

ENVIRONMENTAL SCOPING ASSESSMENT

BANNERMAN RESOURCES 132 kV OVERHEAD TRANSMISSION LINE AND SUBSTATION WITH METERING STATION (ERONGO REGION)

**FINAL SCOPING REPORT FOR REVIEW BY THE
OFFICE OF THE ENVIRONMENTAL COMMISSIONER**

DECEMBER 2021



PROJECT INFORMATION

Proponent: **BANNERMAN MINING RESOURCES (NAMIBIA) (PTY) LTD**

Project Title: **BANNERMAN RESOURCES 132 kV OVERHEAD AND SUBSTATION WITH METERING STATION (ERONGO REGION)**

Type of Project: **ENVIRONMENTAL SCOPING ASSESSMENT**

Project Location: **SWAKOPMUND – ERONGO REGION (NAMIBIA)**

Project Number: **2021/ERONG/BAN-01**

Competent Authority: **MINISTRY OF MINES AND ENERGY
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WINDHOEK**

Approving Authority: **MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
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LIST OF ACRONYMS

BID	Background Information Document
BFD	Bird Flight Diverter
°C	degrees Celsius
CBD	Convention on Biological Diversity
CMS	Convention on Migratory Species
DEA	Directorate of Environmental Affairs
DFS	Definitive Feasibility Study
DSR	Draft Scoping Report
EAP	Environmental Assessment Practitioner
ECC	Environmental Clearance Certificate
ECO	Environmental Control Officer
i.e.	Example
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EIS	Environmental Information Service
EMA	Environmental Management Act
EMI	Electro-magnetic interference
EMP	Environmental Management Plan
EPL	Exclusive Prospecting Licence
ESA	Environmental Scoping Assessment

ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
etc.	Etcetera
FSR	Final Scoping Report
Ha	Hectare
I&AP	Interested and Affected Parties
IBA	Important Bird Area
IPP	Independent Power Producer
IUCN	International Union for Conservation of Nature
kV	KiloVolt
kVA	Kilowatts Ampère
L	Litre
MAWLR	Ministry of Agriculture, Water and Land Reform
MET	Ministry of Environment and Tourism (formerly)
MEFT	Ministry of Environment, Forestry and Tourism
ML	Mining Licence
MME	Ministry of Mines and Energy
ML	Mining Licence
MVA	Mega-volt-amperes
MW	MegaWatt
NAMCARs	Namibia Civil Aviation Regulations
NAMCATs-AH	Namibia Civil Aviation Technical Standards - Aerodromes and Helipads
NamPower	Namibia Power Corporation (Pty) Ltd
NDP5	Namibia's 5 th National Development Plan
NIRP	National Integrated Resource Plan
NMD	Nominal Maximum Demand
No	Number
OHTL	Overhead Transmission Line
OPGW	Optical Ground Wire (earth wire)
O&M	Operations and Maintenance
PPP	Public Participation Process
QDS	Quarter Degree Square
SABAP	Southern African Bird Atlas Project (SABAP1 & SABAP2)
S/S	Substation
ToR	Terms of Reference

UNFCCC United Nations Framework Convention on Climate Change

GLOSSARY OF TERMS

Alternatives - A possible course of action, in place of another, that would meet the same purpose and need but which would avoid or minimize negative impacts or enhance project benefits. These can include alternative locations/sites, routes, layouts, processes, designs, schedules and/or inputs. The “no-go” alternative constitutes the ‘without project’ option and provides a benchmark against which to evaluate changes; development should result in net benefit to society and should avoid undesirable negative impacts.

Assessment - The process of collecting, organising, analysing, interpreting and communicating information relevant to decision making.

Bulk Supply - The wholesale supply of i.e. water on a business-orientated basis, in large quantities, whether in treated or untreated form, for any utilisation purpose to a customer for own use or for subsequent supply by the customer to consumers.

Competent Authority - Means a body or person empowered under the local authorities act or Environmental Management Act to enforce the rule of law.

Critically Endangered (IUCN) - A taxon is Critically Endangered when the best available evidence indicates that it meets any of the criteria A to E for Critically Endangered (see Section V of the IUCN Red List Categories and Criteria¹), and it is therefore considered to be facing an extremely high risk of extinction in the wild.

Cumulative Impacts - In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Decreaser grass - a dominant grass in good, well-managed veld that will decrease under any form of mismanagement, such as severe disturbance, untimely burn, overgrazing or under-utilisation.

Endangered (IUCN) - A taxon is Endangered when the best available evidence indicates that it meets any of the criteria A to E for Endangered (see Section V of the IUCN Red List Categories and Criteria²), and it is therefore considered to be facing a very high risk of extinction in the wild.

Endemic – A species occurring within a restricted range.

¹ Available at http://s3.amazonaws.com/iucnredlist-newcms/staging/public/attachments/3097/redlist_cats_crit_en.pdf

² Available at http://s3.amazonaws.com/iucnredlist-newcms/staging/public/attachments/3097/redlist_cats_crit_en.pdf

Endemic status categories:

E = endemic; NE = near endemic; SA = Southern Africa; Nam = Namibia

Environment - As defined in the Environmental Assessment Policy and Environmental Management Act - “land, water and air; all organic and inorganic matter and living organisms as well as biological diversity; the interacting natural systems that include components referred to in sub-paragraphs, the human environment insofar as it represents archaeological, aesthetic, cultural, historic, economic, paleontological or social values”.

Environmental Impact Assessment (EIA) - The process of examining the environmental effects of a development as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012) for activities listed as List of Activities which may not be undertaken without an Environmental Clearance Certificate from the Environmental Commissioner (GN. No. 29 of 2012).

Environmental Management Plan (EMP) - A working document on environmental and socioeconomic mitigation measures, which must be implemented by several responsible parties during all the phases of the proposed project.

Evaluation – the process of ascertaining the relative importance/significance of information, in light of people’s values, preference and judgements in order to make a decision.

Hazard - Anything that has the potential to cause damage to life, property and/or the environment. The hazard of a particular material or installation is constant; that is, it would present the same hazard wherever it was present.

Increaser grass - a grass species that will increase under any type of mismanagement or disturbance.

Interested and Affected Party (I&AP) - any person, group of persons or organisation interested in, or affected by an activity; and any organ of state that may have jurisdiction over any aspect of the activity.

Mitigate - The implementation of practical measures to reduce adverse impacts.

Protected - Protected under Namibian legislation.

Proponent - Any person who has submitted or intends to submit an application for an authorisation, as legislated by the Environmental Management Act no. 7 of 2007, to undertake an activity or activities identified as a listed activity or listed activities; or in any other notice published by the Minister or Ministry of Environment, Forestry & Tourism.

Public - Citizens who have diverse cultural, educational, political and socio-economic characteristics. The public is not a homogeneous and unified group of people with a set of agreed common interests and aims. There is no single public. There are a number of publics, some of whom may emerge at any time during the process depending on their particular concerns and the issues involved.

Public consultation - The process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities. The level of stakeholder engagement varies depending on the nature of the proposal or activity as well as the level of commitment by stakeholders to the process. Stakeholder engagement can therefore be described by a spectrum or continuum of increasing levels of engagement in the decision-making process. The term is considered to be more appropriate than the term “public participation”.

The term therefore includes the proponent, authorities (both the lead authority and other authorities) and all interested and affected parties (I&APs). The principle that environmental consultants and stakeholder engagement practitioners should be independent and unbiased excludes these groups from being considered stakeholders.

IUCN Red List - The IUCN Red List of Threatened Species™ is widely recognised as a comprehensive, objective global approach for evaluating the conservation status of plant and animal species. IUCN Red List Categories: LC = least concern (secure);

NT = near threatened;

VU = vulnerable;

EN = endangered;

CE = critically endangered;

EW = extinct in the wild

EX = extinct; G = global status

Optical Ground Wire – A type of cable used in overhead power lines, combining the functions of grounding and communications.

Pentad – A 5-minute x 5-minute coordinate grid super-imposed over the continent for spatial reference. Nine pentads make up one Quarter Degree Square.

Power Line Interaction Categories:

C = collision

D = disturbance/habitat disturbance

E = electrocution

N = having the potential to disrupt the power
supply through nesting/other activities

Scoping Process - Process of identifying: issues that will be relevant for consideration of the application; the potential environmental impacts of the proposed activity; and alternatives to the proposed activity that are feasible and reasonable.

Significant Effect/Impact - Means an impact that by its magnitude, duration, or probability of occurrence may have a notable effect on one or more aspects of the environment.

Sustainable Development – Development that meets the needs of the current generation without compromising the ability of future generations to meet their own needs and aspirations.

Species of Special Concern - Those species listed in the Endangered, Threatened, Rare, Indeterminate, or Monitoring categories of the South African Red Data Books, and/or species listed in Globally Near Threatened, Nationally Threatened or Nationally Near Threatened categories (Barnes, 1998).

Topsoil - The top 150 mm of soil (topsoil) and root material of cleared vegetation.

Vulnerable - A taxon is vulnerable when the best available evidence indicates that it meets any of the criteria A to E for Vulnerable (see Section V of the IUCN Red List Categories and Criteria³), and it is therefore considered to be facing a high risk of extinction in the wild.

³ Available at http://s3.amazonaws.com/iucnredlist-newcms/staging/public/attachments/3097/redlist_cats_crit_en.pdf

EXECUTIVE SUMMARY

Bannerman Mining Resources (Namibia) Pty. Ltd (the Proponent) is an Australian-based uranium company, invested in the Etangio-8 Uranium Project in Namibia. It is believed to be one of the world's largest undeveloped uranium projects. The Project received an Environmental Clearance Certificate from the Namibian authority through the Ministry of Mines and Energy in 2012 after an extensive EIA was conducted. The Board of Directors has now approved the commencement of the Definitive Feasibility Study (DFS) on the Project with completion targeted for the September 2022 quarter.

The proposed Project covered in this Environmental Scoping Report entails the construction of a 132 kV Overhead Transmission Line (OHTL) and Substation with Metering Station to supply electricity to the planned Etanago-8 Uranium Project near Swakopmund.

The electricity supply will come from the Namibian Power Corporation (Pty) Ltd (NamPower) transmission network at the Kuiseb Substation 15 km east of Walvis Bay. The Kuiseb Substation has an existing spare 132 kV Feeder Bay that will be utilised for the supply to the proposed 132 kV OHTL. From here the 132 kV OHTL will run for 16,7 km in a northern direction parallel to and east of the existing two 220 kV OHTL to Walmund Substation, across the C28 Main Road for 3,4 km and then turn east for 4,9 km towards the NamPower metering station where it terminates at the Etanago-8 Uranium Project's Substation. A small line section is still required between the Metering Station and the mine's Substation, which will be located as close to the highest load as possible to reduce electrical losses.

In accordance with the Environmental Management Act, (Act No. 7 of 2007) and within the framework of the Environmental Impact Assessment Regulations (2012), Urban Green cc (EAP) has been appointed by the Proponent to undertake an Environmental Scoping Assessment (ESA) and apply for an Environmental Clearance Certificate for the proposed Project. This ESA process was carried out in accordance with provisions for EA, as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), provided for by Section 56 of the Environmental Management Act (No. 7 of 2007).

Given the nature of the activities associated with the proposed Project and the sensitivity of the receiving environment, an Ecological Baseline Assessment (see Section 5.2), an Archaeological Baseline Assessment (see Appendix E) and an Avifauna Impact Assessment (see Appendix F) was conducted.

The proposed Project Site falls within *Central Namib* coast area in the central western parts of Namibia approximately 25 km inland from the Atlantic Ocean.

Project benefits are mainly of a socio-economic nature (Section 4.10) comprising:

- Employment creation
- Community Development
- Economic Spin-offs & Opportunities
- Security in Supply of Electricity to Etanago-8 Uranium Mine as an employer

The physical environment of the Project area (as discussed in Section 5.1) poses a few challenges to the construction and maintenance of the OHTL, Substation and Metering station. Fog, extreme daily temperature fluctuations and wind will have an influence in the maintenance of the steel monopole structures and electrical equipment (see Section 7.4.2).

Sensitive topographical (section 5.1.3 and 5.1.4) features of the receiving environment are:

Gravel plains consisting of biological soil crust covered with lichens;

Drainage lines with endemic flora species;

Rocky outcrops with shelter for desert fauna species.

The *Central Namib* forms part of southern Africa's *Desert Biome*. The lack of rain has led to adaptations by plants and animals, which facilitate use of fog as an alternative water source. Due to the low rainfall, there is also limited amount of vegetation and as a consequence many animals use detritus, which is composed of wind-blown dried bits of vegetation as a food source. Thus the extensive use of fog and detritus largely characterises the biology of the Namib and therefore the high endemism in these specifically adapted desert species. The level of endemism is exceptionally high among flora, insect - and reptile species (see section 5.2)

The most significant activities in the larger surrounding area of the proposed Project are conservation, nature-based tourism, mining, commerce and industrial development in the municipal areas and limited subsistence agriculture.

The current land use of the area over which the proposed 132 kV OHTL passes is state owned conservation area, i.e. Namib Naukluft National Park to the west and Dorob National Park to the east (see Figure 5.1.8) A number of Important Bird Areas (IBA) are located nearby and includes Walvis Bay lagoon that was designated as a Ramsar site, Cape Cross Lagoon in the north; Mile 4 Saltworks, the 30 km-beach from Walvis-Swakopmund, Sandwich Harbour in the south and the Namib-Naukluft Park.

Mines in the surrounding area include Rössing Uranium, Langer Heinrich and Husab Mine. Two EPLs (6820 and 3669) fall within the servitude as well as a Reconnaissance License. The route alignment was adjusted to Route Option 3 to miss EPL 7747.

Nature-based tourism areas of importance in the vicinity of the Project area are the Goanikontes Viewpoint (approximately 2 km to the north), Swakop River (approximately 4 km to the north) and the Welwitschia plains (approximately 16 km to the east).

The closest populated area to the proposed Project site is that of Swakopmund, located about 25km to the north-west of Walmund Substation, while Walvis Bay is located about 36km to the south-west of Kuiseb Substation. The Topnaar people still live along the Kuiseb River inside the Namib Naukluft Park and make a living of subsistent farming. Limited agricultural cultivation takes place along the Swakop.

A corridor of infrastructure exists in a north-south direction between Swakopmund and Walvis Bay. Infrastructure found within the area includes overhead power lines; water pipelines and pump stations, tarred and gravel roads and dirt tracks. The proposed 132 kV OHTL falls within the corridor of existing infrastructure. Land use and infrastructure is discussed in Section 5.3.

The visual aesthetics and as a result the sense of place of the Project area is vast desert landscape. The Namib Naukluft Park constitutes a wide expanse of desert that has been informally managed as a wilderness area for many years. Thousands of tourists and locals are attracted to this area each year to experience the sense of place that this vast landscape evokes. Uranium mining and development in the vicinity might potentially threatened the sense of place. (See section 5.4)

The Namib Naukluft Park's sense of place in the Project area have, however, been altered by the infrastructure corridor that exists between Walvis Bay and Swakopmund. The railroad and highway on the west and various major OHTLs to the east thereof, give the impression of industrial development. The sense of place in this part of the NNP is not pristine desert anymore and it is recommended that infrastructure development be clustered together to avoid further encroachment to the east into the pristine desert environment. The proposed 132 kV OHTL lies within this infrastructure corridor.

Public consultation for the purposes of this project was done as prescribed by Regulations 21 to 24 of the Environmental Impact Assessment Regulations (GN. 30 of 2012). Engagement with the public and authorities as part of the first round of public consultation commenced on the 8th of October 2021 and concluded on the 29th of October 2021. The 2nd round of public consultation took place between 2 to 9 December 2021. During both rounds of consultation, I&APs and authorities were given an opportunity to register and/or submit comments and/or concerns on the proposed project (see Chapter 6).

Concerns raised during the 1st round of public consultation included the following:

- The road next to Walmund sub-station is labelled incorrectly in the BID as the C26, it is in fact the C28.

- Archaeological assessment - as the area where the power line will be located could potentially have known sites or expected chance finds due to the abundant heritage in the area from the war times.
- Habitat disturbance - the known animal routes to water sources could also potentially be disturbed and will need to be assessed.
- Visual impact and sense of place - the influence on tourism should also be reviewed and potential offsets if required.
- Waste management - hydrocarbon & effluent management.
- Civil aviation - safety with regards to obstruction or interference of flightpaths. Specifically, requirement for aircraft warning spheres on spans at road crossings (span ahead, crossing span [over road], span after).
- Avifauna - (fatalities, injuries; species being the marine varieties including pink flamingo, seagulls, terns, etc.), as such bird diverters, anti-perching, and stringing visibility enhancement measures.
- All stayed/guyed structures require high visibility stay protectors, especially along known travel routes for vehicles.
- Metal corrosion and pollution management for line materials, components and structures (not meant in the sense of causing pollution, but rather polluting elements depositing on the power line due to environmental interaction/influence; such as dust deposits, corrosive deposits, wetting and moisture deposits, etc.). This usually necessitates frequent intervention to maintain the power line.

During the screening stage, the following issues for further investigation were identified:

- Habitat destruction and alteration and disturbance of animal routes to water sources;
- Avian and bat collisions/electrocutions;
- Destruction of possible Archaeological sites;
- Electric and Magnetic fields of three Overhead Transmission Lines in one corridor;
- Hazardous materials and waste management;
- Occupational Health and Safety;
- Civil Aviation obstruction of flightpaths;
- Road Crossing permit required;
- Visual and sense of place;
- Land Use – Namib Naukluft Park, Dorob National Park and existing EPL's.

No comments were submitted during the 2nd round of public consultation.

The following impacts were identified as to not have any negative impact (i.e. positive impacts) or minor impacts not of any significance that require further assessment:

- The socio-economic benefits mentioned above and in Section 4.10. & Section 7.1.1.1
- Loss of Archaeological sites on the basis of the field survey data that concluded that construction is not considered to pose a significant threat to the archaeology of the area concerned. (See Section 7.1.1.2)
- The OHTL was found not an obstruction to the Walvis Bay Airport (see Section 7.1.1.3)
- Electric and Magnetic Fields (EMF) was not found to have an adverse impact on human or environment. (see Section 7.1.1.4)

Construction impacts identified are loss of biodiversity and habitat destruction of flora and fauna species, visual impact, land use and value, waste management, ground and surface water pollution, natural resources usage and socio-economic impacts that are discussed in Section 7.4.1.7. (See Section 7.4.1)

Given the size of the project footprint within the larger Namib Naukluft Park and the sensitivity of the flora as discussed in this report, it can be concluded that the potential impact significance to the flora is expected to be **moderate** before mitigation. By implementing the suggested mitigations, the significance can be reduced to **low** as discussed in section 7.4.1.1.

Taking into consideration the small footprint of the area to be disturbed by the proposed OHTL and the locality of the Project on the western edge of the Namib Naukluft Park, it can be concluded that the potential impact significance to the fauna is expected to be **low** before mitigation and **very low** after mitigation as discussed in section 7.4.1.2.

The significance of the impact of land use of the area has the potential to be **moderate** but can be **low** if transparent agreements are undertaken between interested and affected parties during project life. (See section 7.4.1.3)

Waste management and pollution as well as natural resource usage are discussed in section 7.4.1.4, 7.4.1.5 and 7.4.1.6 respectively. These impacts can be mitigated to be **very low** to **no significance** if managed according to the EMP provided in Appendix H.

Operational impact with highest significance is loss of avifauna species due to collision with overhead transmission lines. An Avifauna Impact Assessment was conducted and attached as Appendix F. Mitigation measures and a monitoring program are suggested in section 7.4.2.2. Other operational impacts include loss of biodiversity and habitat destruction of flora

during site maintenance (section 7.4.2.1), visual impact (section 7.4.2.3), waste management and ground and surface water pollution (section 7.4.2.4). General health and safety during maintenance of electrical equipment and general maintenance challenges in the unique climatic conditions are discussed in section 7.4.1.12 and 7.4.2.6.

Taking into consideration the size of the Project that will join an existing infrastructure corridor, the potential impact significance of the proposed OHTL on avifauna biodiversity is expected to be **moderate** before mitigation and **low** after mitigation.

The significance of the pre-mitigation visual impact of the proposed 132 kV OHTL on the area during the operational phase is expected to be **low** and will remain **low** during project life.

Waste management and pollution as well as natural resource usage can be mitigated to be **very low** to no significance if managed according to the EMP provided in Appendix H.

The project life of the Etanago-8 Uranium Mine is envisaged to be 14-17 years. The 132 kV OHTL, Substation and Metering will become the property of NamPower after 10 years and it is envisaged the OHTL will continue to be used as part of the West Coast electricity network.

The **cumulative effect** of any impacts associated with the proposed development are increased by the clustering of existing infrastructure in the Project area, including other power lines, the road and railway networks, pipelines, communication masts, as well as other developments such as mines. One cumulative impact that is being highlighted in the present study is the growing number of power lines being constructed, both transmission and distribution lines. Many of these converge at the Kuiseb Substation and Walmund Substation, thereby increasing the cumulative impacts, in particular of avifauna collisions, vegetation and habitat loss and visual impact. Ongoing monitoring is essential in order to identify the effectiveness of mitigation, and any need for additional intervention.

It is the conclusion of the Environmental Scoping Assessment that this Project has the potential to contribute positively to the Country's economic development. The Project has the potential to assist Bannerman Etanago-8 Uranium Mine to develop, while ensuring a security in the supply of electricity that enables the operation of the mine over the medium and long term.

The greatest potential negative impact is expected to be as a result loss of biodiversity through avifauna collisions to the OHTL.

Based on the project information as provided by the Proponent, Consulting Engineers and specialist inputs, the nature and extend of the Project, setting the sensitivity of the receiving environment, this scoping study concludes that there is currently no evidence indicating that any of the impacts identified (see sections 7.4.1 & 7.4.2) are of such significance that it cannot be reasonably mitigated and that the proposed Project, as presented in this report,

should not be allowed to continue. The findings of this scoping phase conclude that no further detailed assessments are required.

1 INTRODUCTION TO THE PROJECT AND THIS REPORT

This chapter of the report provides a background and motivation to the proposed Project; the study's terms of reference; study approach and methodology, purpose of this report; the assumptions and limitations of the study; and an outline of the remainder of the report.

1.1 PROPOSED PROJECT

Bannerman Mining Resources (Namibia) Pty. Ltd (the Proponent) is an Australian-based uranium company, invested in the Etangio-8 Uranium Project in Namibia. The Project received an Environmental Clearance Certificate from the Namibian authority through the Ministry of Mines and Energy in 2012. The Board of Directors has now approved the commencement of the Definitive Feasibility Study (DFS) on the Project with completion targeted for the September 2022 quarter.

The proposed Project covered in this Environmental Scoping Report entails the construction of a 132 kV Overhead Transmission Line (OHTL) and Substation with Metering Station to supply electricity to the planned Etanago-8 Uranium Project near Swakopmund.

The electricity supply will come from the Namibian Power Corporation (Pty) Ltd (NamPower) transmission network at the Kuiseb Substation 15 km east of Walvis Bay. The Kuiseb Substation has an existing spare 132 kV Feeder Bay that will be utilised for the supply to the proposed 132 kV OHTL. From here the 132 kV OHTL will run for 16,7 km in a northern direction parallel to and east of the existing two 220 kV OHTL to Walmund Substation, across the C28 Main Road for 3,4 km and then turn east for 4,9 km towards the NamPower metering station where it terminates at the Etanago-8 Uranium Project's Substation. A small line section is still required between the Metering Station and the mine's Substation, which will be located as close to the highest load as possible to reduce electrical losses. (*ADDIZA Power Consultants, 2021*)

Infrastructure for the generation and supply of energy (and associated activities) require an Environmental Clearance Certificate (ECC) before being implemented [Section 27(3) of the Environmental Management Act, No. 7 of 2007]. In accordance with the Environmental Management Act, (Act No. 7 of 2007) and within the framework of the Environmental Impact Assessment Regulations (2012), Urban Green cc (EAP) has been appointed by the Proponent to undertake an Environmental Scoping Assessment and apply for an Environmental Clearance Certificate for the construction of the electrical infrastructure necessary to connect the Etanago-8 Uranium Project to the Namibian grid.

1.2 NEED FOR AND DESIRABILITY OF THE PROJECT

Namibia, located in south-western Africa, is one of the world's top five uranium producing nations. It is an ideal uranium investment jurisdiction with political stability, security, a strong rule of law and an assertive development agenda. With a 45-year history of uranium

production and export, Namibia has become the world's fourth largest producer. Namibia has substantial mining infrastructure and support for uranium mining from both government and private sector.

The Etanago-8 Uranium Project is one of the world's largest undeveloped uranium projects. It now has a completed Definitive Feasibility Study (DFS) and environmental clearance and could be a top ten producer once developed. (*ADDIZA Power Consultants, 2021*)

The Etanago-8 Uranium Project is situated on the flat plains of the central Namib Desert, approximately 38 kilometres (by road) east of Swakopmund, and is well located for external infrastructure requirements including; road, rail, water, electricity and a deep water port. The development of the OHTL to feed electricity to the mine is required to commence with the development of the Etanago-8 Uranium Mine.

1.3 STUDY TERMS OF REFERENCE

No formal Terms of Reference (ToR) were provided, but rather were inferred from the requirements of the applicable legislation namely the Environmental Impact Assessment Regulations (Government Notice No. 30 of 2012), to enable an application for an ECC with the Environmental Commissioner, as required by Section 27(3) of the Environmental Management Act (No. 7 of 2007).

The purpose of this Study is to apply for an ECC for the 132kV Overhead Transmission Line and Etanago-8 Substation with Metering Station only. All other permits and/or licenses (see section 3.4) required for the operation of the proposed Project still needs to be applied for by the Proponent.

1.4 STUDY APPROACH AND METHODS

This EA process was carried out in accordance with provisions for EA, as prescribed by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), provided for by Section 56 of the Environmental Management Act (No. 7 of 2007).

The study's approach and methods were guided by the Terms of Reference (Section 1.3) and the relevant legislation (Chapter 3).

The EA process is a planning, design and decision-making tool used to inform the relevant authorities and Proponent on what the consequences of their decisions will be in biophysical and social terms. As such, it identifies potential impacts (negative and positive) that the Project may have on the natural and social environments; as well as identifying potential opportunities and constraints the natural and social environment may pose to the Project.

The steps followed as part of this EA process, are (i) registration of application for an ECC, and (ii) execution of a scoping assessment (content of this report). A flowchart indicating the process being followed is presented by Figure 1.4 below.

1.4.1 REGISTRATION OF APPLICATION FOR ECC

The first step followed as part of this EA process was to identify the listed activities potentially associated with the Project, as stipulated in the '*List of Activities that may not be undertaken without an Environmental Clearance Certificate*' (GN. No. 29 of 2012) and register the mentioned with the Office of the Environmental Commissioner.

The listed activities for which an ECC was initially applied for are:

“ENERGY GENERATION, TRANSMISSION AND STORAGE ACTIVITIES

The construction of facilities for -

1. (b) *the transmission and supply of electricity;”*

In accordance with Section 32 of the EMA, applications for an ECC should be submitted with the relevant Competent Authority, which for this Project was identified to be the Ministry of Mines and Energy and the Ministry of Environment, Forestry and Tourism (i.e. Approving Authority).

The Ministry of Mines and Energy was informed in writing on 17 September 2021 of the Proponent's intention to apply for an ECC with the Environmental Commissioner, with a copy of the application submitted with the office of the Environmental Commissioner with the Ministry of Environment, Forestry and Tourism as well as with NamPower and the Heritage Council. (Appendix A).

1.4.2 SCOPING STAGE AIMS

The next step followed as part of this EA process was the scoping assessment. The identification of potential impacts and their significance, as well as public consultation (as prescribed by Regulation 21 to 24 of the EIA Regulations (GN. No. 30 of 2012) are important elements of the scoping stage of a study. Hence, during the scoping stage issues/impacts that are likely to be significant are identified and those that are less significant are evaluated and if warranted, eliminated.

