fishermen in the area. Therefore, this is deemed to be minimal.</p> <p>No further assessment was required. The noise management and mitigation measures are stipulated in the ESMP.</p> |
| Visual | Installation and Operations | Changes in visual conditions. | <p>The power cables are proposed to be installed underground. Therefore no visual impacts are expected.</p> <p>No further assessment was required. The visual management and</p> |

| | | | |
|--------------|--------------|---|--|
| | | | mitigation measures are stipulated in the ESMP. |
| Biodiversity | Installation | Potential impacts on Lichens and the coastal hummock belt species in the area | Lichens and species of the hummock belt can be found along the route of the power cables. The activities during the inland installation of the power cables which includes human movements, digging and drilling may have an impact on the local fauna and flora. Therefore, the potential impact on the inland fauna and flora has been assessed further in section 8. |
| Dust | Installation | Potential impacts as a result of the creation of trenches for the power cables. | With reference to section 8.3.4, Digging and drilling will be used to make trenches for the power cables. The topsoil removed will be placed back to fill and close up the trenches that will be created. These activities may create dust, however, considering that it is small scale, this is deemed to be minimal. |
| Traffic | Installation | Intersection of the C34 Public Road | The power cable route will intersect the C34 Swakopmund - Henties Bay public road. Traffic will temporarily be disturbed on the public road during that period. The project will notify, liaise and obtain the relevant authorization from Roads Authority, prior the installation activities. However, traffic flow disturbance will likely only take place for 1 -2 days and therefore minimal. No further assessment was required. The traffic management and mitigation measures are stipulated in the ESMP. |

8 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

8.1 Assessment Approach and Methodology

The assessment largely adopted a desktop approach, where qualitative information on the environment was collected during a site visit and a beach survey conducted on 01 December 2023. The extent of the impacts and assessment ratings are not quantified over the larger project area.

The site visit and beach survey collected sediment for grain size analysis, wave data entailing the height and frequency, as well as sediment samples for invertebrates. Counts of avifauna and marine flora were also taken into consideration. No exploratory dives and sediment grab sampling were carried out in deeper water of the proposed location. This approach is deemed adequate for placing into context the potential impacts associated with the establishment of the proposed installation for this pilot project.

An assessment of the potential positive and negative impacts associated with the installation and operations phase of the proposed pilot project is provided below. As an outcome of the Scoping Phase, specialist input was requested for some of the environmental issues and has been included in this assessment.

Other potential environmental impacts resulting from the proposed project activities and facilities (also identified during the Scoping Phase of the ESIA) were assessed by I.N.K and are also presented below.

Impacts are considered in a cumulative manner where possible such that the impacts of the proposed Project are seen in the context of the baseline conditions described in Section 6. Information that has been included in Section 6 will not be repeated in this Section.

- ◆ Both the criteria used to assess the impacts and the Method of determining the frequency/severity of the impacts is outlined.

Table 16. This Method complies with the EIA Regulations: EMA, 2007 (Government Gazette No. 4878) EIA regulations. Both mitigated and unmitigated scenarios are considered for each impact in the ESIA results.

The potential impacts that required further assessment include the following:

- ◆ Potential Impacts on the Marine Ecology.
- ◆ Potential Impacts on the Lichens and Coastal Hummock Belt Species

Table 16: Frequency/Severity Rating

| Likelihood/ Frequency | Definition | Probability | Rating | Consequence/ Severity | | | | |
|--------------------------|---|-------------|--------|-----------------------------|---|--|--------------------------|----------------------------|
| | | | | Insignificant | Minor | Moderate | Major | Critical |
| | | | | Very minor or no impact. | Minor impact that can be contained | Impact may have moderate effects | Serious impact/effect | Permanent Impact/effect |
| | | | | 1 | 2 | 3 | 4 | 5 |
| Very high | Almost certain Extremely likely | >90% | 5 | Low | Medium | High | Extreme | Extreme |
| | | | | 5 | 10 | 15 | 20 | 25 |
| High | Very likely Will probably occur | 60-90% | 4 | Low | Medium | Medium | High | Extreme |
| | | | | 4 | 8 | 12 | 16 | 20 |
| Medium | Likely to happen | 40-59% | 3 | Low | Low | Medium | Medium | High |
| | | | | 3 | 6 | 9 | 12 | 15 |
| Low | Possible but unlikely | 10-39% | 2 | Low | Low | Low | Medium | Medium |
| | | | | 2 | 4 | 6 | 8 | 10 |
| Very low | Conceivable but extremely unlikely | <10% | 1 | Low | Low | Low | Low | Low |
| | | | | 1 | 2 | 3 | 2 | 2 |

