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# CLEANERGY POWER GRID CONNECTION PROJECT WALVIS BAYDRAFT ENVIRONMENTAL SCOPING REPORT

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# EXECUTIVE SUMMARY

Cleanergy Solutions Namibia is leading the development of a green hydrogen production pilot plant in Walvis Bay, Namibia (Cleanergy Site: Figure i). This demonstration hub comprises of hydrogen production, a refuelling station and a training centre. The Environmental Assessment Report, provides further details of the project available at: https://www.cleanergynamibia.com/downloads.


*Figure i: Locality of the Cleanergy Grid Connection Project, Walvis Bay*

The development needs a 5,3 km 11kV power line, which triggers an application for an Environmental Clearance Certificate (ECC), according to the Environmental Management Regulations of Namibia (2012). Enviro Dynamics is managing this process on behalf of Cleanergy Solutions and this Draft Scoping Report contains the findings of this process so far.

It is believed that this project is necessary and desirable for the economic benefit of developing the green hydrogen industry in Namibia. The consultant is satisfied that all possible alternatives have been selected to avoid environmental and social impacts.

The potential impacts identified and assessed for this proposed 5.3km 11kV power line south of Farm 58, Walvis Bay, are listed in Table i below. Corrosion and wind-blown sand is known to create maintenance challenges for infrastructure along the Namibian Coast. This matter can be addressed by the engineering team to some extent, but remains a reality in the project area. The other impacts listed are all rated low or of no significance if mitigation is applied.

During operations, monitoring will be required to detect possible bird electrocutions and collisions, as prescribed in the EMP. All other mitigation measures are also detailed there (Appendix D).

It is recommended that an ECC be issued for this project, subject to the implementation of the EMP.

*Table i: Impacts assessed and ratings after mitigation*

| POTENTIAL IMPACT | IMPACT RATING AFTER MITIGATION |
|---|---|
| Soil pollution particularly during construction. | None |
| Windblown sand during construction, with increased vehicular movement, construction activities etc. | Low |
| Loss of biodiversity through removal of plants (very limited to *salsola and other hummock vegetation only* in isolated cases) and life on the plains during construction. | Low |
| Employment creation during construction and operation. | Low |
| Health and safety compromised during construction and operation, associated with exposure to electrical currents, heights, general construction safety aspects. | Low |
| Visual impact during construction and operation | Low |
| Access restrictions, conflict with other infrastructure corridors. | Low |
| Sustainability of project due to high maintenance (wind and corrosion effects). | Medium to Low |
| Bird electrocutions on power line infrastructure | None |
| Bird collisions on power line infrastructure | Low to None |

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| *ASL* | *Above Sea Level* |
| *EIA* | Environmental Impact Assessment |
| *EIS* | Environmental Information Systems |
| *EMA* | Environmental Management Act |
| *EMP* | Environmental Management Plan |
| *ErongoRED* | Erongo Regional Electricity distributor Company (Pty) Ltd |
| HLPCD | Horizontal Line Post Compact Delta |
| *IUCN* | International Union for Conservation of Nature |
| *KM* | Kilometre |
| *KV* | KiloVolt |
| MEFT | Ministry of Environment, Forestry and Tourism |
| *NamWater* | Namibia Water Corporation |
| *QDS* | Quarter Degree Square |

# 1 INTRODUCTION

## 1.1 BACKGROUND

Cleanergy Solutions Namibia is leading the development of a green hydrogen production pilot plant in Walvis Bay, Namibia (Cleanergy Site: *Figure ii*) . This demonstration hub comprises of hydrogen production, a refuelling station and a training centre. The Environmental Assessment Report, provides further details of the project available at: https://www.cleanergynamibia.com/downloads. An ECC was issued for the construction and operation of the demonstration plant and will be administered separately from this component of the project.

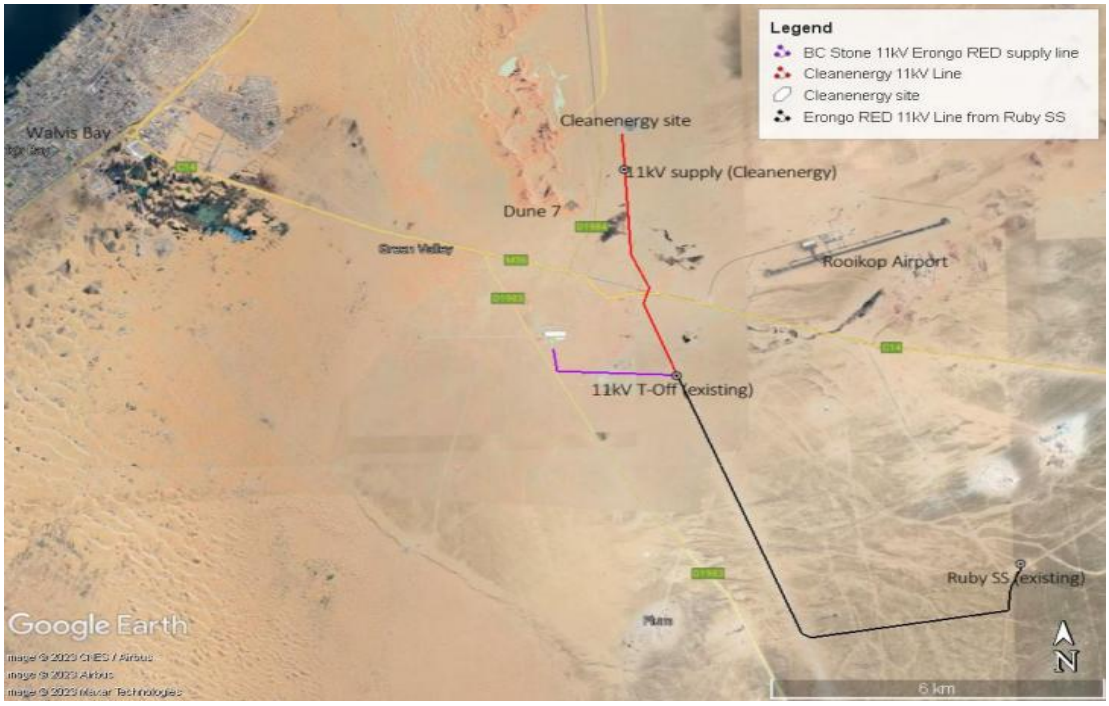


*Figure ii Locality of the proposed Cleanergy site and grid connection route.*

The development needs to be connected to the electricity grid for power supply. The infrastructure required for this connection, particularly the proposed 5,3 km 11kV power line, also requires an Environmental Impact Assessment with resulting Environmental Clearance Certificate (ECC), according to the Environmental Management Regulations of Namibia (2012).