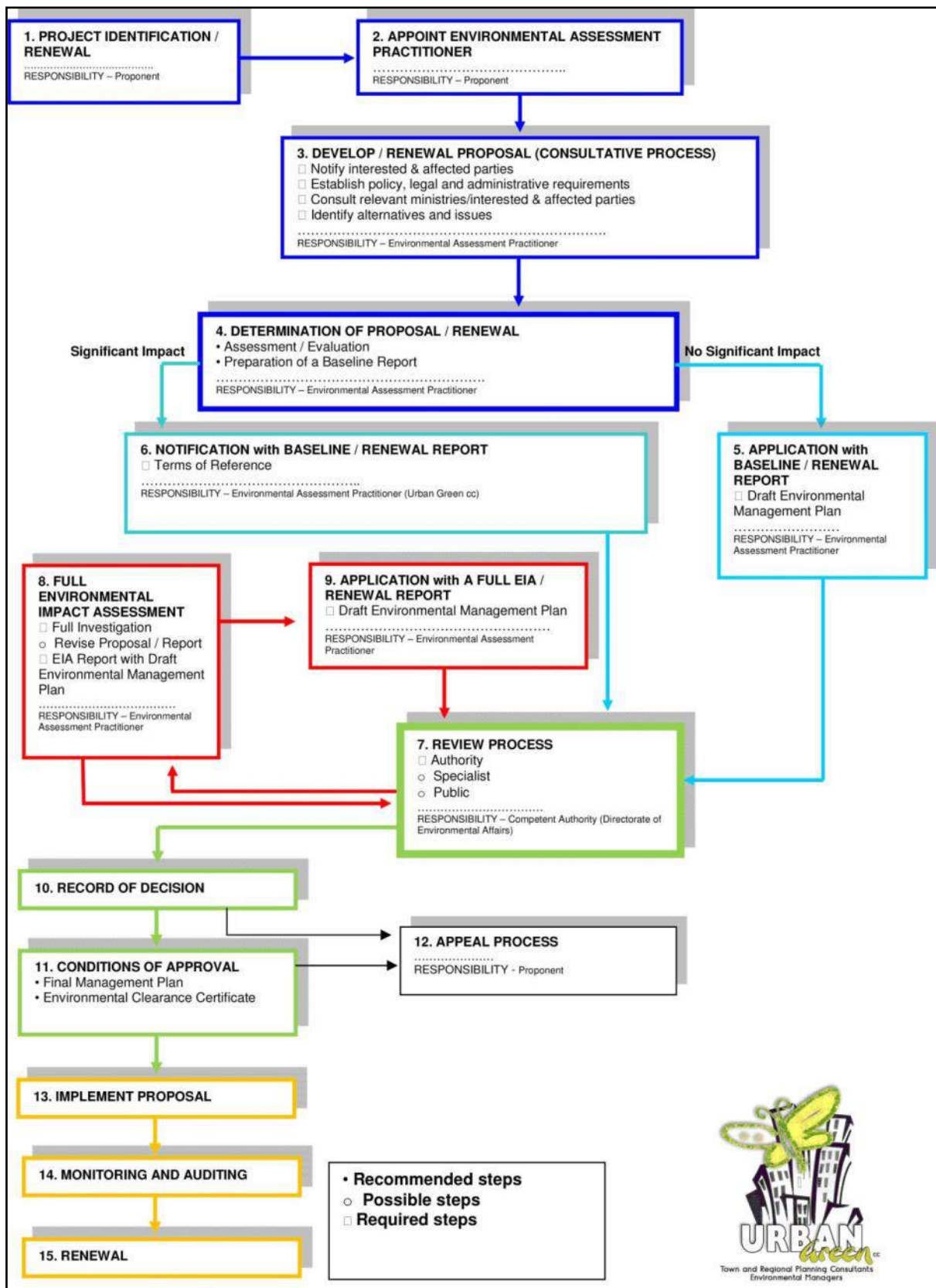


Figure 1.4: Diagrammatic representation of Namibia's Environmental Assessment process

1.4.3 SCOPING STAGE METHOD

The method followed during the scoping stage was as per the requirements set by the Environmental Impact Assessment Regulations (GN. No. 30 of 2012), which included –

- Giving notice to all potential interested and affected parties (I&APs) of the application (ECC application);
- Public consultation as per Regulation 21 which included the -
 - Opening and maintaining a register of all I&APs;
 - Receiving and recording of all comments and representations received from I&APs following the public consultation processes;
- Preparing a scoping report by subjecting the proposed application to scoping by -
 - Assessing the potential effects of the proposed listed activities on the environment (specialist studies also formed part of this stage);
 - Assessing whether and to what extent the potential effects identified can be mitigated and whether there are any significant issues and effects that require further investigation;
 - Identifying feasible alternatives related to the Project;
 - Setting the Terms of Reference for further investigations (if required);
 - Informing I&APs of the way forward in the EA process;
 - Ensuring informed, transparent and accountable decision-making by the relevant authorities; and
 - Inviting all registered I&APs to comment on the scoping report.
- Informing all registered I&APs of the decision of the office of the Environmental Commissioner.

1.5 SPECIALIST STUDIES

Given the nature of the activities associated with the Project and the sensitivity of the receiving environments, an Ecological Baseline Assessment (see Section 5.2), an Archaeological Baseline Assessment (see Appendix E) and Avifauna Assessment Study (see Appendix F) was conducted.

1.6 ISSUES AND CONCERNS RAISED, IDENTIFIED AND ASSESSED

During the screening stage, the following issues for further investigation was identified –

- Habitat destruction and alteration and disturbance of animal routes to water sources;

-
- Avian and bat collisions/electrocutions;
 - Destruction of possible Archaeological sites;
 - Electric and Magnetic fields of three Overhead Transmission Lines in one corridor;
 - Hazardous materials and waste management;
 - Occupational Health and Safety;
 - Civil Aviation obstruction of flightpaths;
 - Road Crossing permit required;
 - Visual and sense of place;
 - Land Use – Namib Naukluft Park, Dorob National Park and existing EPL's.

Concerns raised during the 1st round of public consultation are -

- The road next to Walmund sub-station is labelled incorrectly in the BID as the C26, it is in fact the C28.
- Archaeological assessment - as the area where the power line will be located could potentially have known sites or expected chance finds due to the abundant heritage in the area from the war times.
- Habitat disturbance - the known animal routes to water sources could also potentially be disturbed and will need to be assessed.
- Visual impact and sense of place - the influence on tourism should also be reviewed and potential offsets if required.
- Waste management - hydrocarbon & effluent management.
- Civil aviation - safety with regards to obstruction or interference of flightpaths. Specifically, requirement for aircraft warning spheres on spans at road crossings (span ahead, crossing span [over road], span after).
- Avifauna - (fatalities, injuries; species being the marine varieties including pink flamingo, seagulls, terns, etc.), as such bird diverters, anti-perching, and stringing visibility enhancement measures.
- All stayed/guyed structures require high visibility stay protectors, especially along known travel routes for vehicles.
- Metal corrosion and pollution management for line materials, components and structures (not meant in the sense of causing pollution, but rather polluting elements depositing on the power line due to environmental interaction/influence; such as dust deposits, corrosive deposits, wetting and moisture deposits, etc.). This usually necessitates frequent intervention to maintain the power line.

-
- Servitude management, primarily to deal with wash away, water erosion, wind erosion (expected) as well as sand deposits and dune management (expected to be of less concern along this route)

As a result, an Ecological and Archaeological Baseline Assessment as well as an AviFauna Impact Assessment were carried out as part of the scoping assessment. The Ecological Baseline Assessment confirmed and highlighted the following issues –

- Vegetation sensitivity in gravel plains that are covered in lichen fields, drainage lines that have endemic flora species and provides habitat for fauna and are flight paths for avifauna as well as rocky outcrops that is expected to have unique habitat.
- Avifauna sensitivity with collision of birds on existing power line structures will increase by additional power line obstruction.

These issues are discussed in detail in Chapter 7 in this Report. Mitigation measures and recommendations are provided in Section 7.4.

During the 2nd round of public consultation, the no additional comments were submitted, for inclusion into this Final Scoping Report.

1.7 PURPOSE OF THIS FINAL SCOPING REPORT

This Final Scoping Report (FSR) has been compiled as part of an assessment that has been undertaken for the development of the 132kV Overhead Transmission Line and Etanago-8 Substation with Metering Station. This FSR summarises the process followed to date, provides a description of the Project and addresses the issues raised by Interested and Affected Parties (I&APs) during both consultation opportunities. It further provides an assessment of the impacts of the proposed Project along with mitigation measures and recommendations.

The Draft version of this Report was made available for public review and comment from 2 to 9 December 2021, as required by section 23 of the Environmental Impact Assessment Regulations (GN. No. 30 of 2012). Comments received were included into this Final Scoping Report (FSR) submitted with the Ministry of Mines and Energy (i.e. Competent Authorities) and the Directorate of Environmental Affairs (i.e. Approving Authority) with the Ministry of Environment, Forestry and Tourism for decision-making.

After the DEA has reached a decision, all registered I&APs on the project database will be notified of the decision and the requirements of the statutory Appeal Period.

1.8 STUDY ASSUMPTIONS AND LIMITATIONS

In undertaking the EA and compiling the final scoping report, the following assumptions and limitations apply:

- It is assumed that all the information provided by the proponent, appointed consultants and authorities consulted, is accurate and that those aforementioned have disclosed all necessary information available;
- It is assumed that all permit or licence requirements, other than the ECC, associated with the Project will be addressed as separate investigations and are not included in this EA process;
- It is assumed that there will be no significant changes to the project (see Chapter 4) or the affected environment (see Chapter 5) between the compilation of this report and implementation of the Project that could substantially influence findings, recommendations with respect to mitigation and management, etc.;
- The EA process involved the assessment of impacts on the current conservation value of affected land and not on either the historic or potential future conservation value; and
- The assessment is based on the prevailing environmental (social and biophysical) and legislative context at the time of writing this report.

1.9 STRUCTURE OF THE REPORT

This report consists of nine chapters as outlined below.

Table 1.9 – Structure of the Report

SECTION	CONTENTS
Executive Summary	Executive Summary Provides an overview of the main findings of the Study.
Chapter 1	Introduction Provides a background and motivation to the proposed development; terms of reference; study approach and methods; the study assumptions and limitations; outlines the purpose, goals and structure of the Report. It also describes the procedure for submitting comment on the Study.
Chapter 2	Project Team and Expertise Provides an overview of the role-players participating in the project as well as their experiences.
Chapter 3	Legislations Applicable to the EA & Project Provides an overview of the key legislation having relevance to the environmental assessment and activities associated with the proposed project.
Chapter 4	Description of the Proposed Project Provides a description of the physical appearance of the proposed project, the technology intended to be used, land use, service infrastructure, construction and operation activities.

Chapter 5	The Affected Environment Describes the details pertaining to the site, the existing physical, biophysical, socio-economic environment of the study area.
Chapter 6	Details of the Public Participation Process Explains in detail the entire public consultation process followed as part of this study. Feedback received from registered Interested and Affected Parties and Stakeholders are listed as well.
Chapter 7	Assessment of Potential Impacts Describes and assesses the potential impacts of the proposed project. Mitigation measures relevant to the planning; design, construction and operational phases of the proposed solar park as appropriate and recommended.
Chapter 8	Conclusions and Recommendations Provides conclusions to the impact assessment and evaluates the overall suitability of the proposed solar park. Recommendations for implementation during the further planning, design, construction and operation of the proposed solar park are also provided, as appropriate.
Chapter 9	References Provides information on the information referenced in the document.

2 PROJECT TEAM

This chapter of the report provides an introduction and overview of the various role players on this Project and environmental assessment study, as well as the expertise and qualifications of the environmental consultants and specialists.

2.1 ROLE PLAYERS

The role players in this project are set out in Table 2.1.

Table 2.1 - The role players

ORGANISATION	PROJECT ROLE
Ministry of Mines and Energy – Electricity Control Board	Competent Authority
Ministry of Environment, Forestry and Tourism Directorate of Environmental Affairs	Decision-making authority for environmental authorization
Bannerman Mining Resources (Namibia) (Pty) Ltd	Proponent
Urban Green cc – Brand van Zyl	Independent Environmental Consultant (EAP)
Christina Tromp	Ecologist & Independent Environmental Consultant (EAP)
John Kinahan	Archaeologist
Mike and Ann Scott	AviFauna Specialists

2.1.1 PROPONENT

Bannerman Mining Resources (Namibia) (Pty) Ltd is an Australia-based uranium development company which has invested in the Etanago-8 Uranium Project.

2.1.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Urban Green Consultants cc is a multi-disciplinary consultancy, which has been offering innovative and environmentally sound solutions for over 17 years to private-, public- and NGO clients in Namibia. They offer professional services in Environmental Management, and Town and Regional Planning, as well as advice and products in the water and wastewater treatment industry.

2.2 EXPERTISE OF THE EAP AND EIA SPECIALISTS

The qualifications and expertise of the environmental consultants and specialists are set out in Table 2.2 below. The CV of the EAP appears in Appendix B.

Table 2.2 – Qualifications and expertise of the environmental consultants

NAME	Christina Tromp
RESPONSIBILITY ON THE PROJECT	EAP and Ecologist Ecological baseline assessment, impact assessment and mitigation formulation, reporting and application for Environmental Clearance
QUALIFICATIONS	M. Phil Degree in Environmental Management and Bachelor of Science Degree in Agriculture, majoring in Nature Conservation
PROFESSIONAL REGISTRATION	Environmental Assessment Professional Association of Namibia (EAPAN)
EXPERIENCE IN YEARS	12
EXPERIENCE	Christina Tromp is an educated environmentalist with work experience in the Namibian environment in Rural Development, Agricultural and Environmental sectors. She is a registered Environmental Assessment Practitioner. Her work experience was gathered in most regions of Namibia.
NAME	Brand van Zyl
RESPONSIBILITY ON THE PROJECT	EAP Public consultation, impact assessment and mitigation formulation, reporting and application for Environmental Clearance
QUALIFICATIONS	M. Degree in Environmental Management; M. Degree Town and Regional Planning; Bachelor of Arts Urban Geography
PROFESSIONAL REGISTRATION	Namibian Council for Town and Regional Planners Member of the Green Building Council of South Africa
EXPERIENCE IN YEARS	17
EXPERIENCE	Brand van Zyl has been involved in various Environmental Impact Assessment studies throughout Namibia and of different kind.
NAME	Mr John Kinahan
RESPONSIBILITY ON THE PROJECT	Archaeologist
QUALIFICATIONS	PhD University of the Witwatersrand, 1989
PROFESSIONAL REGISTRATION	N/A

EXPERIENCE IN YEARS	40
EXPERIENCE	John Kinahan is a research archaeologist who has worked wisely in Africa and is attached to several universities in southern Africa, the United Kingdom and North America. He has published more than 70 research articles which have been cited 1381 times and has a Google Scholar ranking of H18.
NAME	Anne and Mike Scott
RESPONSIBILITY ON THE PROJECT	Avifauna specialist
QUALIFICATIONS	Doctor Technologiae: Nature Conservation (Applied Ornithology); Bachelor of Arts; University Education Diploma; Post-graduate Diploma in Special Education: Remedial
PROFESSIONAL REGISTRATION	Environmental Assessment Professionals of Namibia (EAPAN; Ordinary Member practitioner, #71 HA Scott & #72 RM Scott) Full member of Namibia Chamber of Environment (NCE)
EXPERIENCE IN YEARS	Environmental impact studies - avifauna: 10 years
EXPERIENCE	Nature conservation: 40 years

3 LEGISLATION APPLICABLE TO STUDY AND PROPOSED PROJECT

The Constitution of the Republic of Namibia (1990) is the starting and guiding supreme legislation where the country commits itself to sustainable development through environmental protection and wise resource management. In support to the goal of sustainable renewable resource management, various international treaties and conventions have been agreed to by Namibia. For environmental protection and sustainable renewable resource management to the benefit of all, legislation from different spheres under control of different ministries have been adopted and enacted by Parliament.

There are several sectoral laws that fall under the general rubric of environmental laws. Sectoral laws are generally specific and apply to sectors such as mining, water, forestry and so forth. Any development, such as this, is expected to have certain impacts and would therefore have to comply with some or other legislative requirement/s before commencement.

This chapter provides an overview to the legislation that is applicable to both the assessment process and the various activities of the Overhead Power Line development. It is accordingly divided into:

- (i) International Treaties and Conventions;
- (ii) The Legal Framework for Environmental Management in Namibia;
- (iii) National Sectoral Legislative requirements applicable to the activities of the Project; and
- (iv) other relevant legislation and approvals required for the commencement of the Project.

3.1 INTERNATIONAL TREATIES AND CONVENTIONS

The international treaties and conventions applicable to the Project and affected environment worth taking note of are listed below in Table 3.1 below.

Table 3.1 - International Treaties and Conventions applicable

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
Convention on Biological Diversity 1992	Namibia is a signatory to the this legally binding instrument for the global conservation and sustainable use of biological diversity. Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected	Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised.

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
	<p>areas, with a view to ensuring their conservation and sustainable use.</p> <p>Promote the protection of ecosystems, natural habitats and the maintenance of viable populations of species in natural surroundings.</p>	
The United Nations Convention to Combat Desertification 1994	Focuses on land degradation in the dry lands where some of the most vulnerable ecosystems and people in the world exist.	The Project should adhere to responsible land management and rehabilitation, which contributes to the conservation and sustainable use of biodiversity and the mitigation of climate change.
Stockholm Declaration on the Human Environment 1972	Recognises the need for: <i>“a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment”</i> .	The proponent should strive to protection of natural resources and prevention of any form of pollution.
National Policy on Climate Change for Namibia 2011	Seeks to promote the primary government objectives, which include job creation, provision of basic services and infrastructure development, alleviation of poverty and provision of housing. These priorities are generally compatible with the principles of sustainable development as defined in the Rio Declaration of 1992.	Energy production adaptation works toward long-term energy security and energy efficient production technologies and decrease the dependence on non-renewable, volatile and environmentally unsound resources.

3.2 NAMIBIAN LEGAL FRAMEWORK FOR EIA

Several Namibian legislation and policies have environmental considerations with respect to the proposed Project. The instruments accounting for the legal framework for conducting an Environmental Assessment is listed in Table 3.2 below.

Table 3.2 – Namibian legislation applicable to the EA process

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
ENVIRONMENTAL ASSESSMENT LEGAL FRAMEWORK		
The Namibian Constitution (1990)	<p>Article 95 (1) states that “<i>the State shall actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at... maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of natural resources on a sustainable basis</i>”</p> <p>Article 100 stipulates that all natural resources are vested in the state, unless otherwise legally owned. The use of such resources is only allowed within reasonable limits and beyond such limits, permission should be obtained from a competent authority responsible for the use and governance of the concerned natural resources.</p>	The Project should support the provisions of the Namibian Constitution
Environmental Management Act (No 7 of 2007)	<p>Section 3(2) of the EMA provides a set of principles that give effect to the provisions of the Namibian Constitution for integrated environmental management.</p> <p>Section 27(3) stipulates that no party, whether private or governmental, can conduct a listed activity without an ECC obtained from the Environmental Commissioner.</p> <p>Section 40(1) stipulates that an ECC remains valid for a period not exceeding three years, subject to cancellation or suspension.</p>	<p>The Project should adhere to the principles provided in the EMA.</p> <p>An ECC should be obtained for the Project.</p> <p>The Proponent should renew the ECC (if granted) every three years. Renewal will be subject to adherence to EMP.</p>
EIA Regulations 2012 (GG No. 4878 GN No. 29 and 30)	Provides for the process to be followed in undertaking an EIA, stipulating particular requirements with regards to public consultation, the identification of impacts and establishing the significance thereof, as well as the content of an environmental scoping report.	The EA process should be undertaken as prescribed in the EIA Regulations.

3.3 NAMIBIAN SECTORAL LEGISLATIVE REQUIREMENTS

A number of Namibian legislation and policies have environmental considerations in respect of the proposed Project, as listed in Table 3.3 below.

Table 3.3 - Cross-sectoral legislation applicable to the project

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
NATIONAL SECTORAL LEGISLATION		
Nature Conservation Ordinance No. 4 of 1975, as amended (This Ordinance, will eventually be replaced by the (draft) Parks and Wildlife Bill)	Protects wild animals and indigenous plants in Namibia. Also governs the conservation of terrestrial birds Prohibits disturbance or destruction of the eggs of huntable game birds or protected birds without a permit. Requires a permit for picking (the definition of "picking" includes damage or destroy) protected plants without a permit. Prohibits the removal of and transport of various protected plant species.	The study area falls within an officially protected area proclaimed under the Nature Conservation Ordinance of 1975, namely the Namib-Naukluft Park. The project site may harbour some of the endemic, endangered and/or protected species as listed in Schedule 9 of the Ordinance. Permits are required for the removal of the listed species.
Forest Act No. 12 of 2001, as amended	Provision for the protection of various plant species. and of the environment. Prohibits the removal of and transport of various protected plant species.	The project site may harbour endemic, endangered and/or protected species Permits are required for the removal of these trees, bushes or shrubs, or any indigenous plants.
Soil Conservation Act No. 76 of 1969, as amended	Prevention and combating of soil erosion; conservation, improvement and manner of use of soil and vegetation, and protection of water sources.	The proposed Project's activities should adhere to the requirements as set in the Act.
Water Act No. 54 of	Makes provision for a number of functions	The Proponent should

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
1956, as amended	<p>pertaining to the management, control and use of water resources, water supply and the protection of water resources.</p> <p>Of importance is that the Act -</p> <ul style="list-style-type: none"> • Prohibits the pollution of underground and surface water bodies. • Liability of clean-up costs after closure / abandonment of an activity. 	<p>ensure that water use during the construction and operational phases are as sustainable as possible and that no pollution of any above and/or below ground water resource takes place.</p>
National Heritage Act (Act 27 of 2004), as amended	<p>The Act requires the identification of cultural and archaeological sites within the study area, registration and protection thereof.</p> <p>Heritage sites or remains are defined in Part 1, as “any remains of human habitation or occupation that are 50 or more years old found on or beneath the surface”.</p> <p>Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council.</p>	<p>All protected heritage resources (e.g. human remains etc.) discovered, need to be reported immediately to the National Heritage Council (NHC) and require a permit from the NHC before they may be relocated.</p>
Electricity Act of 2007	<p>The regulation of electricity transmission activities falls within the jurisdiction of the Ministry of Mines and Energy (MME). The act provides the requirements and conditions involved in obtaining licenses for the generation and provision of electricity. It also addresses the powers and obligation of the licensees and provides for incidental matters.</p>	<p>The Proponent will have to plan and operate in consultation with this Competent Authority.</p>
Hazardous Substances Ordinance No. 14 of 1974, as amended	<p>This ordinance provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant,</p>	<p>During the construction and operation phases, any hazardous waste needs to be handled, stored, and</p>

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
	strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. It is administered by the Ministry of Health and Social Services.	disposed of in a responsible manner and at appropriate waste sites.
Atmospheric Pollution Prevention Ordinance No 11 of 1976, as amended	Provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control and provides for the proclamation of dust control areas.	Excessive dust emissions caused during the construction and operational phases should be avoided or mitigated as it could be categorised as causing a public or environmental nuisance under common law.
Public Health Act No. 36 of 1919, as amended Health and Safety Regulations GN 156/1997 (GG 1617)	Section 119 states that “no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.”	The Project should both during the construction and operational phases consider and ensure proper human health and safety conditions.
Labour Act No. 11 of 2007, as amended	<p>The Labour Act (No. 6 of 1992), the New Labour Act (no. 11 of 2007) and Government Notice 156 of 1997: Labour Act, 1992: Regulations Relating to the Health and Safety of Employees at Work, governs working conditions of employees.</p> <p>These regulations are prescribed for among others safety relating to hazardous substances, exposure limits and physical hazards. Special consideration must be given to:</p> <ul style="list-style-type: none"> • Chapter 3: Welfare and Facilities at Work-Places • Chapter 4: Safety of Machinery • Chapter 5: Hazardous Substances • Chapter 6: Physical Hazards and general provision 	<p>The Proponent (including their appointed contractors) needs to comply with health and safety regulations pertaining to the health and safety of employees during construction.</p> <p>Operational activities should not result in any potential negative health implications to employees and/or larger community.</p>

STATUTE	PROVISIONS	DEVELOPMENT IMPLICATIONS
Namibia Civil Aviation Regulations (NAMCARs) of 2001, as amended in 2018	Stipulates the requirements for Obstacle Restrictions.	The OHTL may not interfere with aircraft operations to the Walvis Bay airport.
Namibia Civil Aviation Technical Standards – Aerodromes and Heliports (NAMCATS – AH)	No object higher than 45 m above the aerodrome elevation may be erected within a distance of 15 km from the aerodrome without written approval of the Executive Director of Namibia Civil Aviation Authority	It must be verified with the office of Namibia Civil Aviation Authority if permission for the erection of the OHTL must be obtained.
Road Traffic and Transport Act 52 of 1999 and its 2001 Regulations, as amended	<p>Provides for the control of traffic on public roads and the regulations pertaining to road transport, including the licensing of vehicles and drivers.</p> <p>Part 5 of the 2001 Regulations lays out detailed provisions pertaining to vehicle loads – i.e. types of loads and the appropriate manner in which loads for different vehicle classes should be carried.</p>	<p>All personnel and vehicles active during the construction and the operational phase should be appropriately licensed.</p> <p>Construction materials transported/delivered to the construction site should adhere to the requirements of the 2001 Regulations – i.e. should not exceed limits stipulated and should be transported in a safe manner.</p>
Minerals (Prospecting and Mining) Act No. 33 of 1992	To provide for the reconnaissance, prospecting and mining for, and disposal of, and the exercise of control over, minerals in Namibia; and to provide for matters incidental thereto.	EPL 7747, 6820, 3669 and MDRL 3345 is applicable to this proposed Project.

While it has been set out to list all those laws and regulations, which regulate the healthy functioning of the environment, it is not necessarily complete and the proponent has the responsibility to make themselves aware of all applicable legislation and permit requirements applicable to the Project.

3.4 AGREEMENTS, PERMITS, LICENCES AND/OR APPROVALS REQUIRED

The following agreements/permits and/or licenses (Table 3.4) should be concluded/obtained prior to construction.

Table 3.4 – Permits, licences, approvals and/or agreements that may also be required.

Activity	Type of Permit / Licence	Legislation / Institute
NamPower Agreement	Agreement on electricity infrastructure development and ownership	NamPower
Power Purchase Agreement	Contract for power supply.	Erongo RED
Finance Agreements	Debt finance	Namibian and other international financiers
Consent from affected parties for the registration of a servitude for the OHTL.	Permit for Namib Naukluft Park Permission from EPL owners	Ministry of Environment, Forestry and Tourism Directorate of Wildlife and National Parks Ministry of Mines and Energy Chamber of Mines
Environmental Clearance certificate	Environmental Impact Assessment in progress	Ministry of Environment, Forestry and Tourism
Service road along the OHTL	Approval required	Roads Authority
Road Crossing	Road Crossing Permit	Roads Authority Namibia Civil Aviation Authority
Evaluation of height of OHTL and distance from Walvis Bay Airport	FSS-AGA-FORM-032 Application	Namibia Civil Aviation Authority
Removal of protected and indigenous species	Permit if required	Ministry of Environment, Forestry and Tourism
Potable water supply	Contract required	NamWater

4 DESCRIPTION OF THE PROPOSED PROJECT

The proposed Project entails the construction, operation and maintenance of a 132 kV Overhead Transmission Line (OHTL) to supply electricity to the planned Etanago-8 Uranium Mine.

4.1 BACKGROUND INFORMATION

The uranium mineralisation at the Etanago-8 Uranium Project site was first discovered in the 1970s and Bannerman Mining Resources (Namibia) (Pty) Ltd started exploration on EPL3345 in mid-2006. Bannerman received Environmental Clearance in March 2010 for its plans to establish 'The Etanago-8 Uranium Project', a uranium mine. The Environmental Clearance was based on the Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plan (ESMP) which was conducted between October 2007 and December 2009. The Environmental Clearance for the location and design of infrastructure supplementary to the Etanago-8 Uranium Project (including an access road, a water pipeline and power lines) was granted by the Ministry of Environment and Tourism in July 2011.

Following further exploration and test work, Bannerman has expanded the mine design, it has selected the heap leach processing option and has altered the mine site layout. Bannerman then completed a Pre-Feasibility Study Update in December 2010 and these results were incorporated into an Amended ESIA completed in 2012. (*Speiser, 2012*) The Etanago-8 Uranium Project received environmental clearance from the Namibian authority (Ministry of Mines and Energy) for the Etanago-8 Uranium Mine during 2012 and all associated external infrastructure during 2014.

The Bannerman Board has now approved the commencement of a Definitive Feasibility Study on the Etanago-8 Uranium Project with completion targeted for the September 2022 quarter, which initiated the construction of the proposed 132kV OHTL, Etanago-8 Substation with Metering station and this Environmental Scoping exercise.

This chapter provides first of all a brief overview of the national strategies and policies relevant to the energy transmission sector, followed by a description of the project development, and implementation. The remainder of this chapter provides a detailed description of the proposed Project.

4.2 NATIONAL STRATEGIES & POLICIES

To address the increase in demand for electricity, and to complement NamPower's initiatives, the Ministry of Mines and Energy prepared a National Integrated Resource Plan for the next 20 years. The plan spells out the electricity generation projects Namibia could pursue to meet its growing electricity demand. MME further drafted the National Energy

Policy, Renewable Energy Policy and the Independent Power Producer Policy. These policies will help the country towards realising energy security in the future.

4.2.1 NATIONAL ENERGY POLICY

The National Energy Policy aims to “ensure the development of Namibia’s natural capital and its sustainable use for the benefit of the country’s social, economic and environmental wellbeing”. The Policy’s main goals are to ensure the security of all relevant energy supplies to the country; to create cost-effective, affordable, reliable and equitable access to energy for all Namibians; to promote the efficient use of all forms of energy; and to incentivise the discovery, development and productive use of the country’s diverse energy resources. The policy supports sustainable energy and exploration of low carbon developments. (*Ministry of Mines and Energy 2017*)

4.2.2 REGIONAL ENERGY SUPPLY

The Erongo Regional Electricity Distributor Company (Pty) Ltd, commonly known as Erongo RED, started trading in 2005, within the context of the Namibian Government’s National Development Plan. Erongo RED was formed by merging the service of electricity distribution from the various municipalities and town councils in the Erongo region namely: the Municipality of Walvis Bay, Swakopmund, Henties Bay and Omaruru; the Town Council of Karibib, Usakos and Arandis; Erongo Regional Council; and NamPower. The initiative to create REDs was part of the Electricity Supply Industry (ESI) and Electricity Distribution Industry (EDI) restructuring Policy to distribute and supply electricity through economies of scale, the pooling together of human and operational capital resources to ultimately stabilize electricity prices and ensure reasonable, affordable and cost effective tariffs to electricity consumers. (*Ministry of Mines and Energy 2017*)

The company purchases electricity from NamPower and the electricity is then transmitted and distributed to the various customer segments ranging from residential, business and industrial. Erongo RED uses about 21% of the total electricity requirement of Namibia.