8.2 Impact: Introduction of artificial hard substratum due to power cable installation

The presence and laying of power cables is unavoidable. However, artificial hard substratum may act as habitat for opportunistic organisms such as mussels, barnacles and other attaching marine organisms. These structures function as fish aggregating devices or artificial reefs, attracting fish and other mobile organisms to the biofouling organisms as a source of food and to the structures as sources of protection, refuge, and shade. However, this could potentially alter species distributions and abundance, habitat connectivity, and biodiversity. The proponent should use marine environment approved coating to prevent growth and introduction of potential marine fouling organisms (mainly invertebrates and algae) that can be a nuisance in the marine environment.

Table 18: Introduction of artificial hard substratum due to power cable installation

| Likelihood | Definition | Probability | Rating | Severity | |
|------------|----------------------------------|-------------|--------|-------------|------------|
| | | | | unmitigated | Mitigated |
| High | Very likely, will probably occur | 85% | 4 | Medium (12) | Medium (8) |

8.3 Impact: Disturbance of spawning and migratory route for Silver kob during installation

During summer months, adult Silver Kob migrate southwards along the central Namibian coast, from Skeleton Coast National to Sandwich harbour, passing the Wlotzkasbasken area. The spawning period is protracted over 6 months (October-March), which coincides with warmer water temperatures (>15 °C) and the occurrence of large-sized spawning Silver Kob in the southern and central part of Namibia. It would be advisable to avoid high activity during the spawning season (October to March).

Table 20: Disturbance of spawning and migratory route for Silver kob

| Likelihood | Definition | Probability | Rating | Severity | |
|------------|----------------------------------|-------------|--------|-------------|-------------|
| | | | | unmitigated | Mitigated |
| High | Very likely, will probably occur | 80% | 4 | High (16) | Medium (12) |

8.4 Potential Impact on Lichens and Coastal Hummock Belt during inland installation

Inland installation related activities presents the greatest risk to habitats within the area. Destruction and or disturbance of sensitive areas such as the lichen fields and coastal hummock belt (which lies within the proposed development), will impact the localised ecosystem, especially during the installation and trenching. Installation activities can create habitat for flora species to establish e.g. disturbed soil is favourable for the establishment of weeds and invader species. Illegal collection of plant materials may occur. Employees should not be allowed to harvest kelp or forage for washed-up kelp from the site or from the areas adjacent to it.

Table 22: Potential Impact on Lichens and Coastal Hummock Belt during inland installation

| Likelihood | Definition | Probability | Rating | Severity | |
|------------|------------------|-------------|--------|-------------|-----------|
| | | | | Unmitigated | Mitigated |
| Medium | Likely to happen | 40-58% | 4 | Medium (9) | Low (6) |

9 CONCLUSIONS AND RECOMMENDATIONS

It was concluded from the assessment that the installation of the power transmission cables has minimal impacts on the overall marine ecology and inland biodiversity due to its small scale activities. The potential marine impacts may arise from the human activities during installation, which could disturb the marine flora, while, the inland impacts may arise from the drilling and creation of trenches which could disturb the fauna and flora.

However, the mitigation measures that have been identified and recommended by I.N.K will promote the positive impacts of the project, as well as reduce the negative impacts to acceptable levels. An ESMP was further developed which identifies potential impacts of the project during the installation and operation phases. The ESMP is a legally binding document to which Kaoko must adhere to.

Despite these impacts, I.N.K concludes that the Proponent should be allowed to undertake the proposed installation of power transmission cables, provided the potential impacts in the ESMP are mitigated.

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