Cleanergy appointed Enviro Dynamics to conduct the necessary environmental assessment process and apply for the ECC (Environmental Clearance Certificate) at the Directorate of Environmental Affairs (DEA) in the Ministry of Environment, Forestry and Tourism (MEFT) on their behalf.

This document reports on the findings of the Environmental Impact Assessment process undertaken in order to meet the requirements of the mentioned regulations.

## 1.2 LEGAL REQUIREMENTS AND SCOPE OF WORK

The following text appears in the Environmental Regulations (2012), under the schedule with listed activities which trigger the need for an ECC:

"1. The construction of facilities for -
(b) the transmission and supply of electricity;"

Therefore the construction of this proposed 11kV power line, the details as discussed under Section 2, require an ECC.

The main steps undertaken in order to apply for an ECC, are as follows:

1. Compile a project description (Section 2).
2. Undertake a legal review, listing all applicable environmental related legislation and permitting requirements (Section 3).
3. Conduct appropriate stakeholder consultation process (Section 4 and Appendix A).
4. Describe the pertinent environmental and social baseline conditions that may be affected by the project (Section 5 and Appendix B, Bird Impact Assessment).
5. Conduct an impact assessment of the main activities that may affect the environmental and social environment (Section 6).
6. Compile a report with the findings of the study, in order to fulfill the requirements of the Regulations (this Scoping Report).
7. Apply on the MEFT Website portal for the ECC, submit the report with its appendices as required on the portal, and follow up the application process, until the ECC is issued.

These steps are reported on in this report, under the mentioned sections.

Stephanie van Zyl is the key Environmental Assessment Practitioner (EAP) responsible for this EIA process. Her CV is attached as Appendix C. She is assisted by Norman van Zyl (EAP) and Ecoserve (Bird specialists).

# 2 DETAILS OF THE PROPOSED POWER LINE

## 2.1 PROPOSED ROUTE

*Figure 1* shows the proposed route of the power line (red line), from the Cleanergy site southeast of Dune 7, on Farm 58, to run in a southeasterly direction, crossing the existing C14 Road and connecting with the existing 11kV T-off and ErongoRED power line (purple line). The route follows the new freeway and 132kV transmission line corridor, an existing NamWater pipeline route and an existing ErongoRED line which will be upgraded and replaced (*Figure 2*).

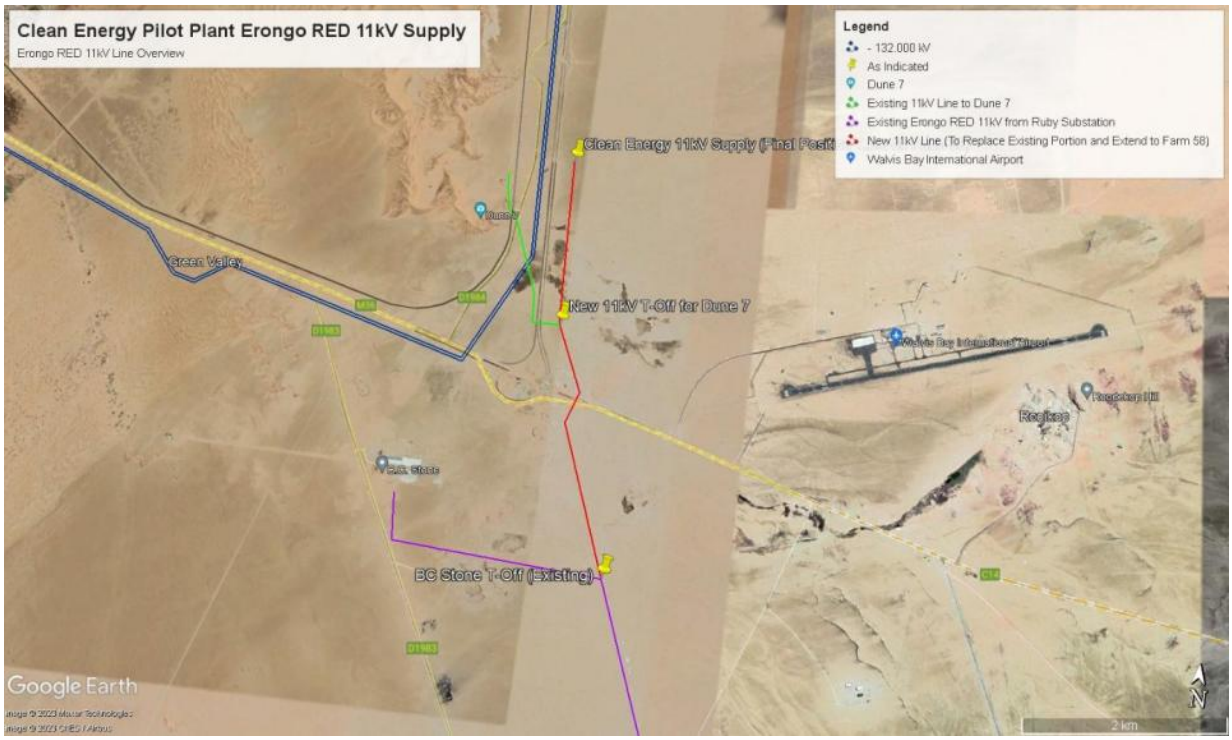


*Figure iii: Proposed Route details of New 11kV supply line to Cleanergy Site*

## 2.2 STRUCTURES

Cleanergy intends to use either the HLPCD (Horizontal Line Post Compact Delta) or A-Frame Structure for the power line (*Figures 3-7*). The final selection of either one of these two structures will be made during the detailed design stage.

## 2.3 CONSTRUCTION PERIOD

The construction period for this line will be approximately one month, Commencement is planned for the third quarter of 2023, or as soon as the ECC has been rewarded.