4.2.3 WEST COAST ELECTRICITY NETWORK

The increase of industrial development in the Erongo Region in recent years following the “uranium rush” and development of the Walvis Bay harbour has led to an escalation in the demand for electricity. As a result, the Region’s transmission network has been subjected to increased pressure. This has necessitated NamPower to consider strengthening the West Coast network to provide for future load growth. Various transmission upgrading projects has been developed and commissioned or still being planned which include:

- Khan Substation: New Lithops 220kV feeder and Protection Modifications. Construction of 220kV 40MVar Capacitor Bank;
- Lithops Substation: Construction of 220kV Switching Station with 220kV Feeders to Walmund-Kuiseb, Rössing and Khan Substation and Reactor;

-
- Kuiseb Substation: New Lithops 220kV SF₆ feeder and Protection Modifications. Modifications to 220kV incoming Lines;
 - Rössing Substation: Protection Modifications on Walmund 220kV feeder;
 - Walmund Substation: Protection Modifications on Lithops 220kV feeder;
 - Kuiseb Substation: 220kV Walmund Feeder Bay;
 - OPGW retrofitting on Rössing - Lithops 220kV line;
 - Single Circuit 220kV Twin Pelican Khan- Lithops (+/-65km);
 - Dual Circuit 220kV Twin Pelican Lithops -Walmund (+/-40km);
 - Single Circuit 220kV Twin Walmund - Kuiseb (+/-17km);
 - Tie-in of Rössing/Walmund line to Lithops;
 - Kuiseb Substation: 220/132/33kV 160MVA Transformer and Busbar Upgrade;
 - Khan Substation: New Lithops 220kV feeder and Protection Modifications. Construction of 220kV 40MVar Capacitor Bank;
 - Lithops Substation: Construction of 220kV Switching Station with 220kV Feeders to Walmund-Kuiseb, Rössing and Khan SS and Reactor;
 - Kuiseb Substation: New Lithops 220kV SF₆ feeder and Protection Modifications. Modifications to 220kV incoming Lines;
 - Rössing Substation: Protection Modifications on Walmund 220kV feeders;
 - Walmund Substation: Protection Modifications on Lithops 220kV feeder;
 - Kuiseb Substation: 220kV Walmund Feeder Bay;
 - OPGW retrofitting on Rössing - Lithops 220kV line;
 - Single Circuit 220kV Twin Pelican Khan- Lithops (+/-65km);
 - Dual Circuit 220kV Twin Pelican Lithops -Walmund (+/-40km);
 - Single Circuit 220kV Twin Walmund - Kuiseb (+/-17km);
 - Tie-in of Rössing/Walmund line to Lithops;
 - Kuiseb Substation: 132kV Etanago-8 Feeder Bay;
 - Etanago-8 Metering Station: Infrastructure;
 - Etanago-8 Metering Station: 132kV Feeder Bay;
 - ± 25 km 132 kV self-supporting steel monopole OHTL from Kuiseb SS - Etanago-8 Metering Station.

The mine shall construct, own, operate and maintain the 132/11 kV Etanago-8 Substation. With the upgrading of the West Coast network of the Erongo Region an existing spare 132

kV Feeder was available at the Kuiseb Substation. The construction timelines of NamPower for the electricity infrastructure to Etanago-8 Substation will not meet the stringent timeline requirements of the Etanago-8 Uranium Mine, once the project reach financial close. It is thus proposed that the Mine construct the necessary NamPower shallow connection infrastructure and hand it over to NamPower at completion. This will allow the Mine to control the construction period and project costs. All customer funded electrical infrastructure assets are deemed to be “national assets” 10 years after commissioning and hand-over to NamPower. (*ADDIZA Power Consultants, 2021*)

4.3 DESCRIPTION

The proposed Project addressed in this Environmental Scoping Report entails the -

- Installation of a 132kV Feeder Bay at the existing Kuiseb Substation;
- Construction of a 132kV substation (Etanago-8 Substation) at Bannerman Resources Mine;
- Construction of a 132 kV metering station (Etanago-8 Metering Station) at Bannerman Resources Mine; and
- Construction of a 132 kV self-supporting steel monopole overhead line from Kuiseb Substation to the proposed Etanago-8 Substation; as explained in more detail below.

4.4 LOCALITY AND ALIGNMENT

The proposed Project Site falls within the central western parts of Namibia approximately 25 km inland from the Atlantic Ocean. The Etanago-8 Uranium Project is located within the Namib Desert in the Erongo Region, 25km south-east of Swakopmund. Refer to Figure 4.1 for the locality map.

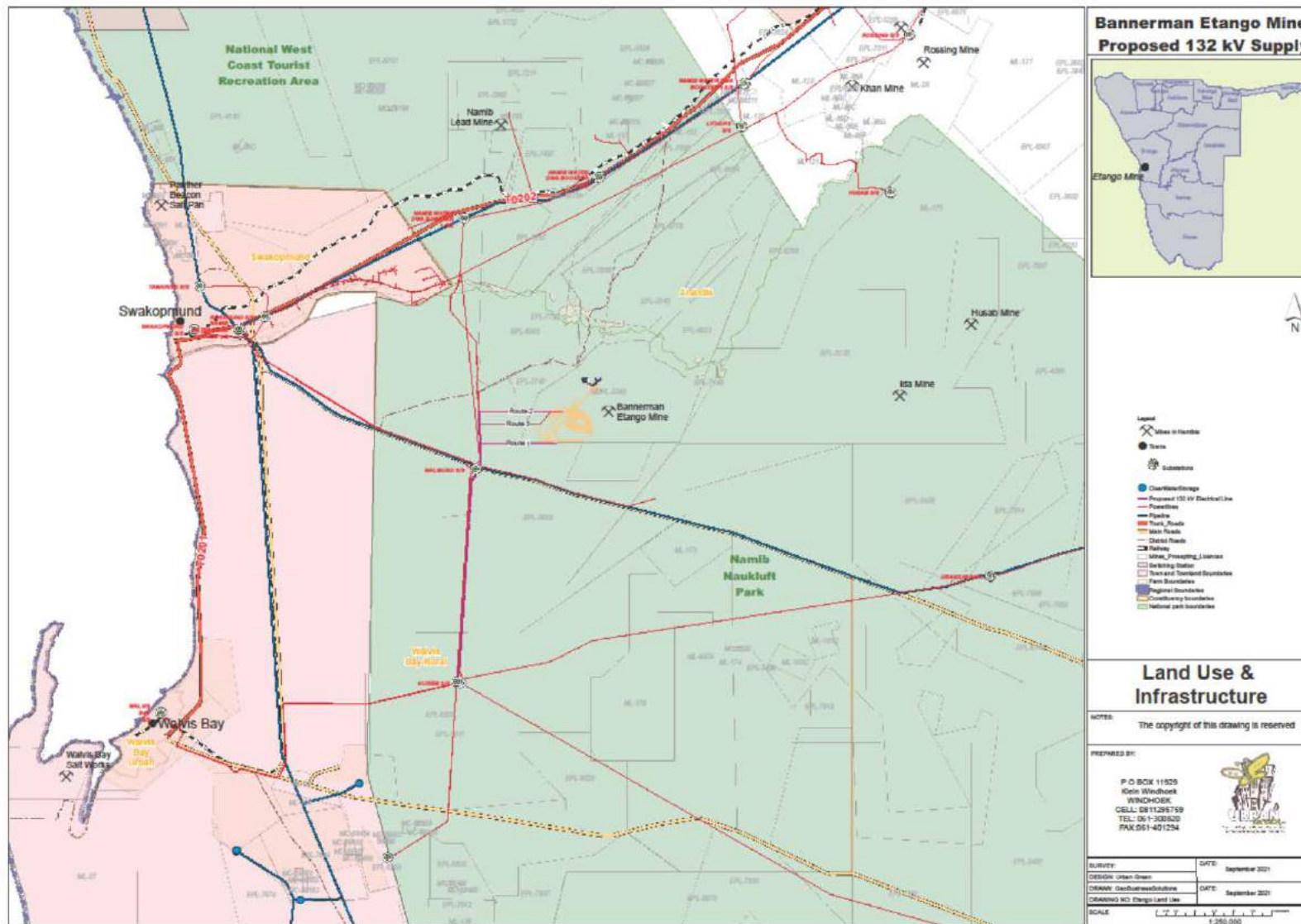
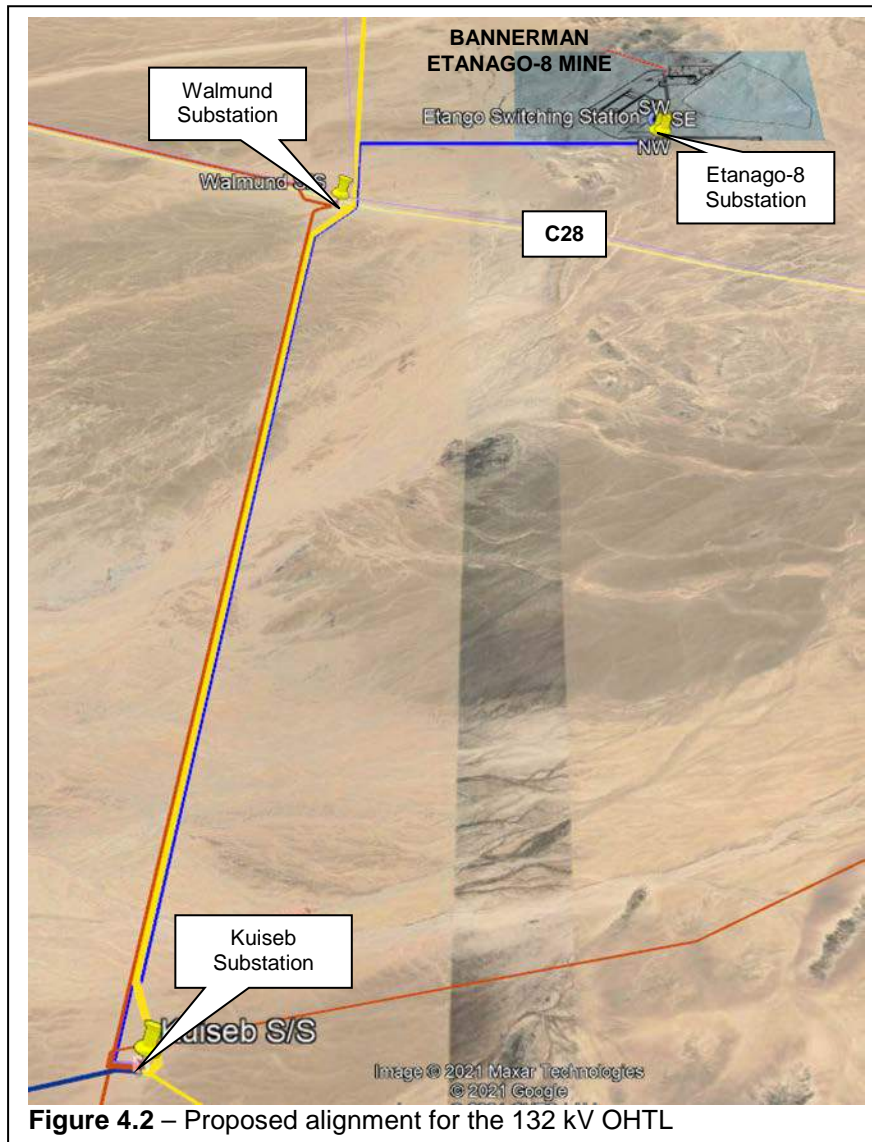


Figure 4.1 – Locality and Alignment of the proposed 132 kV Overhead Transmission Line

4.4.1 ROUTE ALIGNMENT OF TRANSMISSION LINES

The designed route, ± 25 km in length, will extend from the existing Kuiseb Substation into a northerly direction past the existing Walmund Substation and terminate at the Bannerman Etanago-8 Project's proposed substation (i.e. Etanago-8 Substation), as indicated by Figure 4.2 below. The proposed 132kV OHTL will run parallel for the larger part of the route with the existing two 220kV lines (yellow lines) and to the east thereof.



In the southern part (from Kuiseb Substation to Walmund Substation; 16.7 km), the proposed 132 kV steel monopole transmission line will be offset (to the east) from the existing 220 kV Kuiseb – Lithops 1 and 220 kV Kuiseb – Walmund 1 transmission lines, with the 66 kV Walmund Ruby 1 and 66 kV Walmund Ruby 2 to the west. The proposed two 132 kV Kuiseb – Sekelduin steel monopole transmission lines will run on the west of the two existing 66 kV wooden five-pole (Kamerad) lines. (*Scott&Scott, 2021*)



Photo 4.4.1 – Existing two 220 kV and two 66 kV OHTL between Kuiseb and Walmund Substations (viewed north to south)

(Source: African Conservation Services cc, 2021)

In addition, the process for the construction of two further 132 kV stele monopole transmission lines in the same servitude has already been initiated. (*Scott & Scott 2021*) These lines will run to the west of the two existing 66kV structures, from Kuiseb Substation to the new Sekelduin Substation to the north-west (via, but not lined to Walmund Substation). Once completed, the result will thus be a total of seven transmission lines running in parallel from Kuiseb Substation to Walmund Substation.



Photo 4.4.2 – Existing two 220 kV and 22 kV transmission lines north of Walmund Substation (viewed south to north)

(Source African Conservation Services cc, 2021)

Details of some of the main power lines associated with the proposed new 132 kV OHTL as given in Table 4.1 (*credit to African Conservation Services*) below:

Table 4.1 - Main power lines associated with the proposed new 132 kV OHTL.

Status	Power line name	kV	Main pole/ tower structure	Tower height above ground (m)	Ground clearance (mid-span; m)	Span length (m)
Kuiseb - Etanago-8						
Proposed	1. Kuiseb – Etanago-8	132	Single circuit Self-supporting steel monopole	20.6	6.3	250 – 300
Kuiseb - Walmund						
Proposed	2. Kuiseb – Sekelduin 1	132	Single circuit Self-supporting steel monopole	19	6.3	250-300
Proposed	3. Kuiseb – Sekelduin 2	132	Single circuit Self-supporting steel monopole	19	6.3	250-300
Existing	4. Kuiseb – Lithops 1	220	Single circuit Guyed steel monopole	30.8 – 39.8	6.7	400
Existing	5. Kuiseb – Walmund 1	220	Single circuit Guyed steel monopole	30.8 – 39.8	6.7	400
Existing	6. Walmund – Ruby 2 (with Langer Heinrich T-off near Kuiseb S/S)	66	Wooden five-pole (Kamerad)	13	5.7	180-200
Existing	7. Walmund – Ruby 1	66	Wooden five-pole (Kamerad)	13	5.7	180-200
(Existing) (Walmund to Sekelduin will be dismantled)	(8 & 9. Walmund – Swakopmund 1 & 2; to west)	66	Wooden five-pole (Kamerad)	13	5.7	180-200
Walmund – Lithops						
Existing	10. Kuiseb – Lithops 1 11. Lithops – Walmund 1	220	(One) double circuit structure Guyed steel lattice (already mitigated from Swakop River to D1991 road)	33.4 – 42.4	6.7	400
Existing	12. Walmund – Swakop River (distribution network)	22	Wishbone (wooden monopole)	9.2	5.1 – 5.3	100

(*note that measurements serve as a guideline only)

4.4.2 KUISEB SUBSTATION

The Kuiseb Substation (see Photo 4.4.3), 15 km north-east of Walvis Bay has an existing spare 132 kV Feeder Bay that will be utilised to supply the proposed 132kV OHTL.

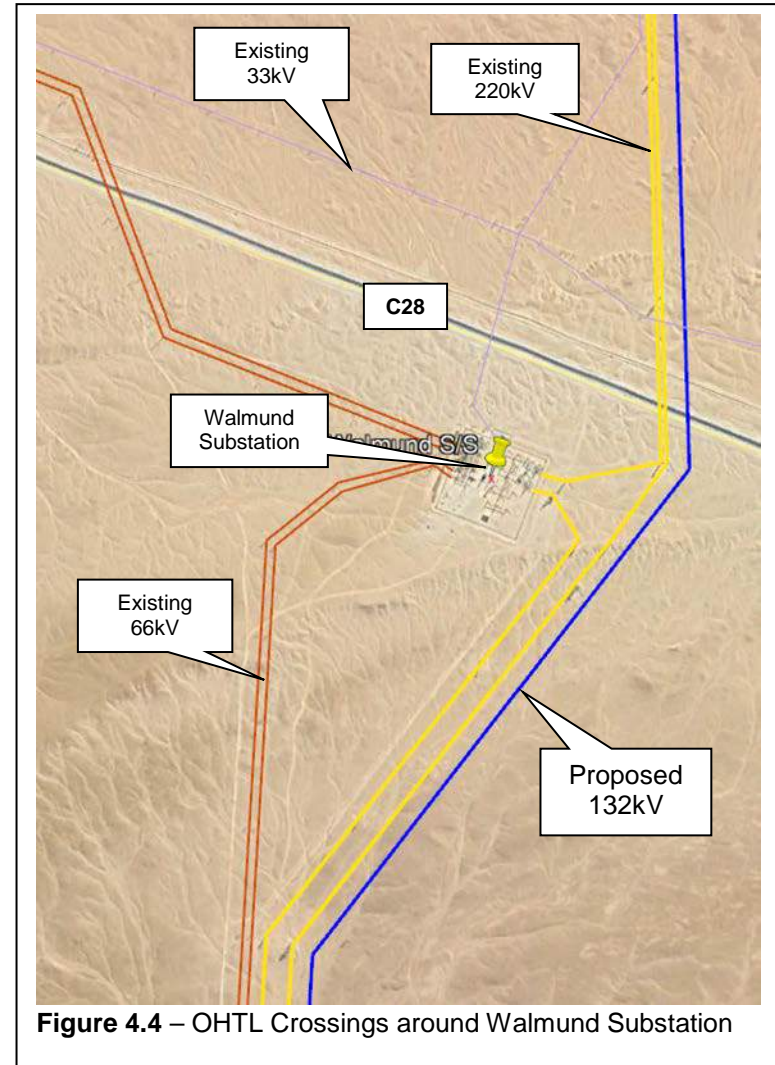
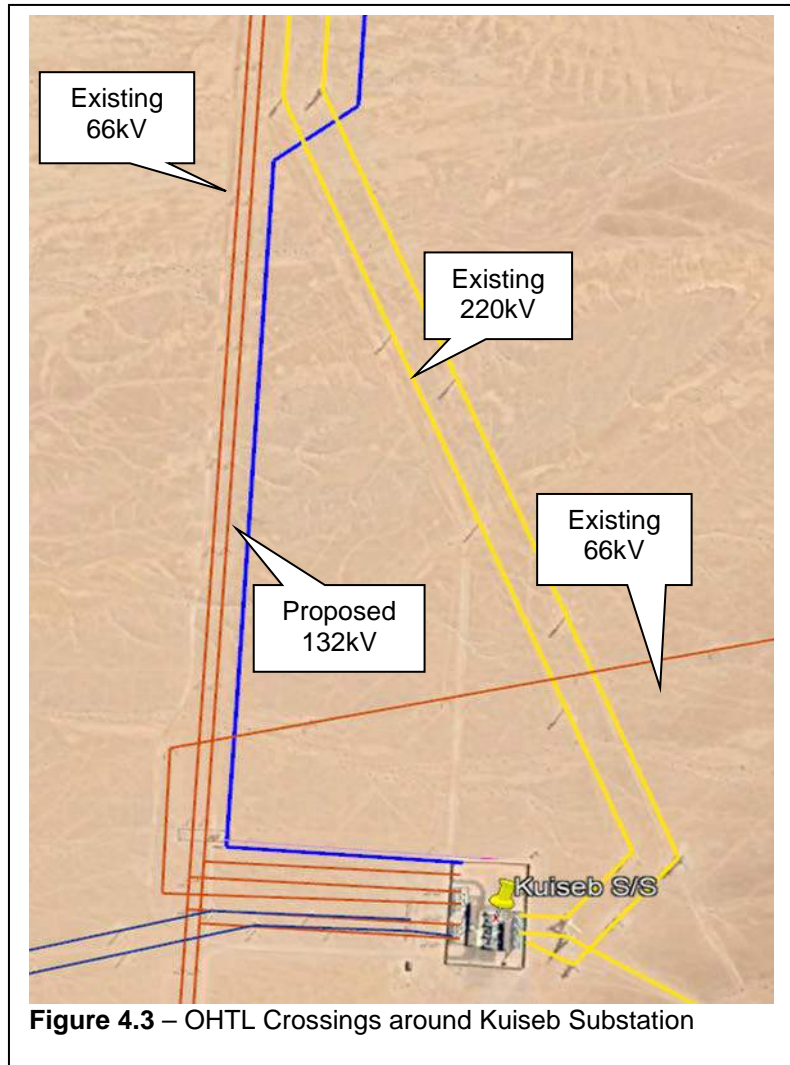


The infrastructure around the Kuiseb Substation is fairly congested and complex as both the existing 220kV line (yellow lines) and existing 66kV (orange lines) extends from this Substation. This situation necessitates that the proposed 132kV OHTL must cross the existing OHTLs, as indicated by Figure 4.4.3 below.

4.4.3 WALMUND SUBSTATION

The line will pass through the Walmund Substation (see Photo 4.4.4) The infrastructure around the Walmund Substation is also somewhat congested with various overhead lines, as indicated by Figure 4.4 below. In this instance only the smaller existing 33kV Erongo Red OHTL (purple line) needs to be crossed by the proposed 132kV OHTL. It is at this same point where the proposed 132kV OHTL will cross the C28 road, as indicated by Figure 4.3.

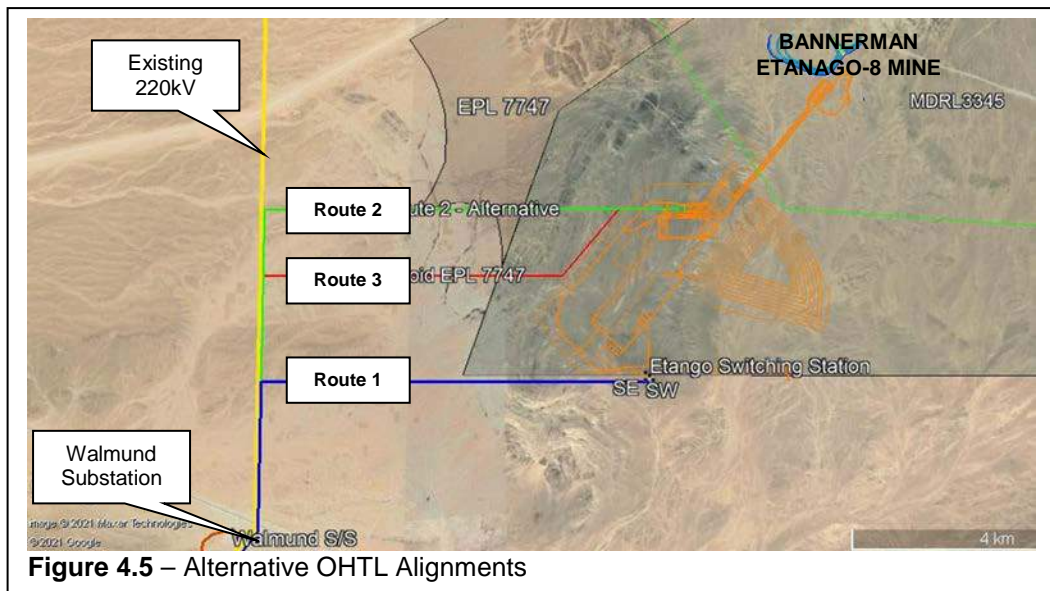




The proposed 132kV OHTL will cross the C28 road near the existing Walmund Substation at the same crossing as the existing 220kV line (see Figure 4.4), for which a road crossing permit will be obtained from the Roads Authority.

North of Walmund Substation (from 2 km up to 4.4 km northwards), the proposed 132 kV OHTL will be offset (to the east) from the existing 220 kV Kuiseb - Lithops 1 and 220 kV Lithops – Walmund 1 transmission lines (in one double circuit steel lattice transmission structure, the poles of which are guyed), with the 22 kV "wishbone" wooden pole distribution line to the west/left (see Photo 4.4.2)

For the section of the proposed 132kV OHTL alignment extending from the 220kV OHTL eastwards, alternative routes were considered, as indicated by Figure 4.5 below. Route 3 option was chosen for reasons discussed in Section 4.9.



4.4.4 ETANAGO-8 SUBSTATION

The proposed Etanago-8 Substation will be located within the Bannerman Etanago-8 Uranium Project area, as close to the highest load as possible to reduce electrical losses. It will transfer power from the transmission system to the distribution system of the mine. It will include transformers to change voltage levels from the 132kV to 11kV.

The substation will be an open station fenced-in (2.4m high) with controlled access to authorised personnel only. It will contain components such as switching, protection and control equipment, and transformers.



Photo 4.4.5 – Example of the substation to be constructed

Photo 4.4.5 gives an idea of the size that the Etanago-8 Substation will be. The footprint of the substation will be 4 080m² (68m x 60m) located in the area as indicated in Photo 4.4.6.



Photo 4.4.6 – Envisaged location of the Etanago-8 substation

Presently an outdoor configuration is proposed, but extra precaution and measures will be taken considering the corrosive conditions of the area. These include amongst other:

- (1) extra galvanising;
- (2) marine protection for all equipment; and
- (3) Installing wind shields to protect the substation and especially the 132/11kV Transformers from the prevailing south-westerly wind.

4.4.5 METERING STATION

The proposed Etanago-8 Metering Station will be located at the point along the proposed 132kV OHTL where the OHTL enters the Etanago-8 Uranium Mine area. It will be constructed under the proposed 132 kV OHTL just outside of the mine security fence for easy access to the metering station by NamPower personnel.

The proposed metering station will be approximately 22m x 22m in extent and fenced-in with a 2.4m high security fence with controlled access to authorised personnel only. Please refer to Appendix B for a diagram of the specifications for the metering station.

4.5 INFRASTRUCTURE DESIGN AND SPECIFICATIONS

4.5.1 SPECIFICATION OF OVERHEAD TRANSMISSION LINE (OHTL)

The physical infrastructure consists of a single-circuit 132kV overhead line fixed to galvanized steel (S355JR) monopole structures.

The structures are a combination of freestanding intermediate steel monopole structures (see Photo 4.5.1) and angle steel monopole structures (to be stayed) at bends (see Photo 4.5.2), designed according to SANS10280:2017 (IEC60826).

An H-structure pole design (see Photo 4.5.3 below) will be used exiting the Kuiseb Substation and when entering the Etanago-8 Substation to align the overhead cables with the configuration of the horizontal aligned infrastructure.



Photo 4.5.1 - View of single-circuit freestanding monopole structure



Photo 4.5.2 - View of single-circuit angle steel monopole structures (to be stayed)



Photo 4.5.3 - View of H-structure pole design (to be stayed)

The monopole structures will be secured by means of a concrete foundation casted around the footing of the pole structure of a dimension of 3m (depth) x 2.4m (width) x 2.4m (width). Foundations will be embedded with 50mm concrete cover for corrosion protection.

The angle poles will be anchored with 8 x 12mm galvanized steel wires to which a yellow uPVC warning pipe is installed for visibility. A single Pelican ACSR (greased) conductor will be installed on these steel monopoles with Line Post insulators on the suspension structures and Long-rod tension insulators on the bend or terminal poles. The line will be equipped with a single 48FO Single Mode Fibre (SMF) Optical Ground Wire (OPGW) at the top of the monopoles to provide the communication between substations and lightning protection for the conductors below (*ADDIZA Power Consultants, 1 July 2021*).

A lightning spike is situated at the top of the pole to attract the lighting to the pole in order to avoid strikes on the conductor and shield wire. A 7 x 4mm GSW pole earth wire will be attached to the bottom of the pole at an earth lug attachment point.

The monopole structures are 23.2m in length of which 2.6m will be underground, resulting in an above ground structure of 20.6m in height. The pole is equipped with climbing steps for maintenance. These lugs start 5m above ground level and continue all the way up to the top.

The span width between the monopole structures will be approximately 250 to 300m. Aircraft warning spheres (600mm diameter) will be installed at all major road, highway or freeway crossings. This is to make the line visible to approaching aircraft in the event of an emergency landing. Double loop bird flight diverters (BFD) will be added to the line at sensitive locations to avoid bird collisions (*TCS Transmission Consulting Services, 28 August 2020*).

The OHTL design will meet and possible exceed, where necessary, all SANS 10280 standards and specifications (latest edition).

The Technical Submission Report from ADDIZA Power Consultants is available from the offices of Urban Green cc.

4.5.2 OVERHEAD TRANSMISSION LINE SERVITUDE

The servitude of the proposed powerline as well as that of the existing two powerlines are based on NamPower's prescribed servitude widths. (See Appendix C) The required servitude width of the 132 kV OHTL centreline is 25m to either side, i.e. it should be 50m in total. In this instance the distance between the proposed 132kV OHTL and the existing 220kV OHTL must be 31m. The distance between the two existing 220 kV running parallel to each other is also 31m with. To the west of the two 220 kV OHTL the servitude between the 220 kV OHTL and the next 66 kV OHTL should be 25 m and the servitude to the next 66kV line must be 17 m. To the west of this OHTL corridor must be a servitude of 11 m.

The total width of the combined servitudes within this corridor will thus add up to 140 m.

4.5.3 SUPPORTING INFRASTRUCTURE

(i) Access Roads

Access to the Bannerman Etanago-8 Project and Etanago-8 Substation will be obtained via the C28 road that extends from Swakopmund to Windhoek, and services the Langer Heinrich Mine. The C28 is located approximately 5 km to the south of Etanago-8 Project Site; and access to the mine from the C28 will require the construction of a 7km spur road in a northerly direction. An appropriate traffic control system will be established at the intersection of the access road with the C28.