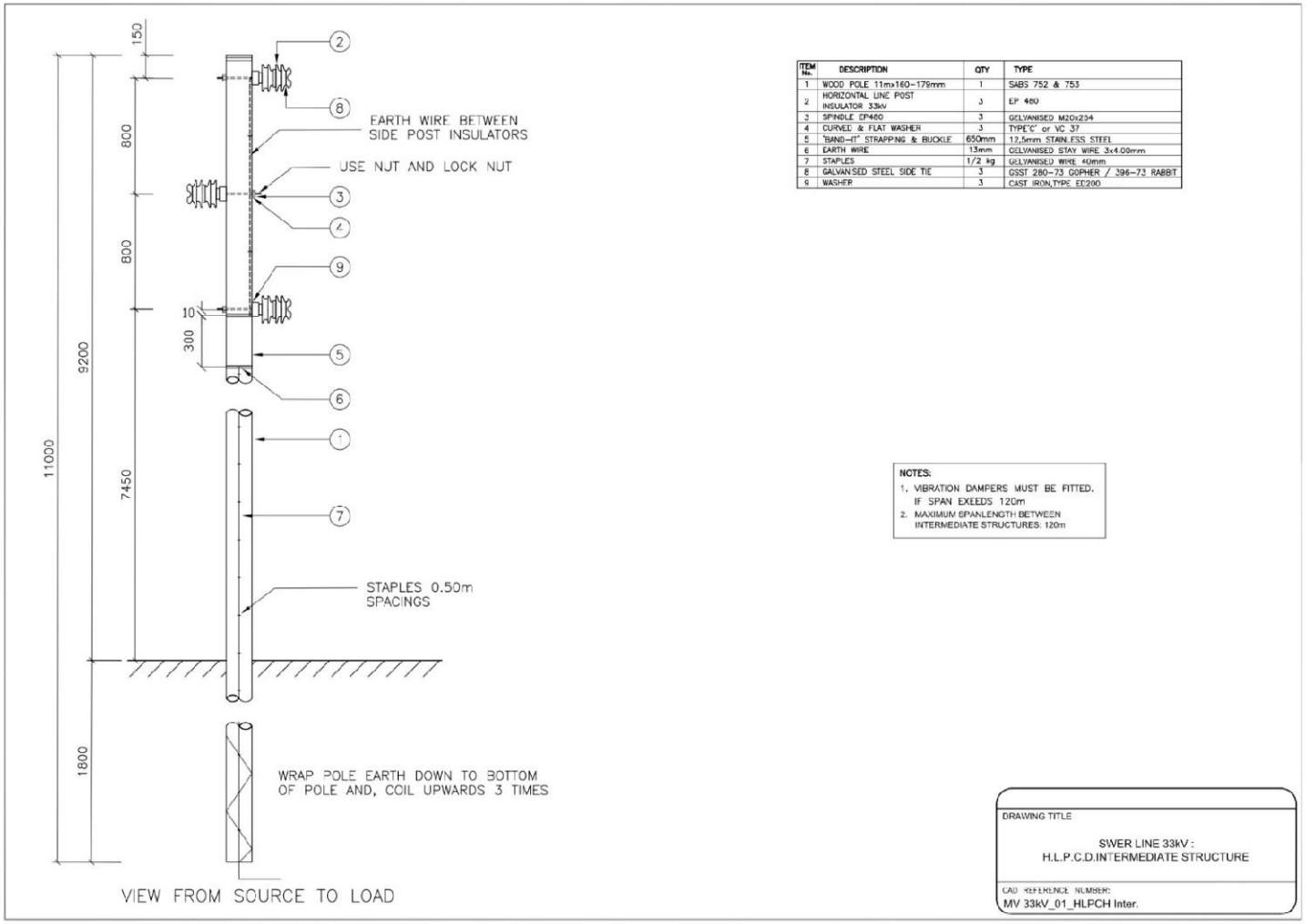


*Figure iv: Details of proposed intermediate structures (alternative HLPCD Structures)*