Photo 4.5.4 – Access road to Etanago-8 Uranium Project and Substation from the C28

(ii) Water

Water for the construction will come from the desalination plant north of Swakopmund. The plant was constructed by Areva to provide water to the Trekkopje Uranium mine. Since the start of the mine's operations has been postponed, a contract was signed with NamWater for the distribution of water to other uranium mines in the Erongo region. Currently Rio Tinto's Rössing, Paladin Energy's Langer Heinrich and Swakop Uranium's Husab mines receive water from this desalination plant. It is envisaged that water will be trucked to the Project Site during the construction phase. (*pers. comm. Werner Evans*)

Water is required for the concrete foundation casted around the footing of the monopole structures with a dimension of 3m (depth) x 2.4m (width) x 2.4m (width) and for the casting of foundations for the Etanago-8-8 Substation and Metering Station. Although sufficient amount of water is available from the desalination plant, it will be delivered on site at a high cost.

(iii) Waste Management

The municipalities of Swakopmund and Walvis Bay have confirmed in previous SEMP reports that their landfill sites have enough space for at least 20 years. A hazardous waste facility exists in Walvis Bay, which is the only one in the coastal area. This hazardous waste facility must be used to remove any possible hazardous waste from the construction site. (*Ministry of Mines and Energy, 2021*)

Waste recycling has become common practice at the central coast. The municipalities of Walvis Bay and Swakopmund, as well as the uranium mines in the vicinity employ functioning waste management systems to reduce the volume of waste that would otherwise end up on municipal landfills. (*Ministry of Mines and Energy, 2021*) Recyclable materials should be taken to the recycling depots at either Swakopmund or Walvis Bay where they are sorted and sent for further processing.

4.6 CONSTRUCTION PHASE

Construction of the proposed OHTL is expected to take ± 12 months and will involve the following tasks:

- Setting-out of the alignment of the OHTL, poles' locality and metering station;
- Setting-out of the temporary construction camp and laydown area for infrastructure and equipment (no temporary accommodation and amenities for construction workers are allowed within the Park);
- Clearing of vegetation at the point where concrete base for pole structures will be casted (if so required);
- Clearing of vegetation within the boundaries of the temporary construction camp with laydown area;
- Transportation of construction material (i.e. steel mono poles, conductors, insulators, etc.) and storage at temporary construction camp;
- Digging of holes of 3m (depth) x 1.4m (width) x 1.4m (width) for the monopole structures' with a drill or TLB, depending the underground conditions;
- Placement of monopole structures within the excavated areas and backfilled with concrete and anchoring;
- Once the concrete base is dry, insulators will be fixed to the monopole structures and conductors strung between poles making use of human labour and machinery;

-
- Connection to substation and metering station and commissioning; and
 - Rehabilitation of the disturbed areas.

Construction of the proposed substation and metering station is expected to take ± 18 months and will involve the following tasks:

- Clearing of vegetation for the extend of the site;
- Fencing of the site and provision of controlled access;
- Transportation of construction material and equipment, and storage at temporary construction camp;
- Digging of trenches, excavations and casting of foundations;
- Installation of equipment;
- Applying final grade to the site;
- Testing and commissioning; and
- Clearing of site.

The impacts expected to occur during the construction phase, the assessment therefore and the mitigations recommended are discussed in more detail in Section 7.4.1, while the environmental requirements are listed in much detail within the Environmental Management Plan (EMP), attached in Appendix H.

4.7 OPERATIONAL PHASE

Some of the typical operational phase activities might include the following:

- Clearance of vegetation along the power line servitude and within the fenced-in area of the substation and metering station site;
- Bi-monthly inspections to check for signs of wear and tear, which is done by foot and vehicle;
- Replacement of damaged or malfunctioning infrastructure; and
- Emergency maintenance.

The impacts expected to occur during the operational phase, the assessment therefore and the mitigations recommended are discussed in more detail in Section 7.4.2, while the environmental requirements are listed in much detail within the Environmental Management Plan (EMP), attached in Appendix H.

4.8 DECOMMISSIONING

The project life of the Etanago-8 Uranium Mine is envisaged to be 14-17 years. On mine closure, it is anticipated that no future alternative land uses are likely to be considered as the mine is within the Namib Naukluft National Park. (*Speicer, 2012*) The 132 kV OHTL will become the property of NamPower after 10 years and it is envisaged the OHTL will continue to be used as part of the West Coast electricity network. (A)

If the proposed 132 kV OHTL from Walmund Substation will not form part of the regional electricity network, it will be the responsibility of the Proponent to undertake the decommissioning, which will be done as per the Proponent's Decommissioning & Rehabilitation Plan. It is recommended that a Botanist and Ecologist be involved to advice on how to go about restoring the servitude area to its original condition.

A complete decommissioning exercise, which should be covered by the Decommissioning & Rehabilitation Plan should involve as a minimum:

- Demolishing and removal of all temporary and permanent structures;
- Disposing of building rubble;
- Preparation of disturbed areas and recovery of biological soil crust;
- Search and relocate of local indigenous vegetation onto the site;
- Rehabilitated vegetation patch; and
- Rehabilitation monitoring.

4.9 ALTERNATIVE SITES & ALIGNMENTS CONSIDERED

4.9.1 RENEWABLE ENERGY SOURCES

Since the West Coast electricity network of the Erongo Region has been upgraded and an existing spare 132 kV Feeder was available at the Kuiseb Substation, alternative sources of renewable energy was not considered, given large scale of the proposed uranium mine and the stringent time line requirements of the mine development.

4.9.2 UNDERGROUND CABLING

Underground cabling would have no impact with regard to bird collisions or electrocutions. However, this option would work only for relatively low voltages, and not for long distances. This form of cabling was therefore not considered a feasible option. (*Scott&Scott, 2021*)

4.9.3 ROUTE ALIGNMENT

The alternatives for the OHTL alignment were considered according to the following criteria:

-
1. project costs of different alignments;
 2. least environmental impact;
 3. easy access to the metering station for NamPower personnel and technicians;
 4. the Etanago-8 Substation must be located close to the highest load as possible to reduce electrical losses; and
 5. Avoidance of existing EPL's that might hinder access to and maintenance of the OHTL.

The alignment of the OHTL from Kuiseb Substation through Walmund Substation up to the point where the OHTL will turn east, will follow the existing infrastructure corridor that was already constructed within the Namib Naukluft Park. Impairment of the environment was already done here and servitudes and access roads exist for two 220kV OHTLs that run from Kuiseb substation to Walmund and Lithops Substations respectively. It is the believe that least virgin land within the Namib Naukluft Park will be affected if this existing corridor be re-used as far as possible.

The lay-out for the Etanago-8 Uranium Project was already fixed based on the EIA that was completed in 2012. The alignment of the 132 kV OHTL from the point north of Walmund Substation east towards Etanago-8 Substation and Metering station were considered taken the given criteria into consideration. (see Figure 4.5 and 4.6) Three options transpired:

4.9.3.1 Route 1

Route 1 (blue line) would enter the Etanago-8 Uranium Mine on its southern boundary. However, the substation must be located more to the central part of MDRL 3345 to be close to the highest load. This option would mean that the substation and metering station be too far apart.

4.9.3.2 Route 2

Route 2 (green line) was then studied, since this would mean that the Etanago-8 Substation and Metering station would be close together on the western part of MDRL 3345. Route 2 would, however, traverse EPL 7747 which might hinder free access to the proposed OHTL for NamPower personnel and technicians.

4.9.3.3 Route 3

Route 3 (red line) was then decided on, because it met all requested criteria.

The route alignment was further studied during the screening and scoping phases, which included public consultation with I&APs and Authorities. (See Figure 4.6).

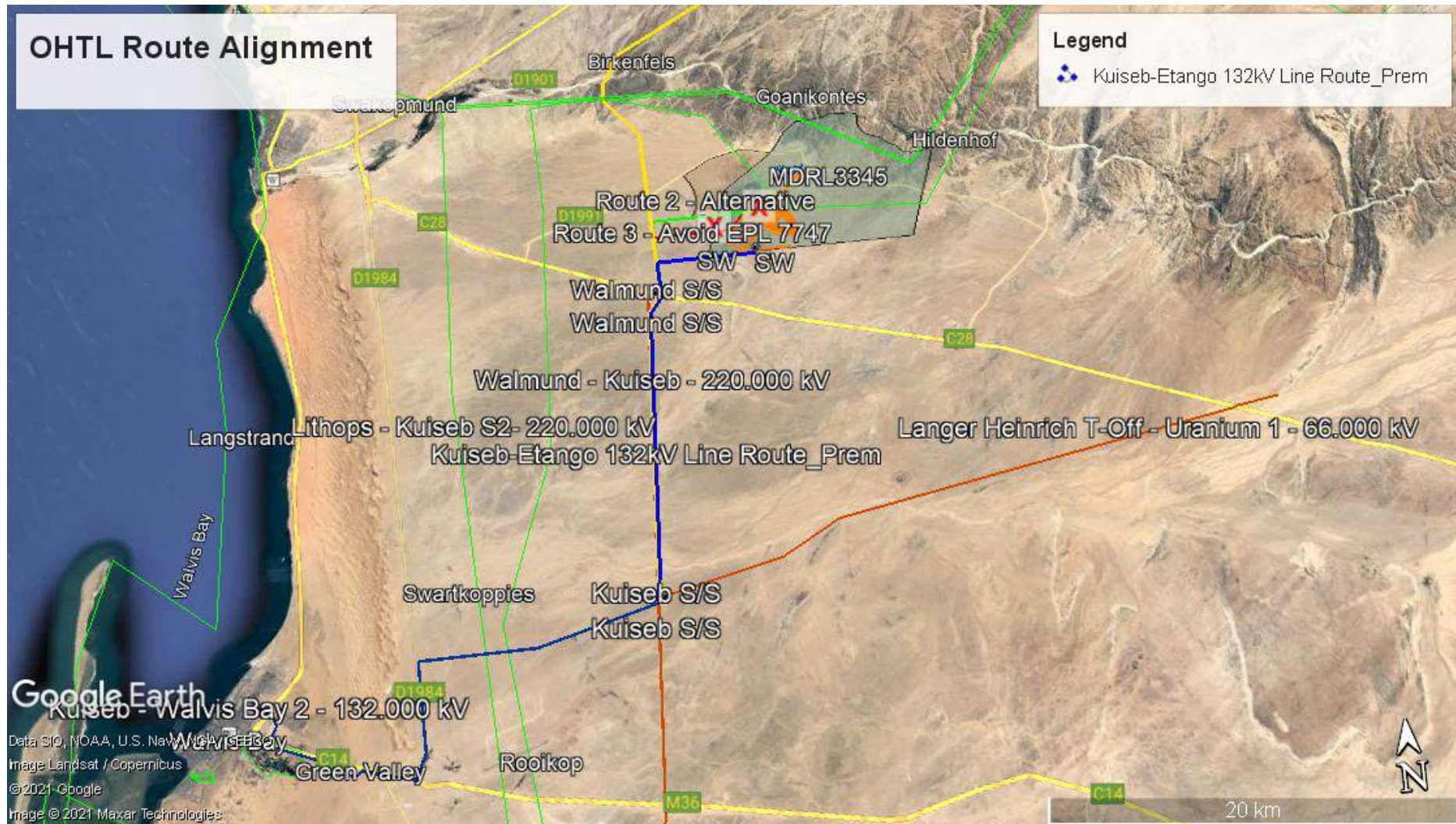


Figure 4.6 – 132 kV OHTL Route Alignment Options

4.10 PROJECT BENEFITS

4.10.1 SOCIO-ECONOMIC

4.10.1.1 Employment

The total project cost for the construction of the proposed 132 kV OHTL is estimated at around N\$112,5 Million. (*Addiza Power Consultants, 2021*) The construction of the OHTL will have direct employment opportunity for local people (i.e. unskilled & semi-skilled). It is envisaged that 10 – 20 people will be employed for 12 month period for the OHTL construction and the same amount of workers for the 18 month construction period for the Etango-8 substation and metering station. (*Pers. comm. Riaan van Zyl, Transmission Consulting Services*) The project will thus have an impact on creating employment, contributing to alleviating poverty and socio-economic upliftment within the Erongo Region, which is in line with Vision 2030.

4.10.1.2 Community Development

In the Bannerman Etango-8 Uranium Project financial model indicate N\$ 1.5 million per year are allocated towards community projects. The main focus being primarily towards tourism and education. As the mine will be situated in a National Park it is believed that the relationship with the tourism industry is very important so as to understand the needs of the tourism industry. (*pers. comm. Werner Ewald, Bannerman Resources (Pty) Ltd, 2021*)

4.10.1.3 Economic Spin-offs & Opportunities

The construction phase is expected to create opportunities to contractors and/or entrepreneurs within Walvis Bay and Swakopmund as well as Erongo Region.

4.10.1.4 Security in Supply of Electricity to Etango-8 Uranium Mine as an employer

The construction of the 132 kV OHTL will ensure the establishment and operation of the Etango-8 Uranium Mine over the following 14-17 years. It is envisaged that during construction of the mine, there will be approximately 1,000 people involved, while during operation about 800 people will be employed (employees and long-term contractors). Taxes to be paid to the Namibian Government over the initial Life of Mine (15 years) at the assumed selling price of US\$65/lb of U₃O₈ will include Export Levy, Royalty and Company Tax. (*pers. comm. Werner Ewald, Bannerman Resources (Pty) Ltd, 2021*) This will have a direct socio-economic benefit to the residents of Swakopmund and Walvis Bay, the Erongo Region and Namibia at large.

5 THE AFFECTED ENVIRONMENT

This chapter describes the details pertaining to the larger study area's existing biophysical and socio-economic environments, which defines the sensitivities to be considered during the planning, construction and operation of the Project.

This chapter provides base line information according to which the likely negative and positive impacts of the proposed 132 kV OHTL, Etango-8 substation and metering station will be assessed, as well as the significance thereof (as presented in section 7.4), which in turn will inform the applicable mitigating measures and need for any further detailed assessments.

A great deal of this chapter is derived from site visits, an ecological assessment and specialist input on Archaeology and Avifauna (attached as Appendixes D and E).

5.1 PHYSICAL ENVIRONMENT

The Namib Desert is a relatively narrow tract of dry land extending from south to north from the Olifants River in South Africa to San Nicolau in southern Angola. From west to east it is located between the South Atlantic Ocean and the Great Western Escarpment, most of it less than 200 km wide in width. (Seely, 2004)

The proposed Project Site falls within the *Central Namib* generally defined as an area between the Kuiseb River in the south and the Huab River in the north. The eastern inland boundary of the desert is not clearly defined, as the presence of mountains and large watercourses influences the availability of water and hence desert or non-desert life in a particular area. The eastern boundary is roughly located at one thousand meters above sea level, which approximates the 100 mm rainfall line, with rainfall decreasing towards the west and increasing towards the east. The physical environment of the Project Site is typical of the *Central Namib* coast, characterised by extreme aridity, which directly determines this particular bio-physical environment. It is in an accessible part of the Namib Desert where roads run across the Namib plain over a relatively level surface extending from the coast to the escarpment.

The 50 m servitude for the proposed 132 kV OHTL crosses extensive sandy gravel plains in the southern parts from the Kuiseb Substation to the Walmund Substation (16,7 km), with several drainage line systems. Further north, from the Walmund Substation to the point where the OHTL turns east (3,4 km), the route crosses gravel plains that are more undulating, also with drainage lines, but deeper than in the south, with rocky outcrops to the north-east. The final section (4,9 km) in the vicinity of the Etango-8 Substation is a more deeply incised, rocky landscape with deep washes.

The proposed Project will by its nature impact on the project site's peculiar physical character and vice-versa, which again will affect the bio-physical environment.

5.1.1 CLIMATE

5.1.1.1 Rainfall

The rainfall in the Namib Desert is minimal, varying from an average of less than 15 mm on the coast to 100 mm/annum on the eastern border. It is also irregular, with rainfall recorded in 1934 and 1976 exceeding the average by several hundred per cent, while in other years no rainfall at all was recorded. (*Armstrong, 1990*)

5.1.1.2 Fog

The Namib has an extremely important alternative source of moisture in the form of fog. Fog is a prevalent characteristic, extending inland over 100 days per year. It is caused by cool, moist air that blow in from the cold Atlantic Ocean and forms a fog belt that stretches up to 50 km inland over the warmer desert area. Here it condensates on any small outcrop or obstacle on the landscape and droplets are deposited on rocks, plants and soil surfaces. Fog is densest at an elevation of 300 to 600 m above sea level in the central part of the Namib Desert between the Kuiseb and Swakop Rivers. (*Armstrong, 1990*)

Coupled with the occurrence of fog is the presence of high humidity along the coast. Moving inland from the coast the average humidity drops, while the temperature increases. As a result, a foggy cool zone, is replaced further inland by an area where fog and high humidity frequently occur in the morning, but disappear during the course of the day. This part of the desert, between 30 and 60 km inland, experiences great daily fluctuations of temperature and humidity and is the most extreme climatic zone of the central Namib.

Endemic desert vegetation is dependent on this fog for survival, since it produces five times more moisture than rain in the central Namib and is much more predictable. (*Barnard, 1998*)

5.1.1.3 Temperature

The Central Namib is typified by mild summers and cool winters with average minimum and maximum temperatures ranging between 10°C and 24°C. (*Mendelson, 2012*)

5.1.1.4 Wind

Wind is an important component of the central Namib climate. Wind blows fog onshore and also transports bits of dead material which are an important food source for many fauna species.

The dominant wind direction is south-westerly, which maintain a cool inversion layer lying below the warmer desert air layer. This inversion layer reduces the turbulence necessary for cloud development and thus prevents rain. It is particularly the south-westerly winds that play an important role in the movement of sediments in a northerly to easterly direction. Persistent southerly to south-westerly winds, and occasional east winds, create the physical environment by keeping sand streams moving. They also introduce, distribute and cache (by burying) food resources in the form of windblown detritus. (*Armstrong, 1990*)

In winter the east (or berg) wind is dominant and blows hot sandy air from the desert to the coast.

5.1.2 GEOLOGY

The geology of the western parts of Namibia consists of a great variety of rock formations, most of them exposed in a rugged landscape of valleys, escarpments, mountains and large open plains. Most of these rocks were formed long ago by movement of the earth's crust and are still visible, because it is not covered with sand or other sediments that were deposited more recently. The geology is therefore more exposed and this is where most mineral deposits have been found. (Mendelson, 2012)

The geology of the Etanago-8 Uranium Project Site was studied in great detail during exploration work since 1970. According to Spicer 2012 *"the project area is underlain by the Abbabis metamorphic complex and the Swakop and Nosib Groups (Damara Sequence), which are made up by rocks of the Etusis, Khan, Rossing, Chuos, Karibib and Kuiseb formations. These rocks were exposed to extensive folding, faulting and erosion before the deposition of sedimentary deposits of the Namib Group, followed by another period of erosion. Predominately mixtite and pebbly quartzite of the Chuos Formation overlying amphibolite of the Khan Formation occur, which was intruded by Ordovician uranium-bearing alaskite. The rocks are partly covered by Tertiary and Quaternary Namib Group deposits. The Paleo-channels intersected in the southern part of the project area comprise calcretized alluvial sediments of Miocene age."* (Spicer, 2012)

5.1.3 TOPOGRAPHY

In the *Central Namib*, the land rises steadily from sea level to about 1,000 m across the breadth of the Namib Desert. The land surface is mostly flat to undulating gravel plains, punctuated with occasional outcrops, isolated 'inselberg' hills and mountains.

The typical Namib Dunes lie in a linear southern dune field to the south and south-west of the project area stretching from Swakopmund to Luderitz. A major topographical feature in the greater area is the deeply incised, ephemeral Swakop River and its tributaries, running from the east to reach the Atlantic Ocean in the west. The Swakop River is approximately 10 km to the north of the Etanago-8 Substation. Its main tributary, the Khan River flows from the north-east to join the Swakop River about 20 km east of Walmund Substation.

Rising out of the plain there are a number of isolated inselbergs, which remained above the surface of the plain as the softer surrounding material was eroded away. Inselbergs that surround the project area include Rössing Mountain, Swartbank Mountain, the Langer Heinrich, Tumasberg and Vogelfederberg.

The Project area itself is characterised by undulating gravel plains, singular rocky outcrops and drainage lines. The altitude ranges from 145 m at Kuiseb Substation to 200 m at Walmund Substation and 280 m at the Etanago-8 Substation, reaching around 330 m eastward on the mine site. (Scott&Scott, 2021)

5.1.3.1 Gravel Plains

The gravel plains along which the OHPL will transect is a level area with stone cover and underlying gypsum. The soil surface comprises of a biological soil crust. Biological soil crust can

be the dominant vegetation in these areas that are unsuitable for higher plants and are vital to soil stabilisation and primary production. It is home to vast lichen fields. Because of slow ecological processes under desert conditions, the biological soil crusts may take centuries to reform in case of disturbance. Only during periods of ample rain the gravel plains may harbour mostly grass - and small shrub species. Loss of the biological soil crusts result in reduced environmental productivity, while physical habitat is also made unsuitable for other life forms. It is thus environmentally sensitive and only has a moderate potential for restoration, since research on restoration of lichen fields are insufficient at this stage. (*Lalley, 2008*)



Photo 5.1.3.1. – Landscape along which OHTL will transect towards Etanago-8 Substation

5.1.3.2 Rocky Outcrops

The north-eastern section of the OHTL, where it turns east, north of Walmund towards Etanago-8 Substation transects some rocky outcrops. The inselbergs and rocky outcrops on and around the project area consist of granite, quartzite, marble or schist each has a different form and a different combination of living creature inhabiting its multitude of hidden crevices. Inselbergs surrounding the project site intercept the fog and the limited rainfall which flows off the bare expanses of rock to accumulate in cracks, crevices and short watercourses. They support a richer plant and animal life than surrounding gravel plains and are home to some protected fauna and flora. These will be difficult to restore in case of damage during construction, if not impossible. Habitat destruction can take place through building of the access road or anchoring pylons on ridge crests.



Photo 5.1.3.2 – Rocky outcrops that can provide shelter for desert fauna

5.1.4 HYDROLOGY

A number of dry riverbeds or drainage lines cross the *Central Namib* plain and flow westward towards the Swakopmund-Walvis Bay Dune Belt and Atlantic Ocean. The main river courses in the central Namib are (from south to north) the Kuiseb, Swakop, Khan, Omaruru, Ugab and Huab Rivers.

The ephemeral Swakop River is a major river system some 10 km north of where the proposed 132 kV OHTL terminates at the Etanago-8 Substation. Its main tributary, the Khan River flows from the north-east to join the Swakop River about 20 km east of Walmund Substation. The river is largely dry, but there are a few perennial pools that attract fauna and avifauna species. Between the Kuiseb and Walmund Substation, the OHTL traverse the Tsuma Drainage line and another few poorly defined drainage lines.

5.1.4.1 Drainage Lines

An east-west striking watershed separates the Swakop River and the Tumas Catchment areas. Most of the Project site lies within the Tumas catchment, where shallow drainage lines drain the terrain in a south-westerly direction towards the Swakopmund-Walvis Bay Dune Belt. These drainage lines are poorly defined and are only conspicuous by the perennial plants they support. They have a subterranean supply of water which supports this permanent growth of smaller shrubs. The drainage lines are sandy and subject to regular natural disturbance. Although the drainage lines are relatively easy to restore, the plants in the drainage lines grow slowly under desert conditions, and any that are destroyed through the construction of the OHPL will not be replaced quickly, if at all. Loss of plants reduces habitat availability and food sources for animals, either directly or through the effect on prey species.



Photo 5.1.4 – Typical drainage line that the OHTL will transect

Sporadic surface water flows play a major role in structuring and driving this desert ecosystem. Any disruption of surface-water flow patterns during construction therefore has the potential to negatively impact on downstream communities of plants and animals.

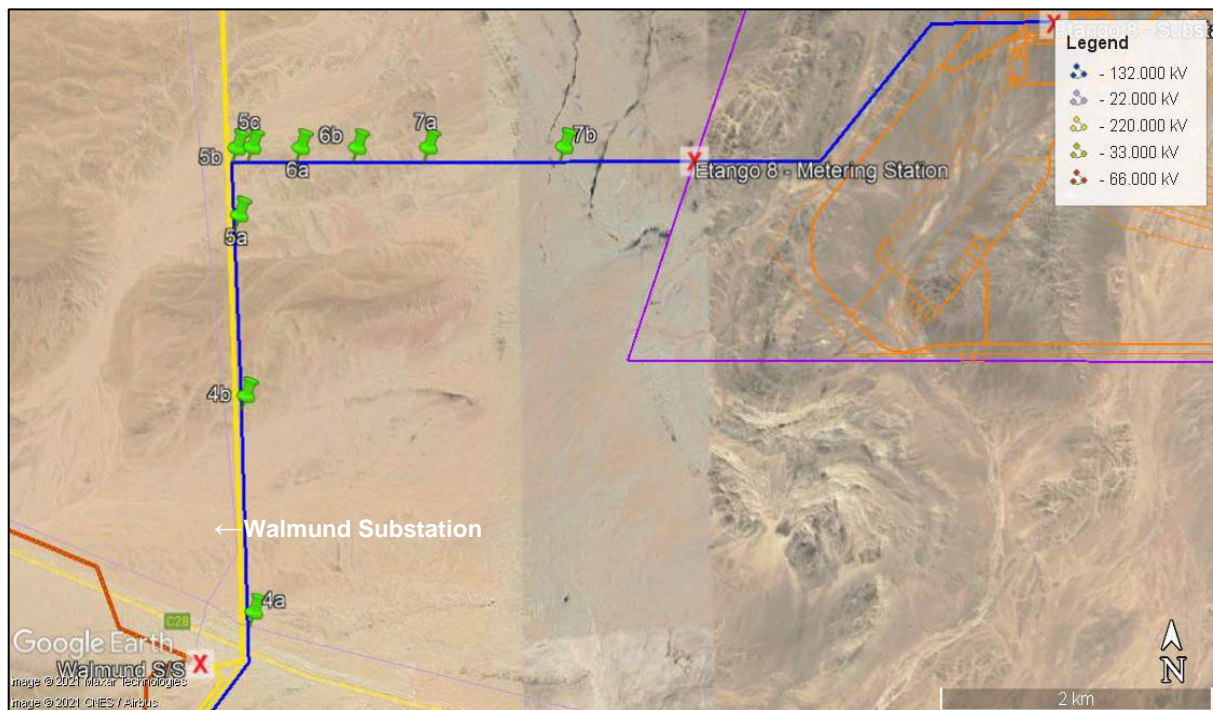


Figure 5.1 - Drainage lines (green markers) from Walmund to Etango-8 Substations on the proposed 132 kV OHTL route (Source: African Conservation Services cc, 2021).

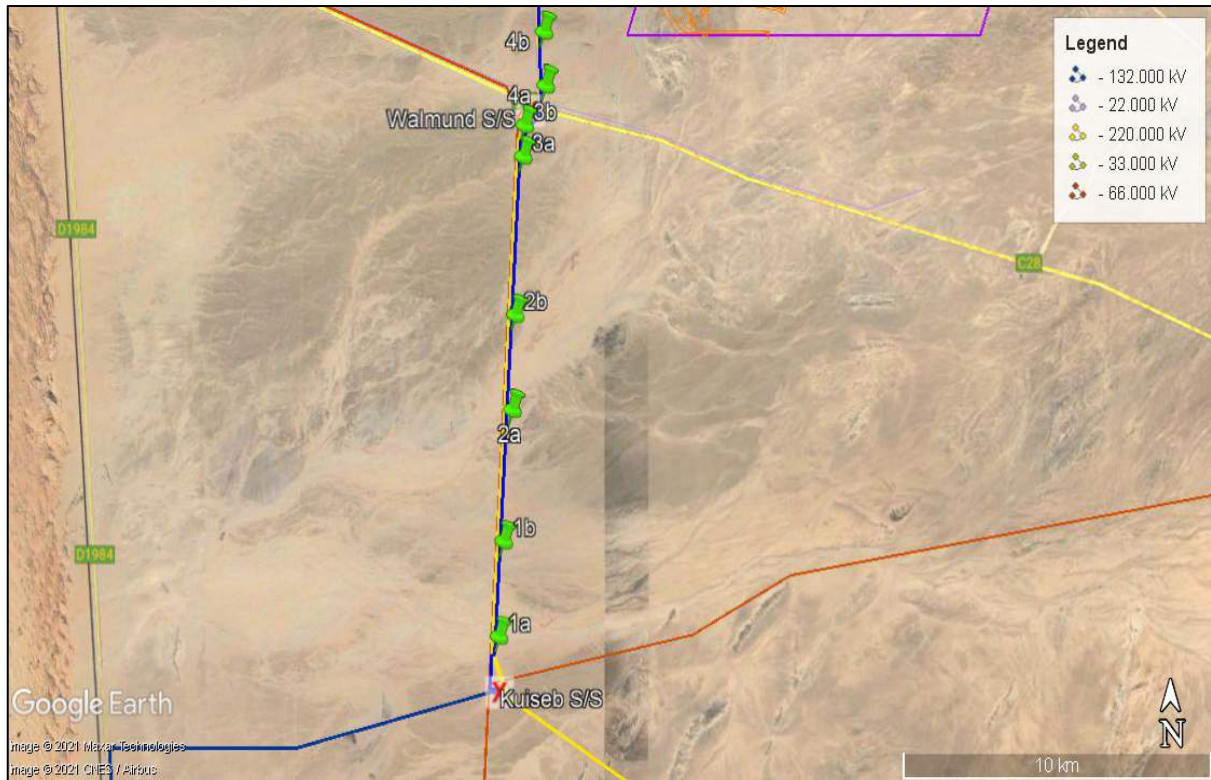


Figure 5.2 - Drainage lines (green markers) from Kuseb to Walmund Substations on the proposed 132 kV OHTL route (Source: African Conservation Services cc, 2021).