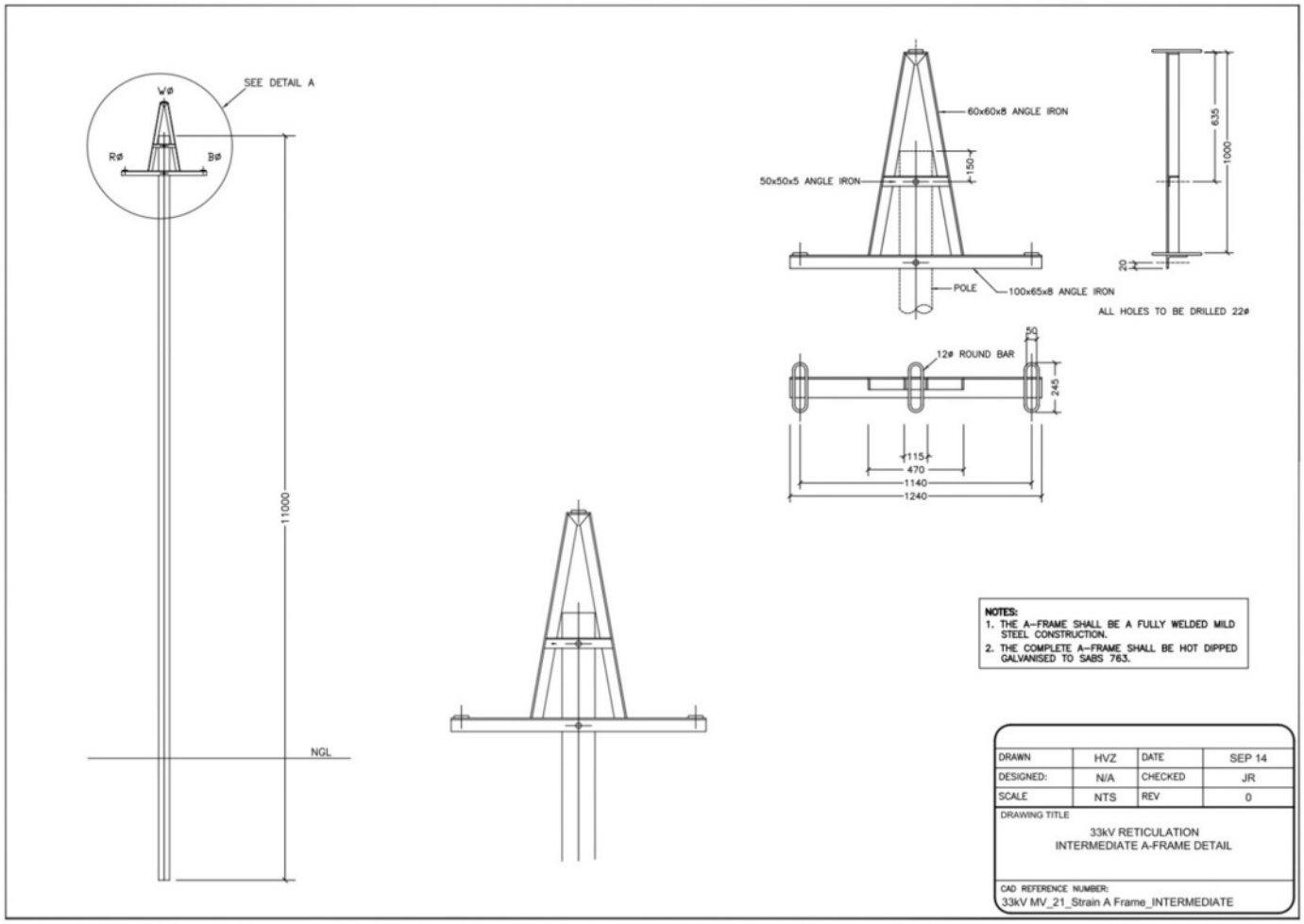


*Figure v: Details of proposed intermediate structures (alternative A-Frame Structures)*

*Figure vi: Typical A-frame structure*


*Figure vii: Typical HLPCD Structure*

*Figure viii: Typical pole structure used at bends with stays*

## 2.4 SERVITUDE DETAILS

The servitude will be 22m wide, with 11m on both sides of the centre line. An access road exists along the existing road, thus no new road needs to be made there. The portion from the Dune 7 T-off to the site has access from the main road, therefore no new road needs to be created along that section.

## 2.5 CONSTRUCTION ACTIVITIES

All the components for the power line construction (steel pylons, conductors, and insulators, etc.) will be transported to site by road on low-bed trailers. Since the construction period is one month, short periods of traffic interruption may be experienced.

Erecting the structures, the pre-assembled wooden poles will be planted in the ground.

Concrete will be mixed and poured on site, thus all the concrete constituents (crushed stone, cement, water and sand) will also have to be transported to site. The conductors will be strung using heavy-duty mechanical winches.

It is expected that construction workers will be accommodated in Walvis Bay.

## 2.6 WASTE MATERIALS

Waste generation is an obvious impact of all projects, but it is how waste is managed that determines whether this part of the project's ecological footprint would be acceptable. Apart from the construction waste, normal domestic waste such as plastic bags, tins, bottles, paper, and packaging waste as well as hazardous waste (e.g. oil and fuel) will also be generated.

All waste could be dumped at the municipal waste dump site in Walvis Bay or a recycling company could be used.

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# 3 POLICY AND LEGAL FRAMEWORK

The legal and permitting requirements of the proposed 11kV power line are listed below.

*Table ii: Legal and permitting requirements*

| ACT | RELEVANT CONTENT | IMPLICATIONS FOR PROJECT |
|---|---|---|
| Environmental Management Act (7 of 2007)<br>EMA Regulations GN 28-30 (GG 4878) (February 2012) | Listed activities requiring an Environmental Clearance Certificate (GN No 29):<br>• The construction of facilities for the transmission and supply of electricity (1(b)) | • Conduct an EIA which covers all the components of the project which are listed in these regulations. |
| Electricity Act 4 of 2007 | • Requires that any generation and or distribution complies with laws relating to health, safety and environmental standards (s 18(4)(b)<br>• In the event that exemption from acquiring a license is granted, the Minister may impose conditions relating to public health safety or the protection of the environment | • Obliges NamPower to comply with all relevant provisions of the EMA and its regulations |
| Labour Act 11 of 2007 | The Health and Safety regulations GN 156/1997 (GG 1617) to this act prescribe conditions at the workplace, and inter alia deal with the following:<br>• Welfare and facilities at work-places, including lighting, floor space, ventilation, sanitary and washing facilities, usage and storage of volatile flammable substances, fire precautions, etc.;<br>• Appointment of a Safety Officer (s 6);<br>• Hazardous Substances including precautionary measures related to their transport, labelling, storage, | These regulations prescribe Health and safety issues at the workplace, including construction and electrical safety. |

| ACT | RELEVANT CONTENT | IMPLICATIONS FOR PROJECT |
|---|---|---|
| | and handling. Exposure limits, monitoring requirements, and record keeping are also detailed (s176-195);<br>• Physical hazards including noise, vibration, ionizing radiation, non-ionizing radiation, thermal requirements, illumination, windows and ventilation;<br>• Requirements for protective equipment (HSR s210-217); and<br>• First aid and emergency arrangements (HSR s228-242) | |
| The Atomic Energy and Radiation Protection Act, Act 5 of 2005: | Provides for the adequate protection of the environment and of people against the harmful effects of radiation by controlling and regulating the production, processing, handling, use, holding, storage, transport and disposal of radiation sources and radioactive materials, and controlling and regulating prescribed non-ionising radiation sources according to the standards set out by the ICNIRP. | Power line is remote from residences. Safety buffers to be maintained. |
| The Nature Conservation Ordinance (1975) as amended through the Nature Conservation Amendment Act of 1996. | Chapter 11: Game Parks, Nature Reserves, Conservancies and Wildlife Councils. | Permits are required for entering the Dorob National Park and for the removal of any indigenous plant or tree. It also stipulates that no damage may be done to any object of geological, ethnological, archaeological, historical or other scientific interest without the appropriate permits.<br>The applicable of the Dorob Park is however under the jurisdiction of the Walvis Bay Municipality, although legal process for the inclusion of the application portion into the townlands has not yet been finalised. |
| National Heritage Act No 27 of 2004 | • To provide for the protection and conservation of places and objects of heritage significance and the registration of such places and objects | • No heritage resources are expected since the land is significantly damaged. However, a chance-find procedure will be included in the EMP. |

| ACT | RELEVANT CONTENT | IMPLICATIONS FOR PROJECT |
|---|---|---|
| | • Establishes a body to govern matters relating to places and objects of heritage significance – National Heritage Council<br>• Establishes a National Heritage Register | |

These applicable obligations of these acts will be included in the EMP.