5.1.5 GROUNDWATER

As from 2007, Bannerman has drilled a large number of exploration boreholes in the project area and groundwater monitoring of water levels is undertaken monthly by Bannerman staff. Groundwater quality monitoring is also undertaken quarterly by BIWAC. Water samples are taken and analysed for the main ions and metals on a quarterly basis. Water is analysed for radionuclides on a bi-annual basis for the river boreholes, and on an annual basis for all other boreholes. Quarterly groundwater monitoring reports are provided to Bannerman by BIWAC.



Photo 5.1.5 – Bannerman Water Sampling Borehole

The water level contours obtained from these monitoring boreholes indicate a maximum groundwater elevation difference of 33 m (from north to south) across the Etanago-8 Uranium Mine Project area. The depth to groundwater appears to correlate with the topography of the area, generally increasing from east to west by up to approximately 37 m.

Generally, the regional groundwater flow is in a south-westerly direction, following the surface drainage towards the Atlantic Ocean. However, the steep gradient of groundwater contours on the Khan/Chuos contact could indicate the presence of a low permeability zone separating groundwater occurrence in two separate geological formations. Locally the groundwater flow is directed in a south-westerly direction towards the Swakopmund-Walvis Bay Dune Belt and northwards toward the Swakop River. The basement aquifer is characterized by very high groundwater salinities and high natural uranium and radionuclide concentrations. Groundwater in the Project area is thus not suitable for human consumption. (*Speiser, 2012*)

5.1.6 SOIL

The formation of true soils with well-defined profiles is absent because of the low moisture status of the region. The soils are made of raw minerals and are sandy and sometimes calcareous or with calcareous crusts, composed of particles in a wide range of sizes. Salt crusts are common on the soil close to the ocean, and the soils are brackish as far as the inland limit of coastal fog. Characteristic soils of the ecoregion include Arenosols and weakly developed shallow Halomorph soils (*Barnard 1998*). Gypsum accumulations are also characteristic of the ecoregion. (*Pallett 1995*).

5.1.7 ARCHAEOLOGY & HERITAGE

The central Namib Desert contains an exceptionally well preserved archaeological record of intermittent human occupation over the last one million years. Intensive mineral exploration has resulted in the construction of several new uranium mines. These studies were accompanied by a programme of detailed field survey to locate and identify archaeological sites that can be preserved or studied prior to their possible destruction. Over 320 such archaeological studies have been carried out in the last 20 years and the main results of these investigations have been published in an effort to improve public awareness of the archaeological record. Previous surveys have found a relatively low density of archaeological sites in the vicinity of the proposed powerline. Of these sites, only one is likely to be damaged by the proposed construction. Significance ranking 2 indicates an “isolated minor find in undisturbed primary context, with diagnostic material”, while Vulnerability ranking 3 indicates a “probable threat from inadvertent disturbance due to proximity of development”. (Please refer to the Archaeology Specialist Report in Appendix E)

5.1.8 IMPORTANT BIRD AREAS

Several Important Bird Areas (IBAs) are located in the larger area, mostly to the west. The coast lies about 20 km to the west of the study site. In these habitats, ecological features that are important to birds include saltpans (and a salt works) at Mile 4 north of Swakopmund; a lagoon at the Swakop River mouth; a 30 km rocky beach backed by a dune belt; artificial bird guano platforms; the extensive Walvis Bay Lagoon and associated wetlands (a coastal RAMSAR Site) and including the Namib-Naukluft National Park. (Please refer to Figure 5.3)

The presence of these areas so close to the proposed Project area increases the risk of collisions, while the lack of large trees for nesting increases the likelihood of birds nesting on power line structures. (Scott&Scott, 2021)

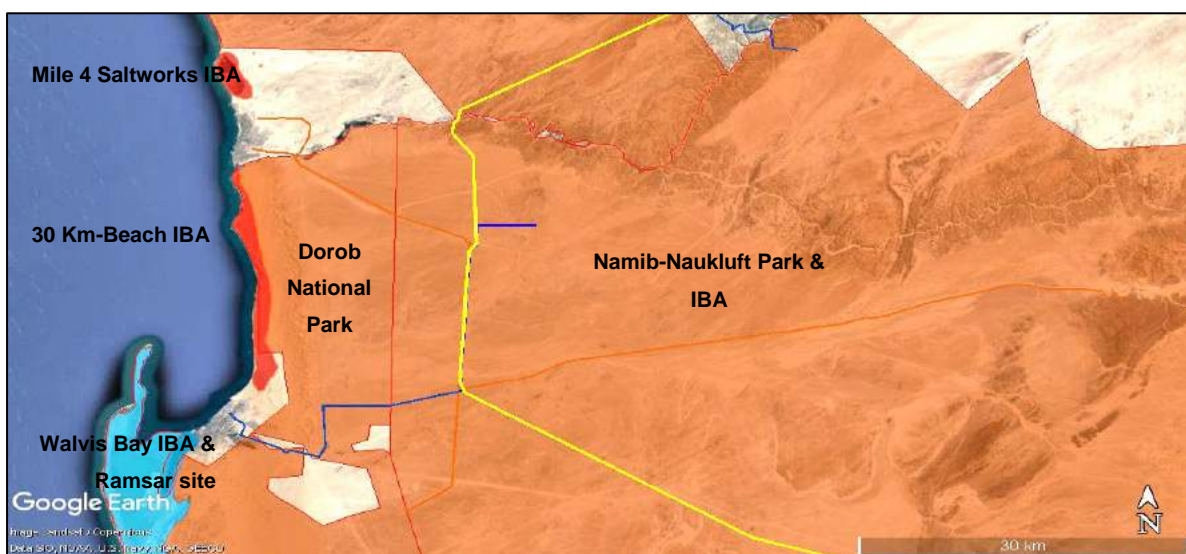


Figure 5.3 - Protected areas and Important Bird Areas [IBAs] in the vicinity of the study area.

(Source: African Conservation Services cc, 2021)

5.2 BIO-PHYSICAL ENVIRONMENT

The *Central Namib* forms part of southern Africa's *Desert Biome*. The lack of rain has led to adaptations by plants and animals, which facilitate use of fog as an alternative water source. Due to the low rainfall, there is also limited amount of vegetation and as a consequence many animals use detritus, which is composed of wind-blown dried bits of vegetation as a food source. Thus the extensive use of fog and detritus largely characterises the biology of the Namib and therefore the high endemism in these specifically adapted desert species. (Seely 2004) The level of endemism is exceptionally high among flora, insect - and reptile species. (Burke, 2006)

The present conservation status of the Namib Desert is good as most of the ecoregion is intact and is protected in extensive conservation areas. The Namib-Naukluft National Park (49,768 km²) is the largest conservation area in southern Africa and protects the central area of this ecoregion. The park runs from Swakopmund in the north to Lüderitz in the south. The southern part of the park is taken up by the large expanse known as Diamond Area No. 2, now the Sperrgebiet, to which public entry is strictly prohibited. The Namib Naukluft Park covers gravel plains, the Namib sand sea, the eastern semi-desert and the Kuiseb River and is therefore a good representation of the Central and Southern Namib vegetation types (du Plessis 1992). The well-known Sossusvlei is also located within this park.

To the west of the Namib Naukluft Park bordered to the north by the Ugab River and the Skeleton Coast Park lies the Dorob National Park. The Omaruru River bisects it, while the Swakop River is situated just south of its boundary. The towns of Henties Bay and Swakopmund are found within its boundaries, along with the hamlet of Wlotzkasbaken. The Cape Cross Seal Reserve is a separate reserve in the northern section of the area.

To the north of the Namib-Naukluft National Park lies the National West Coast Tourist Recreation Area. This area extends for 180 km up the coast and is under less stringent protection than the national parks. The Cape Cross Seal Reserve is located within this area and protects one of the largest colonies of Cape fur seals (*Arctocephalus pusillus*) in southern Africa. (Stuart and Stuart 1992)

5.2.1 FLORA

The *Central Namib* support sparse vegetation that is often inconspicuous, but they are not devoid of life. Just over 400 flora species occur in the Central Namib, making up nearly 10% of the flora of the country. Because of the extraordinary climatic conditions, many endemic flora species are restricted to the foggy coastal area and have a localised range. (Burke, 2006) In the context of this project it is important to note that the areas of highest plant endemism in the Namib are the Kaokoveld and the southern Namib, both regarded as major centres of endemism in Namibia (Maggs et al., 1998).

Vegetation cover in the Project Site is highly dependent on the little moisture available for their survival and drainage patterns greatly determine their distribution. Vegetation is limited to lichen fields on the gravel plains and sparse shrubs along the drainage lines. Grasses grow only after sufficient rain occurred and no trees are present here.

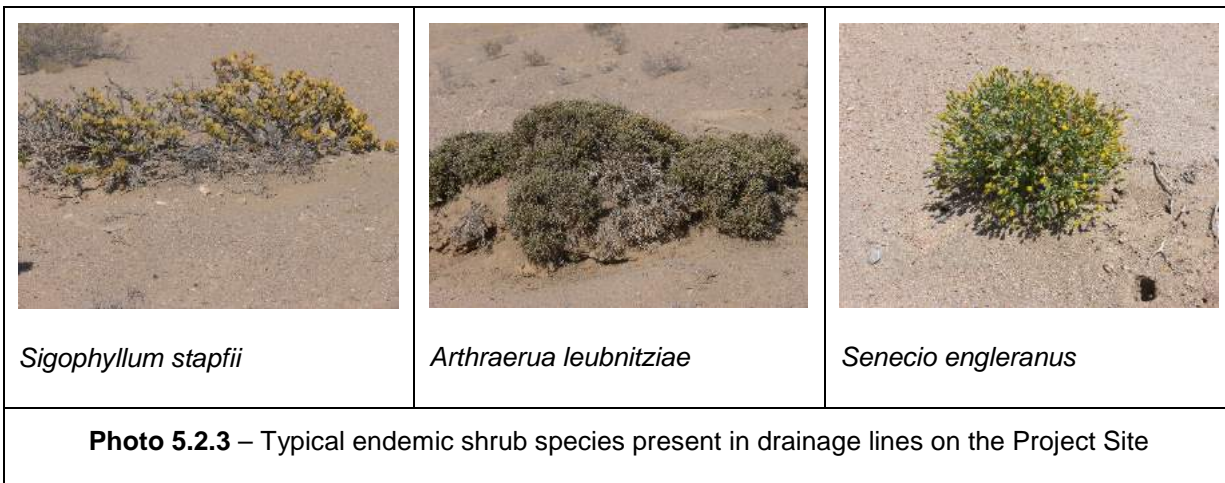
5.2.1.1 Shrubs, Succulents, Herbs and Bulbs

Shrubs, succulents, herbs and bulbs are mostly limited to the drainage lines that cross the Project Site. (Refer to Fig. 5.1.4 and 5.1.5 and Photo 5.1.4) It is mostly *Zygophyllum stapfii* (dollar-bush) (Photo 5.2.3a) and *Arthroerua leubnitziae* (pencil bush) (Photo 5.2.3b), that can be encountered, both endemic species as well as the near-endemic *Adenolobus pechuelii* and *Hermbstaedtia spathulifolia*, another Namibian endemic. These would be the species most affected by damage during construction. According to the Vegetation Study, 88 species may occur on the Project Site over which the OHTL will traverse. Of these 23 are Endemic (26%), 9 Protected (10%) under the Forestry Act No. 12 of 2001 and 5 are listed under CITES Appendix 2 (6%). Refer to Appendix D for the vegetation species list.

The proposed 132 kV OHTL transects two rocky outcrops where the OHTL turns east towards Etanago-8 Substation, but these smaller outcrops do not harbour any plants at the moment. However, when plants do occur during periods of abundant rainfall *Aloe asperifolia* and *Hoodia pedicellata* might be found on these rocky outcrops. (Pallet, 1995) Both are protected species, the former endemic and the latter near-endemic. As a rule *Aloe* and *Hoodia* tend to occur on larger ridges, particularly on marble and limestone/dolomite substrates.



Photo 5.2.2 – Drainage line over which the OHTL will traverse with small shrubs



5.2.1.2 Grasses

During the site visit in October 2021 no grass species were visible. After sufficient rains it can be expected that these plains may be covered in grasses, annuals and geophytes. Grass species expected in the Project Site after sufficient rain is listed in Appendix D. Grass species expected to be adversely affected by environmental damage during construction will be the species listed as Decreasers.

5.2.1.3 Lichens

The vast gravel plains that are largely devoid of vegetation, harbour fields of colourful lichens, known for their high diversity and are thought to harbour many undiscovered species (*Barnard, 1998*). An interesting feature of the *Central Namib* coastal areas, is the extensive formation of gypsum crusts in the soil as a result of sulphur releases during upwelling events in the ocean in the past. These substrates or biological crusts support the most diverse lichen fields in the world (*Burke 2004*). The *Central Namib* fog zone is the region of greatest lichen richness and abundance, characterised by its unusual endemism. Speciation and specialisation are also considered well advanced. (*Wessels 1989*) Some of the rarest and most interesting species of lichens in the world are found here, although many have still not been officially described (*Craven and Marais 1986*).

On the Project Site, lichens are more abundant to the north from Walmund Substation and north-east where the 132 kV OHTL runs through pristine land. Rocky ridges can also harbour a rich lichen population, particularly on the south-western slopes. It is thus necessary to conserve high-lying areas such as rocky outcrops.



Photo 5.2.4 – Lichens growing on rock surface

Because lichens absorb water and nutrients from the air, they are sensitive to pollutants and thus indicators that can be used to monitor air pollution. (*Burke, 2006*) Lichens in parts of the Namib Desert have been greatly damaged by off-road driving, which scars the landscape for many decades. However, many major lichen communities are protected within the Skeleton Coast Park, Namib Naukluft Park and Waterberg Plateau Park as well as in the restricted-access Sperrgebiet. (*Barnard, 1998*)

5.2.2 FAUNA

The scarcity of vegetation in the Namib has resulted in only the most resilient and hardy animals occurring within the area. Animal life in this harsh terrain is nourished by the sparse vegetation and the fact that fog precipitation provides fairly regular and adequate water for their survival, year-round. Animals living in the Namib have adapted to the varying habitats that are presented by the diverse landscape. It is estimated that at least 55 reptile, 5 amphibian and 21 mammal species are expected to occur in the Project site. (*Smithers, 2000*) A high proportion (60%) of the reptiles are endemics. (*Branch, 1998*)

The substrate on the gravel plains of the Project area are more consolidated and less sandy, making animal burrowing here more difficult.

The drainage lines are an important resource for plain-dwelling animals, which find shelter and a concentration of food and moisture in and around the plants. Seed-eating animals rely heavily on the products of shrubs in the washes. Invertebrates concentrate where there is shade, shelter from wind and food in the green plants or in detritus which collects around them. Scorpions,

lizards and other predators feed on the herbivores. Thus, animal life on the gravel plains is concentrated in the drainage lines and sustained by the plants in them. Even the shallow washes are functional miniature linear oases. (Seely, 2004)

On the low rocky outcrops and rock debris opportunities for animal inhabitants are limited by the sparse vegetation and shelter. Small rock overhangs, crevices underneath rocks and fissures and cracks on the surface provide shelter for small rock-living animals. Species dependent on rocky habitats, such as crevice-seeking lizards and scorpions, are found here in relatively low densities. These animals benefit from the shelter from heat, wind and predators, and the presence of moisture condensed from fog (some are known to drink this directly off wet surfaces). (Seely & Pallett, 2008) Refer to Appendix D for the fauna species lists.

5.2.2.1 Insecta and Archnida

The Namib Desert has a high species richness of beetles, particularly those belonging to the family *Tenebrionidae* (Lovegrove 1993) and also *Lepismatidae* and *Ctenolepisma* species (Irish 2011). More research and data collection is required on these insects to determine endemism and range-restriction. Rock-living scorpions such as *Uroplectes carinatus* and *Hadogenes tityrus* can be seen at night and organisms such as centipedes, insects and spiders are mostly confined to rocky substrates with a preference for granite, schists or dolerite and drainage lines. (Pallett, 2005) Many of these have evolved methods of condensing fog as a source of water. (Seely 2004).

5.2.2.2 Reptiles

The high species richness and endemism is made up largely of reptiles (60%). They have evolved adaptations to survive in this harsh environment when most birds and large mammals have not.

5.2.2.3 Amphibians

Amphibians are not expected in the Project Site under normal arid conditions. Aquatic larvae and thin permeable skin make them vulnerable to water loss and sunlight prevents amphibians from entirely living on land and limit their infiltration into arid habitats.

5.2.2.4 Mammals

The Central Namib is home to a large number of small rodent species that occur among the rocky habitats, in the vegetation of drainage lines and on the gravel plains (Hilton-Taylor 2000).

Like Avifauna species, bat species will be subject to possible powerline collision and electrocution. The bat species that are expected in and around the Project area are secure. (IUCN, 2021) The Project area does not have typical bat habitat with no caves, trees or possible shelter. It can thus be expected that bats will only traverse the area when moving from the rocky outcrops and inselbergs in the surrounding area.

Larger ungulates are scarce in the Central Namib, with only gemsbok (*Oryx gazella*) and springbok (*Antidorcas marsupialis*) present. They move nomadically from place to place, depending on where rain has fallen and where food is available. They are not as dependent on regular water as

some of the other ungulates such as mountain zebra, but if available they will frequent drinking places such as natural springs and artificially provided waterholes. All of the ungulates found in the Central Namib need to be able to move freely to and from these places without disturbance. (Griffin 1998).

The predators of the Namib Desert are cheetahs (*Acinonyx jubatus*), brown hyenas (*Hyaena brunnea*) and spotted hyenas (*Crocuta crocuta*), Cape foxes (*Vulpes chama*) and bat-eared foxes (*Otocyon megalotis*). Klipspringers (*Oreotragus oreotragus*), steenboks (*Raphicerus campestris*), baboons (*Papio ursinus*) and leopards (*Panthera pardus*) occur along the courses of the Kuiseb and Swakop Rivers (Lovegrove 1993).

Anthropogenic activities in the infrastructure corridor between Swakopmund and Walvis Bay prevent larger ungulates and predators to enter the Project Site freely.

5.2.2.5 Avifauna

Some 216 bird species have been recorded in the study area and surrounds, representing one third (32%) of the 676 species recorded in Namibia (this total excludes 27 exclusively marine species). Of these, 18 (8%) are on the Namibian Red Data list, and nine are also Globally Threatened. This diversity is regarded as relatively high for such an arid environment, and emphasises the importance of aquatic habitats in the greater area, including the coastal wetlands and the Swakop River system. (Refer to Figure 5.1.8) At least six other raptors that are power line-sensitive occur in the area. Four species are near-endemic to Namibia, while a number are endemic/near endemic to southern Africa.

The checklist of 216 species for the study area includes 18 species (8%) that are threatened in Namibia (Simmons et al. 2015; Appendix 1); of these, nine (50%) are also Globally Threatened (IUCN 2021). This represents 13% of the 71 species that are on the Namibian Red List. Large birds that collide with power lines, such as flamingos, bustards and raptors, have recently been identified as one of four major groups of threatened birds in Namibia (Simmons et al. 2015). For the study area, 11 of the above Red-listed species (including seven that are Globally Endangered) occur in sufficient numbers in the study area and surrounds to be considered likely to become involved in power line interactions.

According to the bird baseline and assessment of habitats and species, the study area is potentially sensitive for certain bird species, especially when viewed in the broader context of adjacent IBAs. Within the study area, the proposed transmission line servitude will intersect a number of extensive ephemeral drainage line/wash habitats that are highly sensitive in terms of the birdlife present. Refer to Appendix F for the Avifauna Baseline and Scoping Assessment.

5.3 LAND USE AND INFRASTRUCTURE

The most significant activities in the larger surrounding area of the proposed Project are conservation, nature-based tourism, mining, commerce and industrial development in the municipal areas and limited subsistence agriculture.



Photo 5.3 – Land use combination in the Project Area

The current land use of the area over which the proposed OHTL passes is state owned conservation area (i.e. Namib Naukluft National Park and Dorob National Park) (see Figure 5.1.8)

5.3.1 CONSERVATION AND PROTECTED AREAS

The proposed OHTL falls within the Namib Naukluft Park to its east and Dorob National Park to its west. MDRL 3345, and consequently the Etanago-8 Uranium Mine, also falls within this park. (Refer to Figure 5.1.8)

5.3.1.1 Namib Naukluft Park

The Namib Desert Park was proclaimed in 1907 as Game Reserve number 3 as a buffer zone to restrict English sovereignty to Walvis Bay. The Naukluft section was created to serve as a sanctuary for Hartmann zebra, which are endemic to Namibia. The amalgamation of these two parks with state land was proclaimed as the Namib-Naukluft Park in 1979. The most significant change in boundaries occurred in 1986 when the old Diamond Area number 2 and a portion of Diamond Area number 1 were incorporated into the park.

The area within the Namib-Naukluft Park includes the entire area south of the Swakop River, with the exception of the townlands around Walvis Bay and Swakopmund. Much research on the desert environment has been conducted in the Namib-Naukluft Park, due to the establishment of the Gobabeb Training and Research Centre on the banks of the Kuiseb River. (*Seely, 2004*)

The Project area is located in close proximity to some of the park's most important tourist attractions, namely the Moon Landscape (dramatic landscapes), Swakop River (dramatic landscape and linear oasis for plants and animals) and Welwitschia flats (home to one of the

largest populations of *Welwitschia* in the world). Mining has the potential to conflict with land uses such as conservation and eco-tourism, during the Life of Mine. (*Speiser, 2012*)

5.3.1.2 Dorob National Park

Dorob National Park was gazetted as a national park under the Nature Conservation Ordinance No.4 of 1975 in December 2010 and was previously referred to as the National West Coast Recreational Area. It is a protected area along the *Central Namib* coast and extends from the Kuiseb Delta south of Walvis Bay, north to the Ugab River and the Skeleton Coast Park, and west from the Atlantic Ocean to what was previously the National West Coast Tourist Recreation Area border. It is 1,600 kilometres in length and with the Namib-Naukluft Park it covers an area of 107,540 square kilometres. Some 75 species of birds flock to this coast, with nearly 1.6 million birds recorded on the coast.

The towns of Henties Bay and Swakopmund are found within its boundaries, along with the hamlet of Wlotzkasbaken. The Cape Cross Seal Reserve is a separate reserve in the northern section of the area. (*Ministry of Environment Forestry and Tourism, 2021*)

5.3.1.3 Important Bird Areas (IBA)

On the coast to the south, Walvis Bay was designated as a Ramsar site, or Wetland of International Importance, in 1995. The site covers 12,600 ha and conforms to five of the eight Ramsar criteria. IBAs are places of international significance for the conservation of birds at the Global, Regional (Continental) or Sub-regional (southern African) level, selected according to stringent criteria. Six IBAs fall within the vicinity of the study area, including five on the coast: Cape Cross Lagoon IBA (N010) in the north; Mile 4 Saltworks (N012); 30 Km-Beach: Walvis-Swakopmund (N013); Walvis Bay (N014) and Sandwich Harbour (N015) in the south. The Namib-Naukluft Park is also an IBA (N011). The above protected areas are important habitats for a large number of bird species and individuals. Movements of birds among such habitats, and inland, are made on a regular basis. (*Scott&Scott, 2021*)

5.3.2 MINING

In recent years, the discovery of uranium has resulted in the issuing of various exclusive prospecting licences in most of the western part of the Namib Naukluft Park north of the Kuiseb River, while a number of mining claims and uranium mines have been established within the park. A Strategic Environmental Assessment (SEA) was undertaken by the Namibian Government in response to the “uranium rush” that occurred when the market price started rising in 2005. An unprecedented wave of exclusive prospecting licence applications covered much of the western Erongo Region, until the Ministry of Mines and Energy (MME) announced a moratorium on the issuing of licences for nuclear fuel in 2007. The aim of the moratorium was to give the authorities and stakeholders time to consider the pros and cons of uranium mining and to develop a management plan. The “uranium rush” ground to a halt when the uranium price started dropping in 2011. A National Policy on Prospecting and Mining in Protected Areas was developed and suggest zonation with different management interventions and permissible use of protected areas. A number of companies however proceeded with exploration activities, feasibility studies, process

development and applications for mining licences. These EPLs and MDRLs received Environmental Clearance to operate in the Namib Naukluft Park under regulated conditions. Mines in the surrounding area include Rössing Uranium, Langer Heinrich and Husab Mine. The go-ahead for the Etango-8 Uranium Mine has been given by the Board of Directors and this will be the following uranium mine in the area, if uranium prices stay stable. (*Ministry of Mines and Energy, 2020*)

5.3.2.1 Exclusive Prospecting Licences (EPL)

The proposed 132 kV OHTL, along with the existing OHTLs, will traverse a few EPLs between Kuiseb Substation and Walmund Substation. (*Ministry of Mines and Energy, 2021*) These are:

- EPL 6820 granted to Reptile Uranium Namibia (Pty) Ltd from 03/08/2020 to 02/08/2023;
- EPL 3669 granted to Nova Energy Namibia (Pty) Ltd from 21/11/2006 to 30/03/2022; and a
- Reconnaissance License granted to Tumas Granite cc from 31/08/2017 to 16/10/2019.

The route alignment was adjusted to Route Option 3 to miss EPL 7747.

5.3.3 NATURE BASED TOURISM

Nature-based tourism, cultural heritage and historical sites play a key role in tourism activities along Namibia's west coast. A range of activities are provided by a number of tourism activity operators, contributing to job creation as well as the development of Swakopmund and Walvis Bay. Tourism in the Central Namib revolves around adventure tourism such as quad biking, business tourism, consumptive tourism such as fishing and eco-tourism.

Since Etango-8 Uranium Project is situated in the Namib Naukluft Park, Bannerman Mining Resources (Pty) Ltd believe that their relationship with the tourism industry is very important to understand the needs of and work together with this industry. They have already during the past 10 years worked closely with this industry and the park officials in this regard. (*Pers. comm. Werner Ewald, Managing Director of Bannerman Mining Resources (Pty) Ltd 2021*) The Managing Director of Bannerman Mining Resources (Pty) Ltd was awarded the Hospitality Association of Namibia's Tourism Personality of the Year in 2019.

5.3.4 COMMERCE AND INDUSTRIAL DEVELOPMENT

The closest populated area to the proposed Project site is that of Swakopmund, located about 25km to the north-west of Walmund Substation, while Walvis Bay is located about 36km to the south-west of Kuiseb Substation. The Erongo Region is connected by the national road network to the rest of the country via Okahandja, Windhoek, and Otjiwarongo and forms part of the Trans Kalahari Highway.

The upsurge in economic activities in Swakopmund since 2005 can be contributed to the "uranium rush" that followed the increase in uranium prices and demand for nuclear energy. This led to

additional accompanying economic activities. Town development took place in the form of tourism accommodation facilities, shopping malls and industrial services and commodities. (*Ministry of Mines and Energy, 2020*)

The fishing industry is a key economic activity of Walvis Bay's. Industrial infrastructure is provided by a railway connection that is also used by the mines to transport ore to Walvis Bay from where it is shipped for export. Consequently, an increase in mining activities has also contributed to the increase in container shipments through the Port of Walvis Bay. Thus, the transport networks within the Erongo Region play a key role in the facilitation of trade via Walvis Bay, supporting it as a hub for commercial trade. (*Ministry of Mines and Energy, 2020*)

5.3.5 AGRICULTURE

The Topnaar people still live along the Kuiseb River inside the Namib Naukluft Park and make a living of subsistent farming. Limited agricultural cultivation takes place along the Swakop River including Swakopmund Plots which makes use of the water for irrigation.

5.3.6 INFRASTRUCTURE

The coastal towns of Swakopmund and Walvis Bay accommodate typical municipal services associated with the supply of potable water (i.e. reservoirs; pump station; pipelines), electricity (powerlines) and sewage (pump stations; pipe lines; wastewater treatment plant).

A corridor of infrastructure exists in a north-south direction between Walvis Bay and Swakopmund. Infrastructure found within the area includes overhead power lines; water lines and pump stations, tarred and gravel roads and dirt tracks.

A large road network development, including a freeway between Swakopmund and Walvis Bay east of Dune 7 and a flyover system at the Swakop River C34/B2 road crossing, has recently been completed. The B2 main road linking Swakopmund to Windhoek has also been upgraded in recent years.

The Walvis Bay Airport is approximately 15 km to the east of Walvis Bay and the airport operates daily flights to Windhoek, Johannesburg and Cape Town. Walvis Bay Airport is primed to become a leader in cargo handling for marine, coastal and mining activities in the area.

Walvis Bay town council installed a containerised desalination plant in 2009 to augment its fresh water supply to residents. Additional units to enlarge this desalination unit could result in the system supplying half the town's water consumption needs. Another desalination plant was constructed by Areva north of Swakopmund to provide water to the Trekkopje Uranium mine. A contract was signed with NamWater for the distribution of this water to various other uranium mines in the region through a Pipeline system. (*World Nuclear News, 2013*)

5.4 VISUAL AESTHETICS AND SENSE OF PLACE

The Namib Naukluft Park constitutes a wide expanse of desert that has been informally managed as a wilderness area for many years. One of the last truly wild places that humans do not control and have not developed. The mere presence or activity of people does not disqualify an area from being pristine. Many people support the need for wilderness areas and thousands of tourists and locals are attracted to the Namib Naukluft Park each year to experience the sense of place that this vast landscape evokes, with its varied rugged geological features, colours and arid beauty.

The MDRL 3345 and its proposed 132 kV OHTL falls within the Namib Naukluft Park, which is an international tourist attraction that is frequented by visitors wishing to experience the breath-taking landscapes of the Moon landscape, Swakop River valley and Welwitschia plains. Apart from access roads, a couple of farms in the river valley and the MET camping sites, permanent development has been prohibited in this area. Now uranium mining, not only at Etanago-8 Uranium Project, but at other places in the vicinity of these popular visitor sites, is being proposed and the sense of place of this wild open area is potentially threatened.

A Strategic Environmental Assessment (SEA) in the Erongo Region was completed by the SAIEA, proposed by the Ministry of Mines and Energy and Namibian Chamber of Mines. It was undertaken for uranium mining and its additional infrastructure and to assess pressure on natural resources. It identified significant visual issues /potential threats and opportunities as well as the implications of cumulative mining development on the landscape and its effect on the Erongo Region tourism economy.

SEA identified red flag tourism areas in proximity to the proposed site: Unique areas of high importance for recreation that are not yet alienated by development and mining, was declared as 'red flag' areas for prospecting or mining development. These include the Moon Landscape which is approximately 6 km to the north of the Etanago-8 Substation.

The visual aesthetics and as a result the sense of place of the Project area is vast desert landscape. The Namib Naukluft Park's sense of place in the Project area has been altered by the infrastructure corridor that exists between Walvis Bay and Swakopmund. The railroad and highway on the west and various major OHTLs to the east thereof, give the impression of industrial development. The sense of place in this part of the NNP is not pristine desert anymore and it is recommended that infrastructure development be clustered together to avoid further encroachment to the east into the pristine desert environment. The proposed 132 kV OHTL lies within this infrastructure corridor.

The viewpoint at Goanikontes is in a northerly direction over the Moonlandscape. It is a breath-taking view over the canyon. If one is to look south from this viewpoint, the Etanago-8 Uranium Project and associated 132 kV OHTL will be visible from this site. The OHTL will follow existing powerlines for most of its length and these are vaguely visible in the distance from this viewpoint.



Photo 5.4.1 – View of the existing 220 kV OHTL from the D1991 leading to Goanikontes and the Moonlandscape

The only distance where the proposed 132 kV OHTL will traverse pristine desert environment will be the 4.9 km from the point where the line turns east to Etanago-8 Uranium Mine. The Visual Impact Assessment of the Etanago-8 Project Environmental and Social Impact Assessment addresses the visual impact of the mine including the OHTL associated with it. The mitigation measures are incorporated in the EMP for the proposed Etango-8 Uranium Project (*Speicer, 2012*).

5.5 SOCIO-ECONOMIC ENVIRONMENT

The Erongo region comprises seven constituencies, namely Karibib, Daures, Omaruru, Arandis, Brandberg, Walvis Bay Rural, Walvis Bay Urban and Swakopmund. The latter two constituencies have the highest population and are the main growth centres. The Erongo Region has a population of 150 400 people, resulting in a 39,7 % growth rate for the period 2001-2011. Unemployment is currently rated at 25 % (*National Statistics Agency, 2012*).

The economic activities of the Erongo Region revolve around its natural resources both renewable such as fish, as well as non-renewable resources which include minerals. This can be ascribed to the harsh climatic conditions that limit agricultural activities and make survival in the desert almost

impossible. Water is thus an important commodity. According to the 2001 Population and Housing Census, an estimated 80% of the Erongo Region population resided in the urban areas.

The economic activities of Walvis Bay rest on four pillars, namely fishing, tourism, manufacturing and the harbour. The commercial fishing industry is the cornerstone of Walvis Bay's economy and is the biggest employer. Apart from the fishing industry, many people are also employed at the harbour terminal and salt works.

The central coastal area from Walvis Bay to Henties Bay is a major holiday destination and centre for relaxation, with many accommodation establishments and camping sites. In the centre of this stretch is Swakopmund which can be regarded as the main centre for tourism. Swakopmund is the second most visited town with 50% and Walvis Bay with 32% of all tourists visiting these towns (*Ministry of Environment and Tourism, 2021*)

6 PUBLIC PARTICIPATION PROCESS

Public consultation and participation are an important aspect of an EA process. During public consultation, potential impacts that the proposed project may have on the natural and/or socio-economic environments, were identified. Consultation with Interested and Affected Parties (I&APs) and relevant Authorities enables transparent decision-making.

This chapter describes in detail the full extent of the public consultation process that was followed and the I&APs and authorities that were notified of the study being undertaken. It also includes the main issues and concerns raised during the public consultation process and comments received on the Background Information Document (BID) distributed during the first round of public consultation.

Public consultation for the purposes of this project was done as prescribed by Regulations 21 to 24 of the Environmental Impact Assessment Regulations (GN. 30 of 2012).

6.1 PUBLIC ENGAGEMENT

6.1.1 FIRST ROUND OF CONSULTATION

Engagement with the public and authorities as part of the first round of public consultation commenced on the 8th of October 2021 and concluded on the 29th of October 2021. During the first round of consultation, I&APs and authorities were given an opportunity to register and submit comments and/or concerns on the proposed project.

6.1.1.1 Activities of Public Engagement

Activities undertaken to date to ensure effective and adequate I&AP involvement, are as follows:

- A list of predetermined I&APs and authorities was compiled. A total of 55 I&APs were included on the database (Appendix G1).
- A notification email (Appendix G2) with Background Information Document (BID) (Appendix G3) was sent to all pre-identified I&APs and authorities (Appendix G1) on 08 October 2021.
- Notification letters (Appendix G4) were hand delivered on 08 October 2021 (Appendix G5) to all applicable Line Ministries & State-owned Enterprises situated in Windhoek (Appendix G1).
- Notification letters (Appendix G6) were couriered (Appendix G7) on the 06th of October 2021 to all applicable Line Ministries and State-Owned Enterprises situated within the Erongo Region.
- Notification letters (Appendix G8) were sent via registered post (Appendix G9) to the Mineral Rights License Holders (Appendix G1) on 08th of October 2021.

- Public notices announcing the commencement of the EA and an invitation to register as an I&AP were placed in the ‘Die Republikein’ and ‘The Namibian’ newspapers on 08 October 2021 and 15 October 2021 (Appendix G10).
- A notice board (with the dimensions 60cm x 42cm) was placed at the Erongo Regional Council; the Swakopmund Municipality; the Walvis Bay Municipality; the Arandis Constituency Office; and at the Walvis Bay Constituency Office (Appendix G11). On-site notices were placed at the Kuiseb and Walmund Substations (Appendix G11).

6.1.1.2 Comments Received and Responses Provided

All comments and feedback received from I&APs and Authorities are summarised in Table 6.1 below, while a copy of the original correspondence is attached as Appendix G12. A total of 3 I&AP were registered (Appendix G13).

Table 6.1: Comments received during the first round of public consultation

NO.	NAME	COMMENTS	NAME	RESPONSE
1.	Arandis Constituency - Concillor Hon. Benitha Imbamba (10/10/2021)	Noted with thanks.	Urban Green cc	
2.	NamWater (11/10/2021)	Dear Julia, Please register NamWater as an I&AP with the following contact details: NP du Plessis Plessisn@namwater.com.na +264 81 127 9040 Jolanda Kamburona Kamburonaj@namwater.com.na +264 81 144 1528 Please forward all relevant information to us. Regards Jolanda	Urban Green cc (13/10/2021)	Dear Jolanda, The above mentioned subject refers. Namwater has been registered as an I&AP and will be kept informed throughout the project. Kind regards Julia L. Bashir
	NamWater NP. Du Plessis (19/10/2021)	Dear Brand Please register NamWater as an I&AP with the following contact details:	Urban Green cc (19/10/2021)	Dear NP, Your email below refers. NamWater has been registered as an I&AP and will

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>NP du Plessis Plessisn@namwater.com.na +264 81 127 9040</p> <p>Jolanda Kamburona KamburonaJ@namwater.com.na +264 81 217 8116</p> <p>Fillemon Aupokolo AupokoloF@namwater.com.na +264 81 325 3301</p> <p>Please forward the BID to us.</p> <p>Regards</p> <p>NP</p>		<p>be kept informed throughout the scoping assessment process.</p> <p>Find attached the BID as requested.</p> <p>Should there be questions, please let us know?</p> <p>Regards</p> <p>Brand van Zyl</p>
	<p>NamWater CEO Mr Abraham Nehemia (29 October 2021)</p>	<p>Dear Mr Van Zyl</p> <p>RE: APPLICATION FOR AN ENVIRONMENTAL CLEARANCE FOR THE PROPOSED 132 KV OVERHEAD TRANSMISSION LINE FEEDING THE NEW 132/11KV BANNERMAN ETANAGO-8 MINE SUBSTATION, SWAKOPMUND</p> <p>1. With reference to the letter dated 08 October 2021, NamWater has no comments on the project at the moment.</p> <p>2. Thank you for the Background Information Document. Please register NamWater as an I&AP with the following contact details:</p> <p>NP du Plessis PlessisN@namwater.com.na 081 127 9040</p>	<p>Urban Green cc</p>	

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>Jolanda Kamburona KamburonaJ@namwater.com.na 081 144 1528</p> <p>Please forward all relevant documents to us.</p> <p>Yours Sincerely, Abraham Nehemia (MR) Chief Executive Officer</p>		
3.	Roads Authority Ms Elina Lumbu (12/10/2021)	<p>Good day Mr van Zyl</p> <p>Would you please send me the document on the subject matter, to enable us to submit our comments?</p> <p>Thanks Regards Elina Lumbu</p>	Urban Green cc	<p>Dear Ms. S. Kasera,</p> <p>Find attached the BID for the above mentioned project.</p> <p>Regards Brand van Zyl</p>
	Roads Authority CEO Mr Conrad Lutombi (20/10/2021)	<p>Dear Sir,</p> <p>APPLICATION FOR ENVIRONMENT CLEARANCE CERTIFICATE FOR THE PROPOSED 132kV OVERHEAD TRANSMISSION LINE FEEDING THE NEW 132/11/kV BANNERMAN ETANAGO-8 MINE SUBSTATION – SWAKOPMUND DISTRICT: OTJIWARONGO MAINTENANCE REGION</p> <p>Your letter dated 8 October on the subject matter</p>	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>has reference.</p> <p>Please be informed that the Roads Authority has no objection to the construction of a 132 kV overhead transmission line feeding the new 132/11kV, for Bannerman Etanago-8 Mine substation. However, permission to cross the Main Road (C26) with an overhead powerline should be obtained from the Roads Authority.</p> <p>Yours sincerely</p> <p>Conrad M. Lutombi</p> <p>Chief Executive Officer</p>		
4.	<p>Min of Defence and Veteran Affairs</p> <p>Executive Director</p> <p>Dr Wilhelmine Shivute</p> <p>(22/10/2021)</p>	<p>Mr Brand Van Zyl</p> <p>RE: APPLICATION FOR ENVIRONMENT CLEARANCE CERTIFICATE FOR THE PROPOSED 132kV OVERHEAD TRANSMISSION LINE FEEDING THE NEW 132/11/kV BANNERMAN ETANAGO-8 MINE SUBSTATION – SWAKOPMUND DISTRICT</p> <p>1. This letter bears reference to your letter dated 08 October 2021.</p> <p>2. The Ministry of Defence and Veteran Affairs is hereby informing your office that it has no objection for your application for an Environmental Clearance Certificate and wish to inform you that you may</p>	<p>Urban Green cc</p> <p>(13/10/2021)</p>	<p>Dear Ms Ndeilenga,</p> <p>The above mentioned subject refers.</p> <p>As per our phone discussion today, your office at the Rooikop military base was forwarded the Environmental Scoping Assessment introductory letter by the ED`s office, but unfortunately the map attached is in greyscale, making it difficult for you to relate to the legend.</p> <p>Based on the above, kindly find attached the locality map and the background information document (BID), providing information relevant to the proposed development, short overview of the receiving environment, and an invitation to submit</p>

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>proceed with your project.</p> <p>3. For more clarity on this matter, kindly contact our Directorate of Construction and Maintenance, at 061 204353/2354</p> <p>4. Thank you for your consideration in this regard.</p> <p>Dr Wilhelmine Shivute Executive Director</p>		<p>comments/questions/concerns.</p> <p>Kind regards Julia L. Bashir</p>
5.	<p>Reptile Mineral Resources and Exploration (PTY) Ltd. Ms Ingrid Scholz (18/10/2021)</p>	<p>Dear Brand,</p> <p>Today we received the registered letter from Urban Green cc regarding Bannerman’s ECC application.</p> <p>Would you be so kind and send me the background information document to distribute to my seniors?</p> <p>With kind regards Ingrid Ingrid Scholz Office Manager Tel +264 64 415 200 (switchboard) Fax +264 64 405 384 Email info@reptile.com.na PO Box 2538 Swakopmund, 22001, Namibia</p>	<p>Urban Green cc (18/10/2021)</p>	<p>Dear Ingrid,</p> <p>Your email with request below refers. Find attached the BID as requested. Please let me know should you have any questions.</p> <p>Regards Brand van Zyl</p>

NO.	NAME	COMMENTS	NAME	RESPONSE
		48 Hidipo Hamutenya Street, Swakopmund www.deeptyellow.com.au		
6.	CGP Swakop Uranium Carlene Baufeldt (Binneman) Superintendent: Environment (13/10/2021)	Good Day, I would like to register myself on behalf of Swakop Uranium as an IAP for the proposed project. Some comments from the BID are as follows: 1. The road next to Walmund sub-station is labelled incorrectly as the C26, it is in fact the C28. 2. Are you not taking into consideration to conduct an archaeological assessment as the area where the power line will be located could potentially have known sites or expected chance finds due to the abundant heritage in the area from the war times. 3. Additionally with your reference to habitat disturbance the known animal routes to water sources could also potentially be disturbed and will need to be assessed. 4. Regarding visual impact and sense of place, the influence on tourism should also be reviewed and potential offsets if required. 5. Waste management, hydrocarbon & effluent management is also not mentioned. Thank you & best regards,	Urban Green cc (13/10/2021)	Dear Carlene, Your email below refers. Swakop Uranium has been registered as an I&AP and will be kept informed throughout the project. Thank you for your input/comments, which will be included for consideration as part of the scoping study. Dr. John Kinahan is responsible for the heritage. Christelle Tromp will attend to the ecology. Your comments will be send to them as well for considering. Ann and Mike Scot will attend to the avifauna. Regards Brand van Zyl

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>Carlene Baufeldt (Binneman) Husab Mine Swakopmund Namibia PO Box 8667 Swakopmund Namibia Landline : +264 (0) 64 – 411 1237 E-mail : carlene.binneman@cgnpc.com.cn Website : www.swakopuranium.com</p>		
	<p>CGP Swakop Uranium Carlene Baufeldt (Binneman) Superintendent: Environment (13/10/2021)</p>	<p>Dear Brand, Thank you for the feedback received. Regards, Carlene</p>		
7.	<p>Namibia Civil Aviation Authority - Interim Executive Director of Civil Aviation Mr. Ericsson M. Nengola (12/10/2021)</p>	<p>SUBJECT APPLICATION FOR AN ENVIRONMENT CLEARANCE CERTIFICATE FOR THE PROPOSED 132 KV OVERHEAD TRANSMISSION LINE FEEDING THE NEW 132/11 KV BANNERMAN ETHANGO MINE SUBSTATION, SWAKOPMUND DISTRICT, ERONGO REGION</p> <p>I refer to the above captioned matter.</p> <p>1. Subparts 11 of the Namibia Civil Aviation Regulations (NAMCARs) of 2001, as amended in 2018 and the Namibia Civil Aviation Technical</p>	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>Standards – Aerodromes and Heliports (NAMCATS – AH), stipulates the requirements for Obstacle Restriction and Removal,</p> <p>2. The following are the requirements for the erection of obstacles in accordance with the Namibia Civil Aviation Regulations (NAMCARs) of 2001, as amended in 2018:</p> <p>Erection of obstacles</p> <p>(1) 139.11.2 A person may not cause or permit the erection or growth of an obstacles at, or in the vicinity of, an aerodrome, where the obstacle may prevent an aircraft operation from being conducted safely or the aerodrome from being usable.</p> <p>(2) The erection of buildings or other objects in the navigating airspace or in the vicinity of an aerodrome or navigation aid must be in accordance with standards prescribed in Document NAM – CATS-AH</p> <p>(3) A person may not cause or permits any object, including new or extension of existing objects to penetrate the obstacle limitation surfaces, established in accordance with regulation 139.11.3, without the written permission of the Executive Director.</p> <p>3. Subsequently, the above-stated regulations are further supplemented in the NAMCATS-AH, as</p>		

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>follows:</p> <p>139.11.2 Erection of obstacles</p> <p>(1) The erection or growth of an obstacle at or in the vicinity of an aerodrome, must not be permitted where the obstacle may prevent an aircraft operation from being conducted safely or the aerodrome from being usable.</p> <p>(2) Buildings or other objects which will constitute an obstruction or potential hazards to aircraft moving in the navigable airspace in the vicinity of an aerodrome, or navigation aid, or which will adversely affect the performance of the radio navigation or instrument landing systems, may not be erected or allowed to come into existence without prior written approval of the Executive Director and if erected in the absence of approval are liable to forced removal without right of compensation.</p> <p>(3) No buildings or object higher than 45 metres above the aerodrome elevation, or in the case of a water aerodrome, the normal level of water, may be erected within a distance of 15 kilometers measured from the aerodrome reference point without written approval of the Executive Director.</p> <p>(4) A person must cause or permits any object, to penetrate the obstacles limitation surface, without the written permission of the Executive Director, where the object may cause an increased in an</p>		

NO.	NAME	COMMENTS	NAME	RESPONSE
		<p>obstacle clearance altitude or in the height for an instrument approach procedure or of any associated visual circling procedures.</p> <p>(5) The object referred to in sub-regulation (4) includes a new object or an extension of an existing object above the limitation surface.</p> <p>(6) In the event of a conflict of interest between land use authorities and air space users, air safety must be regarded as predominant and not to be compromised by land development projects or other obstacles.</p> <p>4. Hence, an entity with the interests of erecting structure with the features mentioned in the requirements of the regulatory and technical standard, must seek approval from my from my office, prior to the erection of the structures.</p> <p>5. The interested parties must complete for evaluation the following application forms; FSS-AGA-FORM-032 (permanent structures) and /or FSS-AGA-FORM-033) (temporary structures), as may be required. Hereafter, the applications are then evaluated, and the response is provided to the applicant via my office.</p> <p>Thanking you in anticipation.</p> <p>Your sincerely,</p>		

NO.	NAME	COMMENTS	NAME	RESPONSE
		Mr. Ericsson M. Nengola Interim Executive Director of Civil Aviation		

6.1.2 SECOND ROUND OF CONSULTATION

Engagement with the public and authorities as part of the second round of public consultation commenced on the 2nd of December 2021 and concluded on the 9th of December 2021. During the second round of consultation, I&APs and authorities were given an opportunity to submit comments for consideration and inclusion.

6.1.2.1 Activities of Public Engagement

Activities undertaken to date to ensure effective and adequate I&AP involvement, are as follows:

- A notification email (Appendix G14) informing all affected authorities and registered I&APs of the availability of the Draft Scoping Report and request for comment was distributed on 2 December 2021. The proof of successful delivery of emails is attached as Appendix G15.

6.1.2.2 Comments Received and Responses Provided

All comments and feedback received from I&APs and Authorities are summarised in Table 6.1 below, while a copy of the original correspondence is attached as Appendix G16.

Table 6.2: Comments received during the second round of public consultation

NO.	NAME	COMMENTS	NAME	RESPONSE
1.	Arandis Constituency Councillor Hon. Benitha Imbamba (02/12/2021)	Thank you for the information. Hon. Benitha Imbamba Arandis Constituency Office	Urban Green cc	
2.	NamWater Senior Manager – Head of Program Management Hanjörg Drews (03/12/2021)	Hi Julia, Thanks for your e-mail below. Please be so kind and let us have an electronic copy of the ESA report or a link thereto. Many thanks in advance, Hanjörg Drews. NamWater	Urban Green cc (03/12/2021)	Dear Mr Hanjörg, Your email below refers. Find attached the electronic copy of the ESA Report (without appendices) for the Bannerman Resources 132kV Overhead Transmission Line, Erongo Region. Please confirm receipt of the ESA Report. Thank you. Kind regards Julia L. Bashir
	NamWater Senior Manager – Head of Program	Thank you so much, well received. Hanjörg Drews. NamWater	Urban Green cc	

NO.	NAME	COMMENTS	NAME	RESPONSE
	Management Hanjörg Drews (03/12/2021)			
	NamWater Jolanda Kamburona (03/12/2021)	Dear Julia, Please send us the electronic version of the scoping report. Regards, Jolanda	Urban Green cc (03/12/2021)	Dear Jolanda, Your email below refers. Find attached the electronic copy of the ESA Report (without appendices) for the Bannerman Resources 132kV Overhead Transmission Line, Erongo Region. Please confirm receipt of the ESA Report. Thank you. Kind regards Julia L. Bashir
	NamWater Jolanda Kamburona (03/12/2021)	Dear Julia, Received, thank you. Regards, Jolanda	Urban Green cc	
3.	NamPower	Dear Julia Bashir, I am unable to find the BID referred to also take note of	Urban Green cc	Dear Mr Viljoen,

NO.	NAME	COMMENTS	NAME	RESPONSE
	(03/12/2021)	<p>the ESA Report. Kindly submit both so as to circulate among the internal NamPower stakeholders.</p> <p>Thank you and kind regards,</p> <p>Chris Viljoen NamPower</p>	(03/12/2021)	<p>The above mentioned subject refers.</p> <p>The availability of the BID was communicated to the MD`s office via a hand delivered letter on 08 October 2021.</p> <p>Since it appears that you had missed it, kindly find attached the BID as requested, along with the locality map. Thank you.</p> <p>Kind regards</p> <p>Julia L. Bashir</p>
4.	<p>TransNamib Executive Corporate Services Mr Mberipura Hifitikeko (06/12/2021)</p>	<p>Dear Julia,</p> <p>Please share with us an electronic copy of the ESA Report.</p> <p>Thank you.</p> <p>Mberipura Hifitikeko Executive: Corporate Services Tel: +264 61 298 2198 Mobile: +264 811 285 849 Mberipura.Hifitikeko@transnamib.com.na www.transnamib.com.na</p>	<p>Urban Green cc (06/12/2021)</p>	<p>Dear Mr Hifitikeko,</p> <p>Your email below refers.</p> <p>Find attached the electronic copy of the ESA Report (without appendices) for the Bannerman Resources 132kV Overhead Transmission Line, Erongo Region.</p> <p>Please confirm receipt of the ESA Report. Thank you.</p> <p>Kind regards</p>

NO.	NAME	COMMENTS	NAME	RESPONSE
				Julia L. Bashir
	TransNamib Executive Corporate Services Mr Mberipura Hifitikeko (06/12/2021)	Thank you, we will revert back by the due date. Mberipura Hifitikeko Executive: Corporate Services Tel: +264 61 298 2198 Mobile: +264 811 285 849 Mberipura.Hifitikeko@transnamib.com.na www.transnamib.com.na	Urban Green cc	
5.	Mineral Rights Licence Holder Mosaic Crystal Investment cc Ms Cecilia Nekongo (08/12/2021)	Good morning, Julia Thank you for the email and notification therein. The email seems to have fallen through the cracks on side. Kindly share a copy of the ESA report with me so I may peruse and give comments if any. Pleasant regards, Cecilia	Urban Green cc (08/12/2021)	Dear Cecilia, Your email below refers. Find attached the electronic copy of the ESA Report (without appendices) for the Bannerman Resources 132kV Overhead Transmission Line, Erongo Region. Please confirm receipt of the ESA Report. Thank you. Kind regards Julia L. Bashir

7 ASSESSMENT OF ENVIRONMENTAL ISSUES, POTENTIAL IMPACTS AND MITIGATIONS

This chapter provides a description and assessment of the key issues of concern and potential impacts associated with the construction of the Overhead Transmission Line to Etanago-8 Uranium Mine (i.e. the Project). Mitigation measures relevant to the planning, design, construction, operational and decommissioning phases of the Project as appropriate are recommended. These measures are aimed at avoiding, minimising, or rehabilitating negative impacts or enhancing potential benefits. The significance of potential impacts without and with mitigation is also provided.

The Environmental Assessment Process consisted of two phases, the first being the screening phase and the second the scoping phase, as explained below.

7.1 SCREENING PHASE METHODOLOGY

Each of the potential impacts identified during public consultation and the scoping assessment was screened according to a set of questions (Figure 7.1), which resulted in those impacts not requiring further assessment (see section 7.1.1 below) and those impacts requiring further assessment (see section 7.4 and 7.5).

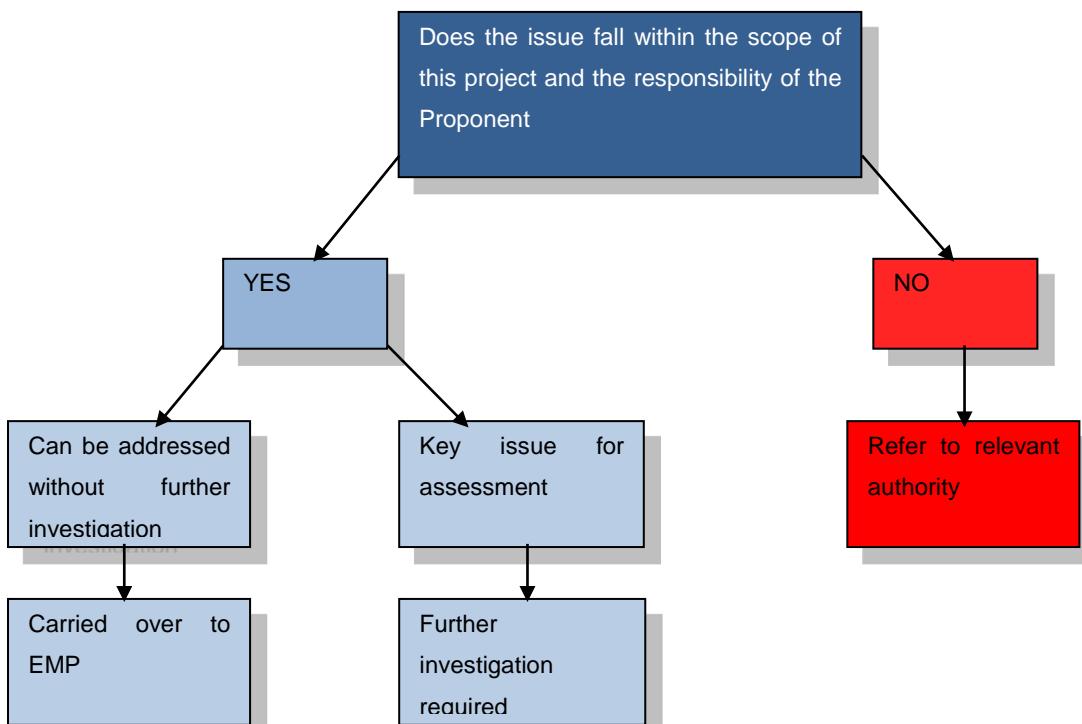


Figure 7.1: Screening process for determining key impacts

7.1.1 IMPACTS NOT REQUIRING FURTHER ASSESSMENT

The following impacts were identified as to not have any negative impact (i.e. positive impacts) or minor impacts not of any significance that require further assessment.

7.1.1.1 Socio-Economic Benefits

The proposed Project holds various direct and indirect socio-economic benefits for both the local people of Swakopmund, Walvis Bay, the Erongo Region and Namibia. (see section 4.10)

- The construction phase of the Project will ensure employment creation (mostly temporary and unskilled) for people residing near the proposed Project area.
- The economic activities triggered by the development of the Etanago-8 Uranium Mine and increased foreign revenue will have various local socio-economic spin-offs.
- The operational phase will ensure security in the supply of electricity to the Etanago-8 Uranium Project, which will increase productions with resulting increase in full time employment.

7.1.1.2 Loss of Archaeological sites

On the basis of the field survey data reported the proposed OHTL construction is not considered to pose a significant threat to the archaeology of the area concerned. Only one isolated minor find in undisturbed primary context was identified, with a probable threat from inadvertent disturbance due to proximity of development. (see Section 5.1.7) As a precaution it is recommended that the proponent should adopt the Chance Finds Procedure and this is addressed in the Environmental Management Plan. (See Appendix H)

7.1.1.3 Obstruction of OHTL to the Walvis Bay Airport

The Walvis Bay Airport is approximately 15 km south-west of Kuiseb Substation. Flights that currently operate from this airport are with Airlink to Windhoek, Johannesburg and Cape Town. The approach and departure angle of the first two is in an easterly direction and to the latter in a southern direction. The particular airport operates under Instrument Flight Rules (IFR) and communication facilities and radio navigation exists.

According to the Namibia Civil Aviation Regulations (NAMCARs) an object may not interfere with the safe operations of aircrafts to and from an aerodrome. No object higher than 45 m may be erected within 15 km from an aerodrome. It is not anticipated that the application for approval will be unsuccessful. The height of the proposed OHTL is designed to be 20,6 m, which is lower than the required height and the existing two 220 kV OHTLs that is already constructed within the same servitude.