# 4 PUBLIC CONSULTATION

The consultant commenced with a stakeholder mapping exercise; the main stakeholders are listed in *Table iii* the table below. The land falls partly within the Dorob National Park and the Walvis Bay Municipal Boundary (

). This boundary is being extended as per the newly approved Walvis Bay Structure Plan (*Figure ix*). Farm 58 (includes the Cleanergy site) and surrounds is practically under the management of the Walvis Bay Municipality. The route traverses townlands to the south, which falls within the jurisdiction of the Walvis Bay Municipality. (Appendix B).

*Table iii: Main stakeholders of the Cleanergy Grid Connection Project EIA Process*

| Entity | Role |
|---|---|
| Municipality of Walvis Bay | Land Owner, Jurisdiction |
| Ministry of Environment, Forestry and Tourism (MEFT) | Area partly within the Dorob National Park, Jurisdiction |
| Civil Aviation Authority | Civil Aviation issues relating to the nearby Rooikop Airport, although the power line will not penetrate the approach zones of the airport. |
| NamWater | Proposed route partly adjacent to a NamWater pipeline |
| Roads Authority (RA) | Route crosses Main Road 36 |
| ErongoRED | Electricity Distributor |

The details of the public consultation process is provided in Appendix B.

A neighbouring developer to the Cleanergy project was the only entity who commented on the proposed power line, besides others making business contact. Two issues were raised, namely:

1) Whether their access will be restricted because of the power line. The power line will be construction according to established SABS standards, ruling out possible height and access issues to neighbouring sites

2) That there are other infrastructure servitudes planned along the proposed corridor. However, the engineering team confirmed that there are no confirmed servitudes planned along the corridor.

   The correspondence with this entity is provided in Appendix B4. There were no further objections or comments received.

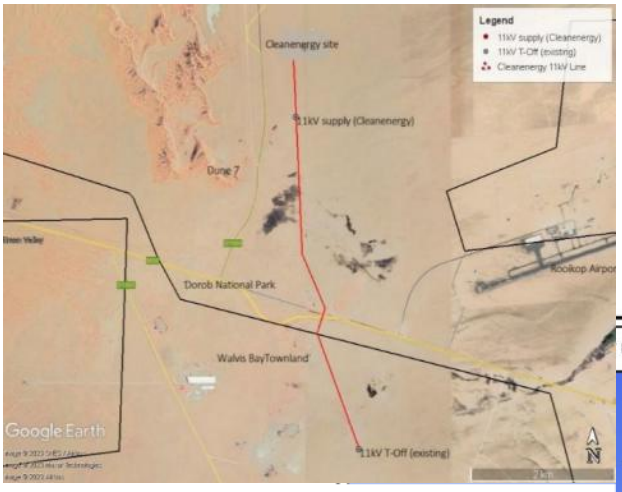


*Figure ix: Locality of the existing Municipal/Dorob National Park boundary*

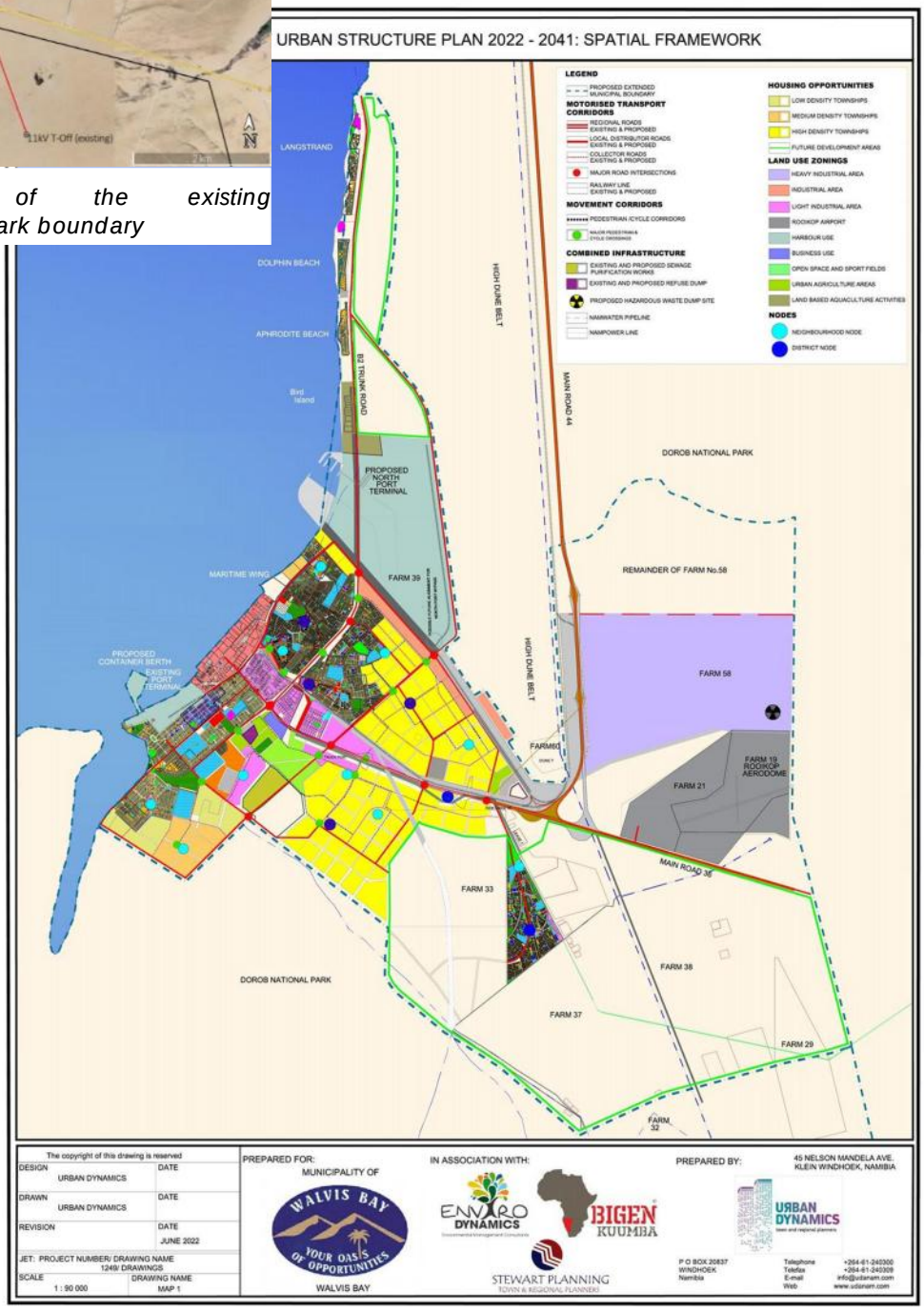


*Figure x Locality of the new Municipal/ Dorob Park National Boundary (Source: Urban Dynamics at al. 2022)*

# 5 BIOPHYSICAL AND SOCIAL OVERVIEW

This section contains those biophysical and social baseline sensitivities and characteristics of the project environment, which are likely to be affected by the project. Characteristics are also mentioned, which are likely to influence the project's design and sustainability.

## 5.1 CLIMATE

| CRITERIA | DESCRIPTION (Mendelsohn et al, 2002) |
|---|---|
| Rainfall | Central Namib. Described as an arid environment. Average ≤50mm per annum |
| Temperature | Average min 15˚C, max 20˚C |
| Fog | Prevalent, average 100 days per year, containing suspended salts, causing corrosion |
| Wind | Prevalent south-westerly and north-westerly winds, causing sediment movement and wind-blown sand in a northerly and easterly direction. Windblown detritus also entrapped in dunes. |

## 5.2 HABITAT

Table iv is a summary of the gravel plain habitat which is generally descriptive of the study area. The proposed corridor for the power line has been largely disturbed due to the construction and operation of the existing ErongoRED line, the above ground bulk water pipeline, the main road (roadworks currently underway) , a quarry, and a dimension stone processing facility (Figure xiii) .

*Table iv:Summary of the project area habitat characteristics (Source: Irish 2012, in Urban Dynamics, 2022).*

| | |
|---|---|
| Description | Hard ground adjacent to dunes. Includes both relatively flat gravel plains and low rolling marble hills. |
| Vegetation | Largely vegetationless due to wind scouring in the area. Further east, scattered *Arthraerua luebnitziae* and *Zygophyllum simplex*. Other species associated with marble hills and watercourses (not along study corridor). |
| Occurrence | Inland of the barchanoid dune habitat. |
| Occurrence elsewhere | Much of the Central Namib Desert is composed of broadly similar habitat, although strictly climatically comparable habitat will only be found in a narrow strip at similar distance from the coast. |
| Habitat determinants | Substrate determines the habitat. |

| Vulnerabilities and threats | Substrate disruption |
|---|---|
| Total no of taxa per habitat | 117 |
| Total no of endemic taxa | 35 |
| Total no of taxa with threatened status | 10 |
| Total no of taxa with legal status | 2 |

The majority of taxa occurring in the area are invertebrates; with smaller numbers of mammals, reptiles and plant species. Birds are discussed in the following section.

*Figure xii: Inland hummock vegetation present along small parts of the route.*

*Figure xii: Significant disturbance present, due to habitat disruption during previous construction activities.*

*Figure xiii:Presence of roads, water pipeline and power lines, with current work on the road intersections.*

## 5.3 BIRD DIVERSITY

It is a well known fact that specific bird species are prone to collisions with power lines. A thorough outline in this regard is provided in the specialist report (Ecoserve, 2023) prepared for this Scoping study. Some of the important summaries from this study are provided below.

The avifauna habitats in the greater study area have a high conservation status. They include two officially Protected Areas and two Ramsar sites and five Important Bird Areas (sites of international significance for the conservation of birds at the Global, Regional or Sub-regional level). IBAs are characterised by high concentrations of bird species and, in the present case of aquatic species, a high degree of movements among sites. Although the local study site area is likely to be of relatively lower sensitivity in terms of resident avifauna, its proximity to the above sensitive aquatic habitats in the greater area and the mobility of the aquatic bird species moving through the area are an important consideration.

The specialist report provides a detailed description of these sites, as well as the birds expected to occur in the Walvis Bay area.

Risk assessment and mitigation efforts are directed towards priority species, defined as those that have a high biological significance, i.e. primarily Red Data species (including those with migrant status) and/or endemic or near-endemic species. The eight high priority species (8 Namibian Red Data [3 also Globally Endangered] / 5 migrant / all aquatic, all power line-prone) are as follows:

- Cape Cormorant (Endangered, also Globally Endangered; resident with extensive movements)
- Lesser Flamingo (Vulnerable, also Globally Near Threatened; Intra-African migrant)
- Greater Flamingo (Vulnerable; Intra-African migrant)
- Great White Pelican (Vulnerable; sedentary, nomadic)
- Hartlaub's Gull (Vulnerable; sedentary, with local movements)
- Caspian Tern (Vulnerable; resident/nomadic; intra-African migrant)
- Maccoa Duck (Near Threatened, Globally Vulnerable; resident, nomadic)
- Black-necked Grebe (Near Threatened; nomadic; intra-African migrant)

Monitoring data on power lines has been ongoing for about two decades, under the NamPower-NNF partnership arrangement. Even though this data is still deficient, it does provide some indication of areas that are sensitive in terms of collisions.

A significant impact on flamingos and other waterbirds, including pelicans, has been recorded on the westernmost portion of the 132 kV power line to the west of the study site, which has been monitored by the NamPower/NNF Partnership from 2009-2020. The clear north-south flyway is close at a wetland at the sewage works, where the collisions are concentrated (Figure xiv).

By contrast, there is only one flamingo mortality and one pelican mortality for the 11-year monitoring period on the north-south axis of the line, to the north-east of the present study area. There are also no large water bodies along this section, and levels of disturbance are relatively high in places.