7.1.1.4 Electric and Magnetic Fields (EMF)

Electric and magnetic fields are created with the generation and use of electricity and at the frequency of the electrical power system. Various studies have been conducted on the topic of

EMF and possible health effects over the last two decades. Although there is concern over the potential health effects associated with exposure to EMF, there is no empirical data demonstrating adverse health effects from exposure to power transmission lines and equipment. Also, apart from some minor local effects no significant effects of EMF on environmental species have been identified. Guidelines for EMF exposure are set by the International Commission for Non-Ionising Radiation Protection (ICNIRP 1998) and (ICNIRP 2010). According to these standards for EMF associated with power lines can be summarized as follows:

Table 7.1 – Electric and Magnetic Fields associated with powerlines

REFERENCE LEVEL:	ELECTRIC FIELD (kV/M)		MAGNETIC FIELD (μ T)	
	ICNIRP 1998	ICNIRP 2010	ICNIRP 1998	ICNIRP 2010
Occupational	10	10	500	1000
General Public	5	5	100	200

Typical magnetic field levels encountered directly below a 132kV power line at ground level is 7 μ T. 25m from centre line of a 132kV power line it would be 0.5 μ T. Based on the parameters for the proposed 132 kV lines it can be concluded that the highest magnetic field exposure can be expected at the conductors. From here it shows an exponential decrease with distance. At a distance of 25m from the source, the radiation levels are expected to be less than 0.5 μ T, which is 99.95% below the prescribed ICNIRP guidelines (2010). (Hubbard 2018) The servitude of 25 m for the 132 kV Powerline and the servitude of 31 m for the 220 kV OHTL are sufficient to reduce EMF to acceptable standards. No human settlement or activity exists close to the Project site.

7.2 SCOPING ASSESSMENT METHODOLOGY

The list of impacts that were subjected to a scoping assessment is presented in Table 7.3 and 7.4, as per the evaluation criteria presented in Table 7.2 below.

The key impacts, identified after carrying out screening (see Section 7.1 above), were evaluated in terms of extent (spatial scale), duration (time scale), intensity (magnitude) and probability. The means of arriving at the different significance ratings is explained in Table 7.2 below.

These criteria are used to ascertain the *significance* of the impact, firstly in the case of no mitigation and then with the most effective mitigation measure(s) in place. The significance of an impact is derived by considering the temporal and spatial scales and magnitude. Such significance is also informed by the context of the impact, i.e. the character and identity of the receptor of the impact.

Table 7.2: Criteria for impact evaluation

CRITERIA	CATEGORY
Impact	This is a description of the expected impact
Nature	<p>Positive – environment overall will benefit from the impact</p> <p>Negative – environment overall will be adversely affected by the impact</p> <p>Neutral – environment overall will not be affected</p>
Extent	<p>Site Specific: Expanding only as far as the activity itself (<i>onsite</i>)</p> <p>Local: Restricted to immediate environment within 5 km of the site</p> <p>Regional: Within the Karas region</p> <p>National: Within Namibia</p>
Duration	<p>Reviews the lifetime of the impact, as being -</p> <p>Very short – days, <3 days</p> <p>Short - days, <1 month)</p> <p>Medium - months, <1 year</p> <p>Long - years, 1 -10 years</p> <p>Permanent - >10 years</p>
Intensity	<p>Establishes whether the magnitude of the impact is destructive or innocuous and whether it exceeds set standards, and is described as –</p> <p>None (No environmental functions and processes are affected);</p> <p>Low (Environmental functions and processes are negligibly affected);</p> <p>Medium (Environment continues to function but in a noticeably modified manner);</p> <p>High (Environmental functions and processes are altered such that they temporarily or permanently cease and/or exceed legal standards/requirements).</p>
Probability	<p>Considers the likelihood of the impact occurring and is described as –</p> <p>Improbable (low likelihood),</p> <p>Probable (distinct possibility),</p>

CRITERIA	CATEGORY
	<p>Highly probable (most likely) or</p> <p>Definite (impact will occur regardless of prevention measures).</p>
<p>Significance (no mitigation)</p>	<p>None (A concern or potential impact that, upon evaluation, is found to have no significant impact at all)</p> <p>Low (Any magnitude, impacts will be localised and temporary. Accordingly, the impact is not expected to require amendment to the project design)</p> <p>Moderate (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a “no go” implication for the project unless mitigation or re-design is practically achievable)</p>
<p>Mitigation</p>	<p>Description of possible mitigation measures</p>
<p>Significance (with mitigation)</p>	<p>None (A concern or potential impact that, upon evaluation, is found to have no significant impact at all)</p> <p>Low (Any magnitude, impacts will be localised and temporary. Accordingly, the impact is not expected to require amendment to the project design)</p> <p>Moderate (Impacts of moderate magnitude locally to regionally in the short term. Accordingly, the impact is expected to require modification of the project design or alternative mitigation)</p> <p>High (Impacts of high magnitude locally and in the long term and/or regionally and beyond. Accordingly, the impact could have a “no go” implication for the project unless mitigation or re-design is practically achievable)</p>
<p>Confidence level</p>	<p>The degree of confidence in the predictions, based on the availability of information and specialist knowledge.</p> <p>Low (based on the availability of specialist knowledge and other information)</p> <p>Medium (based on the availability of specialist knowledge and other information)</p> <p>High (based on the availability of specialist knowledge and other information)</p>

The decision as to which combination of alternatives and mitigation measures to apply lies with the proponent, and their acceptance and approval ultimately with the relevant Competent Authority.

7.3 MITIGATION APPLICATION METHODOLOGY

There is a hierarchy of actions which can be undertaken to respond to any development or activity. These cover avoidance, minimisation and compensation. It is possible and considered sought after to enhance the environment by ensuring that positive gains are included in the development. If negative impacts occur then the hierarchy, as a guiding philosophy, recommends the following steps.

Impact avoidance: This step is most effective when applied at an early stage of project planning. It can be achieved by:

1. Not undertaking certain actions or elements that could result in adverse impacts;
2. Avoiding areas that are environmentally sensitive; and
3. Putting in place preventative measures to stop adverse impacts from occurring.

Impact minimisation: This step is usually taken during impact identification and prediction to limit or reduce the degree, extent, magnitude, or duration of adverse impacts. It can be achieved by:

4. Scaling down or relocating the proposal;
5. Redesigning elements of the project; and
6. Implementing mitigation measures to manage the impacts.

Impact compensation: This step is usually applied to remedy unavoidable residual adverse impacts. It can be achieved by:

7. Rehabilitation of the affected site or environment, for example, by habitat enhancement;
8. Restoration of the affected site or environment to its previous state or better; and
9. Replacement of the same resource values at another location (off-set), for example, by wetland engineering to provide an equivalent area to that lost to drainage or infill.

7.4 POTENTIAL IMPACTS IDENTIFIED AND ASSESSED

The information presented in this section has mainly been drawn from the information received from the Proponent and Engineers regarding the proposed Project, specialist studies and public engagement that was undertaken as part of this phase of the EA process.

For this assessment's purpose the issues and impacts identified are grouped according to the main development phases – i.e. construction phase, operational phase and decommissioning phase.

7.4.1 POSSIBLE IMPACTS DURING CONSTRUCTION PHASE

Table 7.3 presents the potential impacts that might occur during the construction phase of the Project, while Table 7.3.1 to Table 7.3.10 presents each potential impact and outcome in detail.

All impacts can be viewed as negative, unless otherwise mentioned. Positive impacts and impacts that was do not found significant for further investigation, have been listed in section 7.1.1, above.

Table 7.3 - Potential impacts to consider during the Construction Phase

IMPACT	CAUSE	
Loss of Biodiversity and Habitat Destruction:		
Flora	OHTL Construction	Tracks and roads on site
		Vegetation clearing
		Illegal removal of protected plants
		Heavy transportation of construction material
		Digging of holes of 3m (depth) x 1.4m (width) x 1.4m (width)
		Concrete mixing
	Substation	Clearing of vegetation 4 080m ² (68m x 60m)
		Fencing 2.4m high
		Heavy transportation of construction material and equipment
		Digging of trenches, excavations and casting of foundations
		Installation of equipment
	Metering station	Clearing of vegetation 22m x 22m
		Fencing 2.4m high
		Transportation of construction material and equipment
		Digging of trenches, excavations and casting of foundations
Installation of equipment		
Avifauna		
Impact on Gray's Lark, Ludwig's Bustard, Rüppell's Korhaan habitat.	Physical disturbance of birds and habitat destruction/modification	
Impact on Gray's Lark, Ludwig's	Road Mortality/Poaching	

Bustard, Rüppell's Korhaan		
Impact on Ludwig's Bustard Lesser Flamingo and Greater Flamingo; Great White Pelican Raptors, in particular Lappet-faced Vulture and Martial Eagle	Collision of birds on powerline structures	
Impact on large raptors, including Lappet-faced Vulture; Martial Eagle; Verreaux's Eagle	Electrocution of birds on powerline structures	
Fauna	Forced relocation	Noise and vibration
	Security fence	Interference with small animal movement & electrocution
	OHTL	Interference with animal movement or routes to water sources
	Poaching	
Visual impact	Powerline, Substation and Metering Station	
Land use and value	Development in National Park protected area	
	Conflict with nature-based eco-tourism	
	EPL's	
Waste Management	Hazardous Waste	
	Hydrocarbon Waste	
	Construction waste and building rubble	
	General waste	Littering
Ground and Surface Water Pollution	Hazardous liquid disposal	Fuel leakage of chemicals used on powerlines for corrosion
	Construction waste water	Concrete batching
	Temporary sewage	
Natural Resources Usage	Water consumption	Water required for concrete works
Socio-Economic	Dust and emissions	
	Noise and vibration	
	Traffic & safety	Heavy transport
		Road crossing

	Health & safety & security
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7.4.1.1 Loss of Biodiversity and Habitat Destruction (Flora)

Desert environment is a fragile environment, easily disturbed and takes extended periods to recover. It is thus important that anybody entering the desert must understand the long term consequences of their actions.

The desert ecology is a low energy system, because of limited water. Perennial plants grow slowly, while annual ones grow only in years with adequate rain. As a result, it requires a longer period of time for the vegetation of a disturbed area to recover. **Sensitive areas identified for flora biodiversity are gravel plains covered in lichen fields, drainage lines that have endemic flora species and rocky outcrops that may harbour protected species.**

The most easily disturbed parts of the desert lie within 50 km inland from the coast, where the soil surface consists mostly of gypsum. Although most part of the Project area appears to have no vegetation, the desert surface are covered with a crust of lowly, fog-dependent plants known as lichens. Soil crust lichens are vital to soil stabilisation and primary production. This biological soil crust is vulnerable to disturbance and there is little evidence of the lichen components achieving full recovery following human disturbances in semi-arid to arid environment, much less in hyper-arid desert. (*Lalley and Viles, 2008*) The rainfall is too episodic and sparse for recovery, leading to another place for erosion to begin when infrequent rain does eventually falls. Recovery time is recorded in a range from at least 5 to up to 500 years. (*Lovegrove 1993*). **It is therefore important to make use of existing tracks/roads at all cost and do not drive randomly throughout the area even if it seems like open space.**

Many desert plants may partially escape harsh desert conditions by growing in favourable micro-climates such as dry drainage lines with permanent subterranean water or between rocks with fissures. **It is thus important that vegetation in the drainage lines and rocky outcrops be left intact.**

Other plants survive these harsh conditions of the Namib by being ‘ephemeral’ or short lived. Seeds of these plants can withstand exposure to very high temperatures, whereas the plants themselves would simply wither and die. Thus the seeds can lie dormant for decades, germinating only with the advent of favourable conditions. It is thus important that the topsoil crust is preserved. **Topsoil of holes or trenching should be preserved as a seedbank.**

Collecting of succulent plant species and illegal trade in species are also having an impact on flora biodiversity (*Maggs et al. 1998*), there for **removal or collection of any plants in the Project site is forbidden.**

Table 7.3.1 below presents the comprehensive assessment outcome and suggested mitigation measures to show environmental sensitivity and the high level of commitment required regarding the sensitive flora.

Table 7.3.1: Impact assessment pertaining to loss of biodiversity and habitat destruction (flora)

CRITERIA	DESCRIPTION
Risk Event	Loss of Biodiversity and Habitat Destruction (flora)
Nature of Impact	Negative
Extent	Local
Duration	Permanent
Intensity	Medium
Probability	Highly probable
Significance (no mitigation)	Moderate
Mitigation	<ul style="list-style-type: none"> • Make use of existing tracks/roads at all cost and do not drive randomly throughout the area even if it seems like open space. (could cause damage to unique flora, e.g. lichens or biological soil crust). • Nobody may venture outside the servitude of the project site, temporary construction camp or laydown areas. • Implement and maintain off-road track discipline with maximum speed limits (e.g. 30km/h) as this would limit dust pollution. • Where new tracks have to be made off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks; cross drainage lines at right angles; avoid placing tracks within drainage lines. • Removal or collection of any plants in the Project area is forbidden. • Vegetation in the drainage lines and rocky outcrops be left intact. • Avoid damage to endemic flora occurring in the drainage lines– e.g. <i>Sigophyllum stapfii</i> and <i>Arthroerua leubnitziae</i>. • Vegetation in rocky outcrops be left intact and no collection of unique plants (e.g. <i>Aloe</i> or <i>Hoodia</i> species). • Topsoil of holes or trenching should be preserved as a seedbank. • Inform contractors/workers regarding the above mentioned issues prior to construction activities and monitor for compliance thereof throughout. • Rehabilitate all areas disturbed by the construction activities – i.e. laydown areas, etc. • Draft a Post Construction Rehabilitation and Management Plan in consultation with a Botanist, which should include monitoring. • Implement erosion control measures where applicable – e.g. cross drains on slopes, etc.
Significance (with mitigation)	Low

CRITERIA	DESCRIPTION
Confidence level	High
Legal Implications	Nature Conservation Ordinance No. 4 of 1975, as amended Forest Act No. 12 of 2001, as amended

Given the size of the project footprint within the larger Namib Naukluft Park and the sensitivity of the flora as discussed above, it can be concluded that the potential impact significance to the flora is expected to be **moderate** before mitigation. By doing the suggested mitigations the significance can be reduced to **low**.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.2 Loss of Biodiversity and Habitat Destruction (Fauna)

A high level of species richness, endemism and range-restriction was noticed during the Ecological Baseline Assessment, due to the evolution of adaptation methods to survive in this harsh environment. No particular animal species can be identified as vital to sustaining many of the others; but it is rather their diversity and combined roles in the food web that help to sustain the functioning of the ecosystem. **Thus the survival of even the most inconspicuous species is required for sustainability of micro climates in the harsh desert ecology.**

This is especially the case among insects and reptiles. They have evolved to use condensed fog as a source of water and detritus as source of food when most birds and mammals have not. **No pesticides may be used for powerline maintenance and no species may be trapped, captured or killed.**

Areas on the Project Site identified as habitat for fauna are drainage lines with shrub vegetation and rocky outcrops of granite, schists or dolerite with crevices. **No disturbance of these sensitive habitats is allowed.**

Small rodent species occur to a lesser extent in the Project Area and are restricted to the vegetation of drainage lines and among rocky outcrops. The Project site is less frequented by angulates and predators. The absence of trees or bigger shrubs here prevents them from entering this area of higher anthropogenic movement and activities.

Possible animal movement of angulates and predators can be expected between water sources such as permanent water pools of the Kuiseb and Swakop Rivers. However, these movement paths will be more to the eastern side of the Project Area, once again due to the lack of trees and bigger shrubs and human activity towards the west.

Other than possible local habitat alteration/destruction by the proposed Project, the impact of the proposed OHTL infrastructure is not expected to be detrimental to any of the unique insects, arachnids, reptiles, amphibians or mammals. The footprint of the Overhead Transmission Line, substation and metering station will be small with an existing servitude and access roads already

cleared. The OHTL will not impede animal movement. The Etanago-8 Substation and Metering station will hinder small animal movement to a limited affect due to fencing.

Dust fallout, remote noise and vehicular activity might have negative impacts on biodiversity.

Vertebrate fauna species most likely to be adversely affected by the proposed Project would be bird species, see section 5.2.2 and Appendix F. The impact to birds is assessed as part of the Operational Phase, see section 7.4.2.

Table 7.3.2 below presents the comprehensive assessment outcome and mitigation measures are suggested to show environmental sensitivity and commitment regarding the limited fauna.

Table 7.3.2: Impact assessment pertaining to loss of biodiversity and habitat destruction (fauna)

CRITERIA	DESCRIPTION
Risk Event	Loss of Biodiversity and Habitat Destruction (fauna)
Nature of Impact	Negative
Extent	Local
Duration	Short
Intensity	Low
Probability	Probable
Significance (no mitigation)	Moderate
Mitigation	<ul style="list-style-type: none"> • No pesticides may be used for powerline maintenance. • No fauna species may be trapped, captured or killed. • No the setting of snares, collection of veld foods and or any form of illegal hunting activities. • No killing of species viewed as dangerous such as snakes, scorpions or spiders. • No disturbance of drainage lines or their vegetation or rocky outcrops are allowed. • Monopoles should not be mounted in drainage lines where possible. • Draft a Search and Rescue Management Plan for slow moving vertebrate fauna (e.g. tortoises, chameleon, snakes, etc.) prior to construction. • Select temporary construction camp or laydown areas with care and avoid important habitats (e.g. drainage lines and rocky outcrops). • Select the same site for all of the above to make the footprint of damage as small as possible. • Avoid obstructing surface drainage lines where possible • No workers may be accommodated on site in a Protected Area and workers must be transported daily to and from the Project Site. • Use portable toilets to avoid faecal pollution around camp sites.

CRITERIA	DESCRIPTION
	<ul style="list-style-type: none"> • Initiate a suitable and appropriate refuse removal policy as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios. • Do not drive randomly throughout the area (could cause mortalities to vertebrate fauna). • Avoid off-road driving at night as this increases mortalities of nocturnal species. • Avoid and/or limit the use of lights during nocturnal activities as this could influence and/or affect various nocturnal. Use focused lighting for least effect. • No dogs or cats allowed in Protected Areas. • Liaise with MET staff and an Ecologist throughout the project. • Employ an environmental officer to ensure compliance, especially of the rehabilitation of all the affected areas. • Initiate a mammal electrocution monitoring programme after construction to determine “high risk” areas so as to mitigate these areas as well once identified.
Significance (with mitigation)	Low
Confidence level	High
Legal Implications	Nature Conservation Ordinance No. 4 of 1975, as amended Forest Act No. 12 of 2001, as amended

As all developments have potential negative environmental consequences, identifying the most important fauna species including high risk habitats beforehand, coupled with environmentally acceptable mitigating factors, lessens the overall impact of such development.

Taking into consideration the small footprint of the area to be disturbed by the proposed OHTL and the locality of the Project on the western edge of the Namib Naukluft Park, it can be concluded that the potential impact significance to the fauna is expected to be **low** before mitigation and **very low** after mitigation.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.3 Land use

The significant landscape character and sense of place of the Erongo region plays an important role in the existing and long-term sustainability of the Erongo eco-tourist industry. The area has high levels of unique landscape character which contribute to the beauty of the Namib Desert.

On the other hand, the Erongo region is rich in uranium and other minerals deposits that provide the opportunities for economic development for the region. The Walvis Bay harbour and associated infrastructure also pose vast opportunities for economic development. This can lead to a conflict in land use of this sensitive, arid environment.

To ensure that visitors will be able to experience the natural beauty of the desert and its sense of place it is advised that industrial development and the uranium mining industry reduce its visual impact and to identify ways of avoiding conflict between tourism and prospecting/mining, so that both industries can co-exist in the Central Namib. To this effect Bannerman Mining Resources (Namibia) Pty. Ltd went through great lengths during the public participation process to openly discuss the implications of an open pit uranium mine near Goanikontes. The company was involved in the rehabilitation process of track damage in the area around Goanikontes and assist in grading the access road to Goanikontes and Welwitchia Plains when necessary. (*pers. comm. Werner Evans*)

Development should not prevent the public from visiting the usually accessible areas in the Central Namib for personal recreation and enjoyment. A compromise can be found between the public's need for access and the mines' requirement to safeguard their properties against unauthorised incursions. The proposed 132 kV OHTL will not inhibit access to the Namib Desert. The Etanago-8 Substation and metering station will be fenced in the mining area for security purposes.

Table 7.3.3: Impact assessment pertaining to conflict of interest in land use

CRITERIA	DESCRIPTION
Risk event	Conflict of interest in land use
Nature of Impact	Neutral
Extent	Local
Duration	Permanent
Intensity	Low
Probability	Probable
Significance (no mitigation)	Moderate
Mitigation	<ul style="list-style-type: none"> • The Proponent, Contractors and NamPower is required to adhere to the park rules of Namib Naukluft Park and Dorob National Parks. • The EPL holders should be informed about the intended construction period and the approximate number of people and vehicles that will enter the EPL. • Open communication with the tourism industry to discuss their needs and desirability.
Significance (with mitigation)	Low
Confidence level	Moderate

The significance of the impact of land use of the area is expected to be **moderate** and will be **low** if transparent agreements can be undertaken between interested and affected parties during project life.

7.4.1.4 Ground and Surface Water Pollution

Most of the Project site lies within the Tumas catchment, where surface water flows along shallow drainage lines in a south-westerly direction towards the Swakopmund-Walvis Bay Dune Belt. The regional groundwater flow is also in a south-westerly direction, following the surface drainage towards the Atlantic Ocean. (See Section 5.1.4) In the Project area, however, the groundwater flow is partly directed in a south-westerly direction towards the Swakopmund-Walvis Bay Dune Belt and partly flowing northwards toward the Swakop River. (See Section 5.1.5)

The water level contours obtained from monitoring boreholes on the Etanago-8 mining area indicate a maximum groundwater elevation of 33 m. The basement aquifer is characterized by high groundwater salinities and high natural uranium and radionuclide concentrations. Groundwater in the Project area is not suitable for human consumption. (See Section 5.1.5)

Construction activities are associated with a variety of potential pollution sources (i.e. cement, oils, diesel, chemicals to prevent corrosion, paints, etc.), either having a direct and immediate impact or indirect and longer-term impact. As a single incident, for the downstream ground water to be contaminated, exceptionally large quantities of pollutants will have to be released into the environment, of which the volumes are not associated with this OHTL Project. Although, however small these potential sources of pollution might be, it still requires special attention (i.e. planning, control and management) to avoid any potential pollution of the immediate environment and contributing to the cumulative pollution impacts on downstream resources. Consideration should be given to controlling potentially harmful impacts on surface and groundwater while ‘best’ practice measures are applied to minimise the potential for discharges of pollutants to nearby receiving drainage channels in vicinity of the project site.

Table 7.3.4 below presents the comprehensive assessment outcome.

Table 7.3.4: Impact assessment pertaining to Ground and Surface Water Pollution

CRITERIA	DESCRIPTION
Risk Event	Ground and Surface Water Pollution
Nature of Impact	Negative
Extent	Site specific
Duration	Very short
Intensity	Low
Probability	Improbable

CRITERIA	DESCRIPTION
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Draft and implement a Construction Waste Management Plan to be maintained for the duration of the construction phase. • Waste should be stored in appropriate containers in an appropriately protected area. • Storage and service areas must be sited in areas away from the alluvial sediments and / or drainage channels. • Storage of any material or substance that may cause pollution to water sources should be safely handled and stored in accordance with appropriate legislation. Contractor should submit a Method Statement for the purpose of handling and storage of hazardous materials on-site. • A Storm Water Management Plan should be drafted to be maintained for the duration of the construction time frame. • Ensure proper maintenance of all construction vehicles and equipment and conduct continuous maintenance and check-ups. • Draft and implement a Detailed Preparedness and Emergency Plan for all construction related spillages. • Ensure that oil/ fuel spillages from construction vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. Polluted soil and building rubble must be transported away from the site to an approved and appropriately classified waste disposal site. Polluted soil must be remediated where possible. • Drip trays must be placed underneath construction vehicles when not in use to contain all oil that might be leaking from these vehicles. • If fuel tanks are allowed on site, it must be bunded to 120% of the capacity of the tank to contain any spillages that might take place. • Washing of personnel or any equipment are not allowed on site. Should it be necessary to wash construction equipment these should be done at an area suited and prepared to receive and contain polluted waters. These polluted waters should be transported and disposed at a waste site for hazardous materials. • Appointing qualified and reputable contractors is essential. • Proper training of construction personnel would reduce the possibility of the impact occurring. • ‘Best’ practice measures should be applied to minimise the potential discharge of pollutants onto open soil especially near ephemeral rivers intersected by the proposed power line routes. • Method Statements are compulsory for this aspect of the Construction Phase and should be closely monitored by the Environmental Control Officer (ECO). Various Method Statements (e.g. bunding; concrete batching; bulk earthworks; demolition; fuels and fuel spills; solid waste management; wash areas; storm water management) are required to combat any potential surf/ace and underground water pollution.
Significance (with mitigation)	None

CRITERIA	DESCRIPTION
Confidence level	High
Legal Implications	Water Act No. 54 of 1956, as amended /Soil Conservation Act 76 of 1969 / Hazardous Substances Ordinance No. 14 of 1974, as amended / Public Health Act No. 36 of 1919, as amended

Given the environment's natural characteristics, the scale and nature of the Project's construction activities, construction pollution is expected to have a **low** significance before mitigation and a **none** significance following proper mitigation measures and continues monitoring.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.5 Waste Management

The pristine Namib Desert in the Namib Naukluft Park and surroundings, inclusive of the Project site shows little evidence of general waste (i.e. litter) lying around.

Construction activities are associated with a variety of activities whereby general waste (i.e. plastic, paper, wood pallets, etc.) is created. It is important that proper waste management is in place during construction, as specified with the Construction Environmental Management Plan (Appendix H).

Table 7.3.5: Impact assessment pertaining to Waste Management

CRITERIA	DESCRIPTION
Risk Event	Waste Management
Nature of Impact	Negative
Extent	Local
Duration	Short to medium
Intensity	Low
Probability	Probable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Draft and implement a Construction Waste Management Plan to be maintained for the duration of the construction phase. • Waste bins to be distributed on the project site at strategic points. • Waste bins to be emptied into waste a container that is removed frequently to the municipal dump sites. • Method Statements are compulsory for this aspect of the Construction Phase and should be closely monitored by the Environmental Control Officer (ECO).
Significance (with mitigation)	None

CRITERIA	DESCRIPTION
Confidence level	Medium
Legal Implications	Public Health Act No. 36 of 1919, as amended Health and Safety Regulations GN 156/1997 (GG 1617)

7.4.1.6 Natural Resources (water)

Water for the construction will come from the desalination plant north of Swakopmund. The plant was constructed by Areva to provide water to the Trekkopje Uranium mine. Since the start of the mine's operations has been postponed, a contract was signed with NamWater for the distribution of water to other uranium mines in the Erongo region. Currently Rio Tinto's Rössing, Paladin Energy's Langer Heinrich and Swakop Uranium's Husab mines receive water from this desalination plant. It is envisaged that water will be trucked to the Project Site during the construction phase. (*pers. comm. Werner Evans*)

Water is required for the concrete foundation casted around the footing of the monopole structures with a dimension of 3m (depth) x 2.4m (width) x 2.4m (width) and for the casting of foundations for the Etanago-8 Substation and Metering Station. Although sufficient amount of water is available from the desalination plant, it will be delivered on site at a high cost.

Table 7.3.6 below presents the comprehensive assessment outcome.

Table 7.3.6: Impact assessment pertaining to Natural Resources (Water and Energy)

CRITERIA	DESCRIPTION
Risk Event	Natural Resources (Water)
Nature of Impact	Negative
Extent	Local
Duration	Medium
Intensity	Low
Probability	Definite
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> There should be no tolerance towards water wastage on the Project Site. Water for dust control is not required because of the presence of fog.
Significance (with mitigation)	Low
Confidence level	Medium
Legal Implications	Water Act No. 54 of 1956, as amended

These potential impacts hold **low** significance and can with appropriate mitigations reduce its impact to **very low**.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.7 Socio-Economic Impacts

Socio-economic impacts as a result of a project can have either positive or negative impact on the receiving community. These impacts can be of a financial nature (i.e. employment and income, see Section 4.10.1 and 7.1.1.1), an educational nature (i.e. education and skills transfer), a health nature (i.e. electric and magnetic fields, see Section 7.1.1.4 or dust nuisance), a safety nature (i.e. traffic; crime), etc.

7.4.1.7.1 Financial Impact

According to the 2011 National Housing and Population Census Preliminary Results, the Erongo Region has a population of 150 400 people, resulting in a 39,7 % growth rate for the period 2001-2011. It predicts an increase in the demand for employment, food, housing, etc., while unemployment is estimated at 25,5 %. (Namibia Statistics Agency, 2012)

Construction activities are associated with a variety of employment and skills transfer, as well as economic spin-offs (i.e. small and medium contractors), which in the case of this Project is also expected. It is expected that about 20-50 new jobs (temporary in nature) will be created during construction. It is important that local people be employed and that the necessary opportunities exist for unskilled labour to undergo on the job training and skills enhancement.

The positive socio-economic impacts associated with the proposed Project have been covered in section 4.10.1.

7.4.1.7.2 Nuisance (dust and emissions)

The desert pavement and biological soil crust of the *Central Namib* have the effect of binding the surface of the soil into a mat that is not easily penetrated by wind. It has the effect of reducing erosion of fine-grained soil material and thereby minimising dust generation during strong winds. Low levels of airborne dust are a feature of the *Central Namib* compared to other deserts, and the desert pavement and biological soil crust play an important part in maintaining it.

Air quality in the area is considered good. Strict monitoring of air quality is undertaken by uranium mines in the vicinity to determine, based on the potential impact that current activities in the area might have on air quality. Sources identified as possibly impacting on air quality in the region included, but are not limited to: • Fugitive emissions from mining operations; • Fugitive emissions from vehicles on mine and national unpaved roads; and • Wind erosion of open areas. (Speicer, 2021)

Considering the prevailing climatic conditions throughout the year (see section 5.1.1) and the surrounding distant receptors, dust and emissions nuisance caused by the construction of the OHTL is not expected to be of any significance.