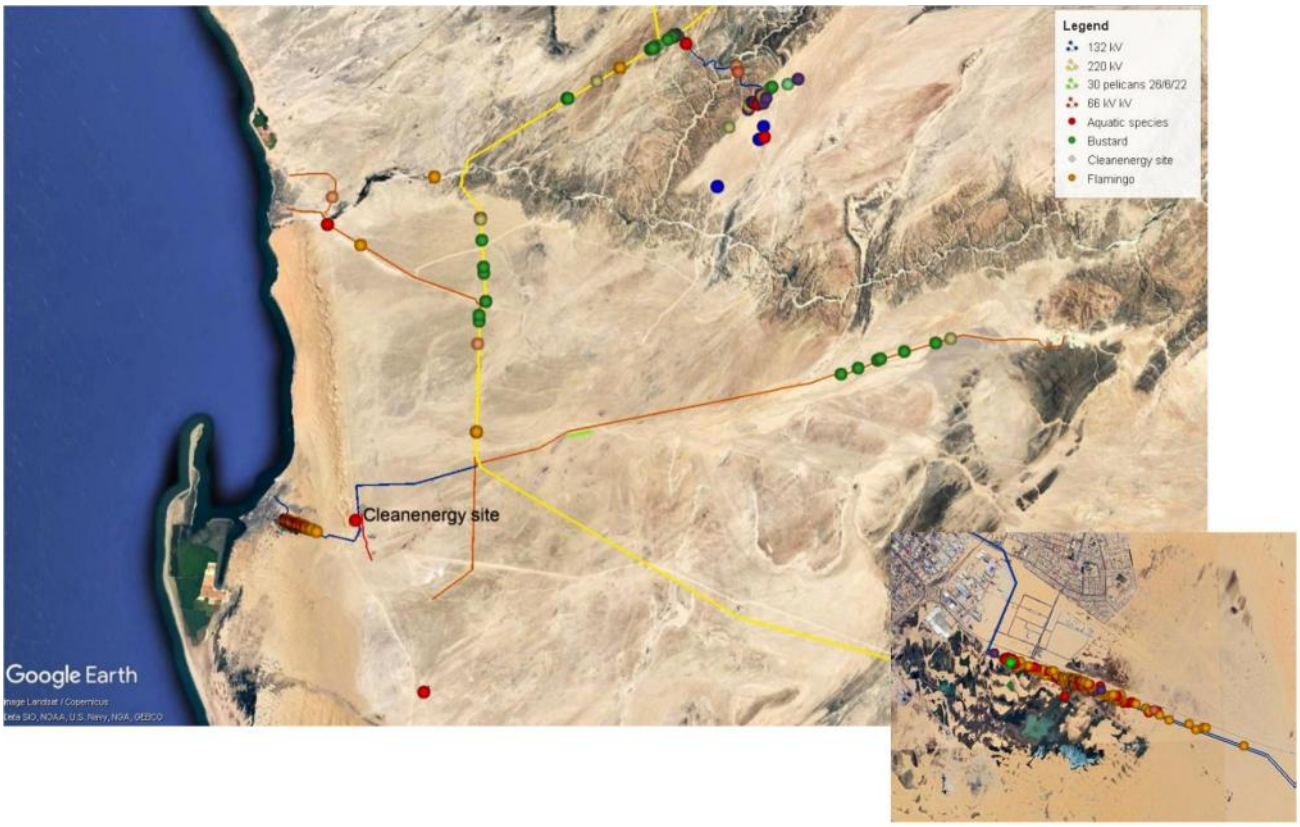


*Figure xiv: Bird collisions recorded over an 11-year period under the NNF-NamPower partnership in the study area (Source: Ecoserve, 2023).*

In conclusion, the proposed route lies in an overall area of high bird sensitivity, being near the coastline and water bodies, with flight paths leading inland and along the coast. However, this particular route is expected to have a low sensitivity for potential power line-bird interactions. There are no water bodies or other bird attractions near the route. There also does not appear to be a significant flight path intersecting with the route.

## 5.4 SOCIAL ENVIRONMENT

### *5.4.1 Land use*

Farm 58 is a planned industrial area for the purposes of heavy industrial activities (Figure x). The formal subdivision process has not been finalised and services have not been construction to the erven. The site is therefore currently vacant, but with a number of negotiations currently underway for the establishment of industrial activities.

Other land uses along the route include quarrying, and dimension stone cutting. Otherwise the area is vacant as part of the farmlands of the Municipality of Walvis Bay.

Dune 7 is an important visitor destination and is frequently visited as such. The visual resources in the vicinity is therefore important. The visual resources are towards the dune belt as well as the view towards the ocean, which will not be affected in any way by this proposed power line.

Walvis Bay currently has an estimated population of 122040 people (Urban Dynamics et. al, 2023). Figure x indicates the future planning of Walvis Bay, to accommodate estimated growth. The proposed route has been aligned along existing corridors.

Walvis Bay, the Erongo Region, and Namibia, currently experiences a post-Covid economic slump. Updated unemployment figures are not available, however, a high unemployment rate of 35% or higher for Walvis Bay is expected.

Archaeological remains in the Walvis Bay surrounds are concentrated at the Kuiseb River Delta. The route corridor, previously disturbed for the construction and operation of infrastructure, is not expected to have significant archaeological finds.

# 6 IMPACT ASSESSMENT

The purpose of this assessment is to identify and assess all potential impacts of the line on the biophysical and social environment.

## 6.1 METHODOLOGY FOR ASSESSING KEY IMPACTS

The impact assessment methodology is contained in Table v below and the assessment follows in Table vi.

*Table v: Impact assessment methodology used*

| | DESCRIPTION |
|---|---|
| NATURE | Reviews the type of effect that the proposed activity will have on the relevant component of the environment and includes ''what will be affected and how?''. |
| EXTENT | Geographic area. Indicates whether the impact will be within a limited area (on site where construction is to take place); local (limited to within 15 km of the area); regional (limited to ~100 km radius); national (limited to the coastline of Namibia); or international (extending beyond Namibia's boarders). |
| DURATION | Whether the impact will be temporary (during construction only), short term (1-5 years), medium term (5-10 years), long term (longer than 10 years, but will cease after operation) or permanent. |
| INTENSITY | Establishes whether the magnitude of the impact is destructive or innocuous and whether or not it exceeds set standards, and is described as none (no impact); low (where natural/ social environmental functions and processes are negligibly affected); medium (where the environment continues to function but in a noticeably modified manner); or high (where environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements). |
| PROBABILITY | Considers the likelihood of the impact occurring and is described as uncertain, improbable (low likelihood), probable (distinct possibility), highly probable (most likely) or definite (impact will occur regardless of prevention measures). |
| SIGNIFICANCE | Significance is given before and after mitigation. Low if the impact will not have an influence on the decision or require to be significantly accommodated in the project design. Medium if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the route can be used, but with deviations or mitigation). High where it could have a ''no-go'' implication regardless of any possible mitigation (an alternative route should be used). |
| STATUS OF THE IMPACT | A statement of whether the impact is positive (a benefit), negative (a cost), or neutral. Indicate in each case who is likely to benefit and who is likely to bear the costs of each impact. |
| DEGREE OF CONFIDENCE IN PREDICTIONS | Based on the availability of specialist knowledge and other information. |

*Table vi: Impact assessment*

| POTENTIAL IMPACT | EXTENT | DURATION | INTENSITY | PROBABILITY | STATUS | DEGREE OF CONF. | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT | POST-MITIGATION |
| Soil pollution particularly during construction. | On site | Long term | Low | Probable | Negative | High | Low | • Spill and waste management, cement mixing on impermeable layer, other provisions in EMP. | None |
| Windblown sand during construction, with increased vehicular movement, construction activities etc. | On site | Short term | Low to medium | High | Negative.<br>The wind direction is downwind and generally remote from any residences and activities.<br>Mostly in an existing sandy environment. | High | Low | • Adaptive management on site. | Low |
| Loss of biodiversity through removal of plants (very limited to *salsola and other hummock vegetation only* in isolated cases) and life on the plains during construction. | Local | Short term | Low | High | Negative | High | Low | • Avoid destruction of any *salsola* and other hummocks (They stabilise the soil and provide habitat to desert life)<br>• Limit movement to disturbed areas only. | Low |

| POTENTIAL IMPACT | EXTENT | DURATION | INTENSITY | PROBABILITY | STATUS | DEGREE OF CONF. | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT | POST-MITIGATION |
| Employment Creation during construction and operation. | Local | Short term (one month) and indirect long term. | Low | High | Positive for local communities. | High | Low | • Local people employed where possible. | Low |
| Health and safety compromised during construction and operation, associated with exposure to electrical currents, heights, general construction safety aspects. | Local | Long term to permanent | Medium | Probable | Negative | High | Medium | • Implement standard health and safety procedures for construction and operation of power lines and in line with Namibian health and safety legislation.<br>• Good communication about the health and safety risks<br>• Constant monitoring.<br>• Training of staff.<br>• Emergency plan for failures.<br>• Other measures in the EMP. | Low |
| Visual impact during construction and operation | On site | Long term | Low | Definite | Negative for road users, visitors to Dune 7 | High | Low | • Constant waste management.<br>• General neatness of the site according to the EMP. | Low |

| POTENTIAL IMPACT | EXTENT | DURATION | INTENSITY | PROBABILITY | STATUS | DEGREE OF CONF. | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT | POST-MITIGATION |
| | | | | | | | | • Wood structures are supported<br>• Rehabilitation according to the EMP. | |
| Access restrictions, conflict with other infrastructure corridors. | On site | Long term | Medium | Improbable | Negative with other stakeholders. | High | Low | • No other servitudes planned that the Engineer is aware of. To be confirmed further.<br>• Ensure height is sufficient not to restrict access at properties. | None |
| Sustainability of project due to high maintenance (wind and corrosion effects). | On site | Long term | High | Definite | Negative for Developer | High | Medium | • Include these matters in the O&M contract.<br>• Consider wind and corrosion matters in final design. | Medium to low |
| Bird electrocutions on power line infrastructure during operation may cause injury or mortality to (larger) birds; disruptions to the power supply.<br>Indirect impacts:<br>Bird species potentially affected: one high priority aquatic species | On site | Long term | Low | Improbable | Negative | High | Low | • Insulation of live sections: provision of an air space safety gap 300 mm below the lowest phase (conductor) on wooden poles and the earth wire; offsetting of 'jumpers' on strain poles; appropriate insulation of | None |

| POTENTIAL IMPACT | EXTENT | DURATION | INTENSITY | PROBABILITY | STATUS | DEGREE OF CONF. | SIGNIFICANCE | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | PRE-MITIGATION | MITIGATION/ ENHANCEMENT | POST-MITIGATION |
| Great White Pelican | | | | | | | | transformer structures and stay wires .<br>• Monitoring is essential as described in the EMP. | |
| Bird Collisions on power line infrastructure | On Site | Long term | High | Probable | Negative | Moderate | Low | • Monitoring as described in the EMP<br>• Should there be repeated incidents, then markers are recommended, as per the EMP. | None |

# 7 ALTERNATIVES

The no-go implication of this project would be a lack of grid power for the proposed Cleanergy hydrogen project in Walvis Bay. ErongoRED and NamPower are not currently in a position to provide the power required.

From an environmental and social perspective, there are negligible differences between the alternative structures to be used. Notably the potential bird interactions on both structures are similar. The engineering team will consider how these alternative structures perform in the coastal climate, particularly as far as potential corrosion is concerned.

The route alternative selected runs along existing and planned corridors and is to replace an existing ErongoRED line for a large part of the route. Alternative routes would be longer in distance, cause severance of land, destroy more habitat, create more visual impact and were therefore no considered.

# 8 CONCLUSIONS AND RECOMMENDATIONS

It is believed that this project is necessary and desirable for the economic benefit of developing the green hydrogen industry in Namibia. The consultant is satisfied that all possible alternatives have been selected to avoid environmental and social impacts and recommends that the final pylon structures selected take into account potential erosion.

The potential impacts identified and assessed for this proposed 5.3km 11kV power line south of Farm 58, Walvis Bay, are listed in Table vii below. Corrosion and wind-blown sand is known to create maintenance challenges for infrastructure along the Namibian Coast. This matter can be addressed by the engineering team to some extent, but remains a reality in the project area. The other impacts listed are all rated low or of no significance if mitigation is applied.

Monitoring is required to detect possible bird electrocutions and collisions, as prescribed in the EMP. All other mitigation measures are also detailed (Appendix D).

It is recommended that an ECC be issued for this project, subject to the implementation of the EMP.

*Table vii: Impacts assessed and ratings after mitigation*

| POTENTIAL IMPACT | IMPACT RATING AFTER MITIGATION |
|---|---|
| Soil pollution particularly during construction. | None |
| Windblown sand during construction, with increased vehicular movement, construction activities etc. | Low |
| Loss of biodiversity through removal of plants (very limited to *salsola and other hummock vegetation only* in isolated cases) and life on the plains during construction. | Low |
| Employment creation during construction and operation. | Low |
| Health and safety compromised during construction and operation, associated with exposure to electrical currents, heights, general construction safety aspects. | Low |
| Visual impact during construction and operation | Low |
| Access restrictions, conflict with other infrastructure corridors. | Low |
| Sustainability of project due to high maintenance (wind and corrosion effects). | Medium to Low |
| Bird electrocutions on power line infrastructure | None |
| Bird collisions on power line infrastructure | Low to None |

# 9 REFERENCES

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