If workers are exposed to dust and emissions during construction, the necessary protective gear, as required by the Public Health Act (No. 36 of 1919) and Labour Act (No. 11 of 200) should be issued. Dust control is considered important (i.e. Atmospheric Pollution Prevention Ordinance No 11 of 1976, as amended & Public Health Act No. 36 of 1919, as amended).

Table 7.3.7 below presents the comprehensive assessment outcome.

Table 7.3.7: Impact assessment pertaining to dust and emissions

CRITERIA	DESCRIPTION
Risk event	Dust and emissions
Nature of Impact	Negative
Extent	Site specific
Duration	Short
Intensity	Low
Probability	Improbable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Dust suppression, if and when required, should minimise dust impacts mainly with respect to the contractor’s staff. • Removal of vegetation and damage of biological soil crust should be restricted to the minimum and what is necessary. • Construction activities during high winds should be limited to those activities not generating dust. • Handling and transport of erodible materials should be avoided under high wind conditions. • Where possible, topsoil stockpiles should be in sheltered areas and covered. • Appropriate dust suppression measures should be used when dust generation is unavoidable particularly during prolonged dry periods in summer. Such measures shall also include the use of temporary stabilising measures. • No fires should be allowed on-site for any what purpose and construction waste are not allowed to be burned on-site. • It is imperative that all machinery and vehicles on site is road worthy and do not give rise to excessive smoke or emissions. • The contractor’s personnel are to be provided with access to dust

CRITERIA	DESCRIPTION
	masks.
Significance (with mitigation)	Low - none
Confidence level	High
Legal Implications	Atmospheric Pollution Prevention Ordinance No 11 of 1976, as amended Public Health Act No. 36 of 1919, as amended Health and Safety Regulations GN 156/1997 (GG 1617) Labour Act No. 11 of 2007, as amended

Given the expected scale of dust generation activities and the distance to the nearest receiver, dust and emissions from construction activities, being temporary in nature are expected to have a **low** pre-mitigation impact significance rating and **low to none** post-mitigation.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.7.3 Nuisance (Noise & Vibration)

Noises and vibrations can be caused during the construction phase, as heavy construction vehicles and machinery operates. The effect of noises during the construction phase is experienced by the surrounding receptors and/or the on-site construction personnel. The scale of the construction activities and type of construction activity, as well as the locality of the surrounding receptors determine the significance to this construction activity.

Workers exposed to loud noises during construction should be issued with the necessary protective gear, as required by the Public Health Act (No. 36 of 1919) and Labour Act (No. 11 of 200).

The nature of the construction activities for this Project is not associated with any large scale or high intensity noise activities. No blasting is intended as part of the construction phase. The noises expected from the construction phase are to be very similar to other existing noises.

The severity of these impacts is likely to be more significant to those receptors living close by, compared to those further away. With the closest populated area located about 25km to the north-west of the Project Site, it is not envisaged that noise and vibration would have a significant impact on people.

Table 7.3.8 below presents the comprehensive assessment outcome.

Table 7.3.8: Impact assessment pertaining to noise and vibration

CRITERIA	DESCRIPTION
Risk event	Noise and Vibration
Nature of Impact	Negative
Extent	Site specific
Duration	Short
Intensity	None
Probability	Probable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Appropriate directional and intensity settings are to be maintained on all hooters and sirens. • No amplified music should be allowed on site. • The contractor shall not use sound amplification equipment on site unless in emergency situations. • Limit construction times to acceptable daylight hours. • The World Health Organization (WHO) guideline on maximum noise levels (guidelines for Community Noise, 1999) to prevent hearing impairment can be followed during the construction phase. This limits noise levels to an average of 70db over a 24-hour period with maximum noise levels not exceeding 110db during the period. • All construction vehicles and machinery should be kept in good working condition. If any noise-related complaints are registered the applicable construction vehicles and machinery should be fitted with noise reduction devices. • Personnel working in noisy environments must be issued with hearing protectors.
Significance (with mitigation)	Low-none
Confidence level	High

Given the small scale of the Project and resulting construction activities; the construction period being temporary, the existing sources of noise ‘pollution’ and distance from towns, the potential impact is regarded as having **low-none** significance after mitigation.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.7.4 Traffic & Safety

Given the dominant nature of activities, mining and related, heavy transport vehicles are part of C28’s daily traffic.

Construction activities are associated with an increase in vehicles of different kinds (i.e. workers’ busses, delivery vehicles and construction vehicles) to and from the site, which inevitably increase risk and conflict, although temporary in nature.

The C28 is a prominent route providing access to the Langer Heinrich Uranium mine and the Namib Naukluft Park.

The proposed Project and envisaged mine is expected to have a cumulative impact as a result of increased construction vehicle movement within the larger area.

The significance of this conflict on the C28 road is expected to be low due to the Project’s small scale and resulting required construction vehicle movement. However, all intersections and junctions should be considered dangerous and requires caution from both the construction vehicle drivers and other road users. Strict road safety measures will have to be applied during the construction phase, as per the Construction Environmental Management Plan (Appendix H).

Table 7.3.9 below presents the comprehensive assessment outcome.

Table 7.3.9: Impact assessment pertaining to traffic and pedestrian safety

CRITERIA	DESCRIPTION
Risk event	Traffic and Safety
Nature of Impact	Negative
Extent	Regional
Duration	Medium
Intensity	Low
Probability	Probable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Contractor’s personnel should adhere to speed limits. • Appropriate signs should be in place along the roads being used by construction vehicles notifying road users of the construction activity and roads used by construction vehicles. • Drivers of construction vehicles should have valid driver’s licenses with ample experience on proper road usage and manners on-site as well as when making use of public roads. • Construction vehicles’ need to be in a road worthy condition and maintained throughout the construction phase. • Make use of predetermined roads to the site and refrain from creating new roads. • The movement of heavy vehicles from and to the site must occur outside of peak traffic hours (thus after 08h30 and before 16h30). Delivery vehicles should preferably stick to the same times to avoid

CRITERIA	DESCRIPTION
	peak hour traffic and resulting nuisance to residents. <ul style="list-style-type: none"> • Provide traffic signals and road markings where necessary to ensure safe traffic movement.
Significance (with mitigation)	Very Low
Confidence level	High

The pre-mitigation impact is regarded as **low**, which can be reduced to **very low** after appropriate mitigation measures have been implemented.

Construction activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.1.7.5 General Health, Safety & Security

Construction activities are associated with a variety of potential negative implications to the nearby residents, their animals and the construction staff’s health, safety and security.

Open trenches and other constructions during the construction phase may pose a safety and health implication and should be properly mitigated for the duration of the construction phase.

Construction of the proposed 132 kV OHTL has the potential for accidental injury, either minor or major accidents, to construction workers. On-site safety of all personnel is an important responsibility of the appointed contractor and should be adhered to in accordance with the requirements of the Labour Act (No 11 of 2007) and the Public Health Act (No. 36 of 1919). Ensuring that the construction activities do not pose any danger to humans or animals is important. The contractor’s site and construction site should be properly secured to prevent any injury or harm to the people and/or any local fauna.

The significance is directly related to the duration of the construction period, nature of associated activities and general accessibility of the site, which in this case is considered small in the isolated desert environment.

Table 7.3.10 below presents the comprehensive assessment outcome.

Table 7.3.10: Impact assessment pertaining to health, safety, and security

CRITERIA	DESCRIPTION
Risk event	Health, Safety and Security
Nature of Impact	Negative
Extent	Local
Duration	Medium

CRITERIA	DESCRIPTION
Intensity	Low
Probability	Probable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Ensure that all construction personnel are trained depending on the nature of their work. • Provide for a first aid kit and trained person to apply first aid when necessary. A wellness program should be initiated to raise awareness on health issues. • Restrict unauthorised access to the site and implement access control measures. • Clearly demarcate the construction site boundaries along with signage of no unauthorised access. • Clearly demarcate dangerous areas and no-go areas on site. • Staff and visitors to the site must be fully aware of all health safety measures and emergency procedures. • The contractor must comply with all applicable occupational health and safety requirements. The workforce should be provided with all necessary Personal Protective Equipment including masks and earplugs. • All affected landowners should be notified at least one month in advance who the appointed contractor is and provided with details about the proposed construction activities and timeline.
Significance (with mitigation)	Low-none
Confidence level	High

These potential impacts hold **low** significance and can with appropriate mitigations reduce its impact to **very low**.

7.4.2 POSSIBLE IMPACTS DURING OPERATIONAL PHASE

The operational phase of the proposed Project entails predominantly:

- Clearance of vegetation along the power line servitude and within the fenced-in area of the substation and metering station site;
- Bi-monthly inspections to check for signs of wear and tear, which is done by vehicle and foot;
- Replacement of damaged or malfunctioning infrastructure; and
- Emergency maintenance.

The operational activities associated with the proposed Project are presented in section 4.7.

Details with regards to the potential impacts expected during the operational phase are listed in Table 7.4, below. Mitigation measures and environmental requirements having direct relevance to the expected operational phase impacts are presented in Tables 7.4.1 to 7.4.3 below. Detailed mitigation measures and environmental requirements having direct relevance to the expected operational phase impacts are presented in the Operational Environmental Management Plan (Appendix H).

Table 7.4 - Potential impacts expected during the Operational Phase

IMPACT	CAUSE
Loss of biodiversity and habitat destruction	Removal of flora as part of site maintenance
	Avifauna collision to powerline
Visual impact	Overhead Transmission Line infrastructures, Etanago-8-8 Substation and Metering Station
Waste Management	Faulty equipment
	Littering
Ground and surface water pollution	Waste disposal
	Hazardous material & liquid disposal during maintenance operations
General health and safety	Electrocution
	Security
General maintenance	Metal corrosion and pollution management for OHTL materials, components and structures.
	Management of dust deposits, corrosive deposits, wetting and moisture deposits, etc. This usually necessitates frequent intervention to maintain the power line.
	Management of servitude primarily to deal with wash away, water erosion, wind erosion s well as sand deposits

7.4.2.1 Habitat Destruction and Loss of Biodiversity (Flora and Fauna)

Vegetation management applicable to the Project site basically entails keeping vegetation clear to interfere with the operation of equipment (see section 4.7)

Considering the desert soil crust for most part of the proposed 132 kV OHTL, very little interference is expected from the side of vegetation on equipment. Vegetation management by means of chemical sprays are prohibited in National Parks. It is important that a Vegetation and Habitat Management Plan be drafted, which should form part of the Project's O&M Plan, according to which external operational monitoring will be done.

Irresponsible behaviour (e.g. uncontrolled access to sensitive areas; collecting of plants or animals; killing of snakes, use of general poison, setting of fires, littering, pollution, destructive driving with quad and/or vehicles, etc.) will not be allowed and/or tolerated in the protected area.

7.4.2.2 Loss of Biodiversity and Habitat Destruction (Avifauna)

Risk assessment and mitigation efforts are directed towards priority species, namely those that have a high biological significance, i.e. primarily Red Data species (including any with migrant status) and/or endemic or near-endemic species. Within the study area, 19 priority bird species are regarded as potentially at higher risk from the proposed development. These include 11 Red-listed species (namely four raptors, one large terrestrial [cursorial] species and six aquatic species) and two species that are near-endemic to Namibia. Several other non Red-listed species that are potentially power line-sensitive also occur in the study area. Of the above, the species considered at the highest risk are Ludwig's Bustard, Lesser Flamingo, Greater Flamingo and Great White Pelican.

The routing of the power line across drainage lines would increase the collision risk. Sections of the proposed power line that are considered particularly at risk in terms of bird collisions include three large drainage lines on the Kuiseb - Walmund section of power line to the south, and four more such drainage lines on the Walmund - Etanago-8 section to the north. The GPS points of these 7 sensitive sections of the OHTL are provided in table 7.4.1 below:

Table 7.4.1 - GPS Co-ordinates for sensitive Drainage Lines on the Proposed OHTL Route

Drainage no.	GPS start	GPS end	Distance (km)
Kuiseb Substation to Walmund Substation			
1	22.908184S / 14.725038E	22.883616S / 14.726564E	2.70
2	22.849792S / 14.729416E	22.825346S / 14.730382E	2.75
3	22.784689S / 14.733038E	22.776693S / 14.733543E	0.90
Walmund Substation to Etanago Substation			
4	22.766489S / 14.740220E	22.752622S / 14.739693E	1.50
5	22.741078S / 14.739271E	22.736744S / 14.740223E	0.60
6	22.736784S / 14.743710E	22.736784S / 14.747771E	0.40

7	22.736788S / 14.752872E	22.736785S / 14.762610E	1.00
Total			9.85

These sensitive sections of the OHTL are indicated as green markers in Figure 5.1 and 5.2 of this ESR and discussed in detail in the Avifauna Impact Assessment report in Appendix F)

The proposed steel monopole structure has large clearances, but if the poles are made of steel, and earthed, a large bird sitting on the insulator would be at risk to electrocution, especially if the structure is wet or damp from fog. However, the use of these structures as perches by raptors in this area is likely to be relatively low. Disturbance and habitat destruction/modification (for instance of vegetated areas), poaching and road mortality are further threats during construction.

With the growing number of power lines being constructed in the Project area, many of which converge at the Kuiseb and Walmund Substations, it can be expected that cumulative impacts will increase, in particular avifauna collisions.

In terms of line configuration, it should be noted that there is still uncertainty on the preferred option. If lines are clustered together, it would be more visible and birds need to make only a single ascent and descent to cross a series of lines in this arrangement. However, increased visibility also goes hand in hand with increased size/height of the physical barrier. In periods of decreased visibility, the hazard to birds may thus be greater, as the cluster of structures would form a virtual physical obstacle course, especially when flocks of birds are flying at different heights.

The risk still remains on each individual structure, regardless of whether it is grouped or not, and this risk can become cumulative. This route configuration recommendation is therefore also dependent on the effective application of the marking mitigation, as recommended below. Ongoing monitoring is essential in order to identify the effectiveness of mitigation, and any need for additional intervention.

Table 7.4.2: Impact assessment pertaining to loss of biodiversity and habitat destruction (avifauna)

CRITERIA	DESCRIPTION
Risk Event	Loss of Biodiversity and Habitat Destruction (avifauna)
Nature of Impact	Negative
Extent	Regional
Duration	Long
Intensity	Medium
Probability	Highly probable

CRITERIA	DESCRIPTION
Significance (no mitigation)	Moderate
Mitigation	<p>Physical disturbance of birds and habitat destruction/modification:</p> <ul style="list-style-type: none"> • Before construction starts, the proposed power line route should be inspected by an Ecologist for any signs of bird nesting activity. Disturbance of nesting birds, in particular Gray's Lark and Rüppell's Korhaan in sensitive wash areas, should be avoided. • Where possible, the unnecessary destruction of habitat or degradation of the environment, including sensitive habitats such as ephemeral drainage systems, should be avoided. • Ongoing awareness should be promoted about the value of biodiversity and the negative impacts of disturbance and habitat destruction, especially to breeding birds. <p>Road mortality/poaching of birds:</p> <ul style="list-style-type: none"> • Ongoing awareness should be promoted about the value of biodiversity and the negative impacts of poaching and road mortality. • A speed limit should be strictly enforced. • Anti-poaching measures should be strictly enforced, with zero tolerance, and this should be emphasised during induction to contractors; offenders should be prosecuted. <p>Collisions of birds on the power line structures</p> <ul style="list-style-type: none"> • To address the collision risk on the proposed 132 kV transmission line, the marking of the sensitive sections of the proposed transmission line to increase visibility is recommended. • The sensitive areas to be marked are indicated in Table 7.4.1 and Fig. 5.1 and 5.2 of this report. • The top OPGW (earth/ground) wire should be marked, for the full length of each span. • Recommended marking devices include the following, all made by Preformed Line Products: <ul style="list-style-type: none"> • Large SWAN-FLIGHT Diverter (SFD); alternating with • Viper Live Bird Flapper ("Viper") • The marking distance between devices should be 10 m and the design/colours offset where possible (e.g. black and white). • At this stage, no nocturnally visible marking is recommended, but it should become mandatory should monitoring results indicate the necessity (e.g. repeat collisions of any nocturnal fliers such as flamingos). • The intention is to mark stay wires with yellow tubing (BID 2021). The need for fitting further mitigation for collisions on stay wires should also be based on monitoring results. • The need for reporting power line incidents should be stressed, and reporting procedures clarified. Should monitoring indicate that collisions are still taking place despite the above marking, further mitigation would need to be investigated. <p>Electrocutions of birds on associated power line structures</p>

CRITERIA	DESCRIPTION
	<ul style="list-style-type: none"> • Electrocutions are possible on the 132 kV steel monopole structure. No mitigation for this impact is recommended at this stage, due to the relatively low reporting rates for large raptors in the area. However, ongoing monitoring is essential. • The H-pole structure carries a potential electrocution risk, and the conductors should therefore be insulated for at least 2 m in the section at the pole. • Any jumpers (e.g. on angle poles and H-poles) should also be insulated. • Standard mitigation measures apply for most structures associated with substations and transformers, which should ideally be designed in such a way that they are not attractive as bird perches/nesting sites; selected live components should be insulated (e.g. using PVC piping or low-density polyethylene pipe [LDPE]). • The need for monitoring and reporting power line incidents should be stressed, and reporting procedures clarified (see Section 10.2 Monitoring below). <p>Impacts on the power supply due to bird nesting and other activities</p> <ul style="list-style-type: none"> • No mitigation is recommended at this stage, but monitoring is essential to identify (potential) problem areas (see Section 9.2 Monitoring below). • Should any nesting or other activity by crows cause disruptions of the power supply, consult with the Ministry of Environment, Forestry and Tourism (MEFT) in order to discourage and manage such activities, e.g. by removing nests after the nesting season (if applicable). • Ensure strict and effective waste management during construction activities, to discourage an increase in scavenging species such as Pied Crow.
Significance (with mitigation)	Low
Confidence level	High
Legal Implications	Nature Conservation Ordinance No. 4 of 1975, as amended Forest Act No. 12 of 2001, as amended

Any power line is potentially lethal, and this does not depend on the size of the structure nor its capacity. Consequently, potential impacts on birds should form an important consideration with regard to the construction of any new power line.

Taking into consideration the size of the Project that will join an existing infrastructure corridor, the potential impact significance of the proposed OHTL on avifauna biodiversity is expected to be **moderate** before mitigation and **low** after mitigation.

Operational activities should comply with the requirements as set-out in the Construction Environmental Management Plan (Appendix H).

7.4.2.3 Visual Impact and Sense of Place

The visual aesthetics and as a result the sense of place, correlates with the land uses and related infrastructure (see section 5.4), which is a combination of protected area, mining/prospecting and industrial infrastructure development.

Sense of place is formed from a combination of attributes such as space, visual, noise, biodiversity and geology. The combined impacts (both direct and indirect) of all the activities taking place in and around the proposed Etanago-8 Uranium Mine site have the potential to profoundly alter the way people perceive and use this section of the National Park, affecting both peoples' psyche and some people's livelihoods.

The cumulative visual impact of mining and industrial development in the region can affect the sense of place. It is vital that the combined effects of these developments do not start to dominate the natural landscape features for which the Namib Desert is world renowned.

For most part of the propose 132 kV OHTL, it will follow the servitude of existing OHTLs and here the area is not pristine in the sense that there is a service road, two 220 kV and two 66 kV Overhead Transmission Lines already. From Kuiseb Substation to Walmund Substation, this OHTL corridor cannot be seen from the newly constructed D1984 highway. Walmund Substation and the northern part of the proposed 132 kV OHTL can be seen from the C28 where the OHTL will cross the road, but still as part of an already exiting OHTL corridor.

The north-eastern part of the proposed OHTL where the line turns east towards Etanago-8 Substation, will be through virgin land for approximately 4,9 km.

This north-eastern part of the proposed 132 kV OHTL will be seen from the Goanikontes Viewpoint looking south, which is approximately 4 km north of the Etanago-8 Substation at an elevation of 317 m. It will be seen as part of the mine development and the proposed OHTL will be slightly visible in the distance (4 km away) as it crosses the plains towards the existing OHTL corridor.

Visual impact assessment is undertaken in Table 7.4.3 to show environmental sensitivity and commitment regarding the fauna.

Table 7.4.3: Impact assessment pertaining to visual aesthetics and sense of place

CRITERIA	DESCRIPTION
Risk event	Visual aesthetics and sense of place
Nature of Impact	Negative
Extent	Local
Duration	Permanent
Intensity	Low

CRITERIA	DESCRIPTION
Probability	Highly Probable
Significance (no mitigation)	Low
Mitigation	It is expected that the monopole structures that are galvanised in sink (for corrosion) will blend in sufficiently with the landscape and not be adversely visible from the Goanikontes viewpoint.
Significance (with mitigation)	Low
Confidence level	High

The significance of the pre-mitigation visual impact of the proposed 132 kVOHTL on the area during the operational phase is expected to be **low** and will remain **low** during project life.

7.4.2.4 Ground and Surface Water Pollution

Ground and surface water flow in the Project area is either towards the Swakopmund-Walvis Bay Dune Belt or toward the Swakop River. (see Section 5.1.4 and 5.1.5)

Possible sources of pollution of maintenance during the Operational Phase are the transformers and other equipment holding oils. Routine inspections to ensure timely observation of leakage should be carried out and included into the O&M Manual. Other sources of potential pollution, however small include but are not limited to hazardous liquids (i.e. diesel/petrol/cleaning liquids) stored at the Project site; improper storage of general waste and dumping of waste within open areas.

Consideration should be given to controlling potentially harmful impacts on surface and groundwater while 'best' practice measures are applied to minimise the potential for discharges of pollutants to nearby receiving drainage channels in vicinity of the project site.

Mitigation measures are suggested in Table 7.5.3 to show environmental sensitivity and commitment regarding the fauna.

Table 7.4.4. below presents the comprehensive assessment outcome.

Table 7.4.4: Impact assessment pertaining to Ground and Surface Water Pollution

CRITERIA	DESCRIPTION
Risk Event	Ground and Surface Water Pollution
Nature of Impact	Negative
Extent	Site specific

CRITERIA	DESCRIPTION
Duration	Very short
Intensity	Low
Probability	Improbable
Significance (no mitigation)	Low
Mitigation	<ul style="list-style-type: none"> • Draft and implement a Waste Management Plan. • No littering in a protected area. • Ensure proper maintenance of all vehicles and equipment and conduct continuous maintenance and check-ups. • Draft and implement a Detailed Preparedness and Emergency Plan for all operational related spillages. • Ensure that oil/ fuel spillages from vehicles and machinery are minimised and that where these occur, that they are appropriately dealt with. Polluted soil and building rubble must be transported away from the site to an approved and appropriately classified waste disposal site. Polluted soil must be remediated where possible. • Drip trays must be placed underneath vehicles when if oil is leaking from these vehicles. • Washing of personnel or any equipment are not allowed on site. • Appointing qualified and reputable technicians is essential. • Proper training of personnel would reduce the possibility of the impact occurring. • ‘Best’ practice measures should be applied to minimise the potential discharge of pollutants onto open soil especially near ephemeral rivers intersected by the proposed OHTL route.
Significance (with mitigation)	None
Confidence level	High
Legal Implications	Water Act No. 54 of 1956, as amended /Soil Conservation Act 76 of 1969 / Hazardous Substances Ordinance No. 14 of 1974, as amended / Public Health Act No. 36 of 1919, as amended

Given the environment’s natural characteristics, the scale and nature of the Project’s operational activities, pollution is expected to have a **low** significance before mitigation and a **none** significance following proper mitigation measures and continues monitoring.

7.4.2.5 General Health & Safety

The operational activities and maintenance operations of a 132 kV OHTL can have safety and health impacts on people. Electrocutation during maintenance is a real danger and should be done as per the O&M Manual by qualified and authorised personnel only.

Inspections and routine maintenance operations should not be done during time of potential bad weather.

Several sources of combustion exist on an OHTL, the most common being electrical fire others including combustible materials and flammable liquids. All personnel need to be fully aware of what to do to both avoid the risk of fire and what to do in the event of a fire.

7.4.2.6 General Maintenance of Project

The OHTL and Etanago-8 Substation and Metering Station is located in a climate that typically entails harsh environmental conditions. Fog moves into the Project area for more than 100 days a year, which brings moist air that condensate on the infrastructure to form water.



Photo 7.4.1 – Water forms at the base of the OHTL from fog that condensate on the steel structures

Source Transmission Consulting Services (TCS)

During the day temperatures rise and evaporation takes place to leave behind an arid environment. The wind is a prevailing factor in this harsh climate. These are all environmental factors to

consider that will influence the maintenance of the Project and necessitates frequent intervention to maintain the power line.

The steel poles that will be used is galvanised in sink during manufacturing to prevent the corrosive action of the environment. (*pers. comm. Riaan van Zyl*)

Management of the servitude will not have to deal with vegetation removal like in other climatic zones. It will primarily to deal with water erosion, wash away, wind erosion and sand deposits. Rehabilitation of damaged areas are important to stabilize the biological soil crust of the area.

Transformers and other electrical equipment may contain hazardous substances (such as Polychlorinated Biphenyls (PCB) to provide electrical isolation. Appropriate storage, decontamination and disposal of such hazardous material must be undertaken. (*IFC, 2007*)

7.5 DECOMMISSIONING AND CLOSURE

The project life of the Etanago-8 Uranium Mine is envisaged to be 14-17 years. On mine closure, it is anticipated that no future alternative land uses are likely to be considered as the mine is within the Namib Naukluft National Park. (*Speicer, 2012*)

The 132 kV OHTL will become the property of NamPower after 10 years and it is envisaged the OHTL will continue to be used as part of the West Coast electricity network.

If the OHTL from Walmund Substation will not form part of the regional electricity network, it will be the responsibility of the Proponent to undertake the decommissioning, which will be done as per the Proponent's Decommissioning & Rehabilitation Plan. It is recommended that a Botanist and Ecologist be involved to advice on how to go about restoring the servitude area to its original condition.

A complete decommissioning exercise, which should be covered by the Decommissioning & Rehabilitation Plan should involve as a minimum:

- Demolishing and removal of all temporary and permanent structures;
- Disposing of building rubble;
- Preparation of disturbed areas and recovery of biological soil crust;
- Search and relocate of local indigenous vegetation onto the site;
- Rehabilitated vegetation patch; and
- Rehabilitation monitoring.

Given the nature of the activities associated with decommissioning, the expected impacts are very similar to that of the construction phase (see section 7.4.1), as is the case with the required mitigations to be applied.

The decommissioning phase should include a detailed Decommissioning & Rehabilitation Plan, which should include rehabilitation monitoring for a period of at least 5 years after date of decommissioning completion. This must be included into the rehabilitation budget and allocated to this particular component of the Project's financial liability.

7.6 CUMULATIVE IMPACTS

Cumulative impacts are defined as “*those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as developments when added to other existing, planned, and/or reasonably anticipated future ones*”. The significance thereof is determined by the nature and the scale of the proposed Project's activities contributing to this 'cumulative impact/s' and the sensitivity of the receiving environment.

Cumulative impacts are an important consideration, including the increase in linear infrastructure in the study area and the increasing effects of other human activities. The clustering of existing infrastructure in the Project area, including other power lines, the road and railway networks, pipelines, communication masts, as well as other developments such as mines, would increase the cumulative effect of any impacts associated with the present development. One cumulative impact that is being highlighted in the present study is the growing number of power lines being constructed, both transmission and distribution lines. Many of these converge at the Kuiseb Substation and Walmund Substation, thereby increasing the cumulative impacts, in particular of avifauna collisions, vegetation and habitat loss and visual impact.

In terms of line configuration, it should be noted that there is still considerable debate, but few supporting data, on the preferred option. It has been suggested that clustering the lines (i.e. several utility lines sharing a common servitude) may be preferable, because the concentration of lines renders it more visible; birds then need to make only a single ascent and descent to cross a series of lines in this arrangement. The problem is that increased visibility also goes hand in hand with increased size/height of the physical barrier. In periods of decreased visibility, the hazard to birds may thus be greater, as the cluster of structures would form a virtual physical obstacle course, especially when flocks of birds are flying at different heights. (*Scott&Scott, 2021*)

Ongoing monitoring is essential in order to identify the effectiveness of mitigation, and any need for additional intervention. The NamPower/Namibia Nature Foundation Strategic Partnership monitors interactions between wildlife and power supply infrastructure in Namibia to identify the extent of the impact, possible mitigation measures to avoid powerline incidents. Although recorded mortalities may be in low numbers, the cumulative impacts of any negative interactions over the entire lifespan of the power line are an important consideration.

The database forms the basis for informed recommendations on the application of targeted mitigation measures.

The construction of the new Walvis Bay - Swakopmund road highway and flyover west and north-west of the power line servitude has added to the cumulative impacts, including habitat loss

(particularly in sensitive wash areas) and disturbance during construction, and ongoing disturbance during operation.

From this scoping assessment conducted, four potential cumulative impacts can be expected, as outlined below –

- Increased loss of habitat and vegetation (Negative);
- Increased bird mortalities (collisions with powerlines) (Negative);
- Increased visual impact (Negative);
- Employment creation & skills transfer (Positive).

Considering the evaluation and assessment (i.e. nature and the scale of the proposed Project's activities and the sensitivity of the receiving environment) that was done for each of the negative (N) impacts (see section 7.4), as listed above in bullet format, the cumulative impacts are expected to be of '**low**' significance, with appropriate mitigation and continues monitoring, as recommended.

8 CONCLUSIONS & RECOMMENDATIONS

This chapter of the report presents the assessment conclusion following the scoping phase, as well as the key recommendations and the environmental statement for consideration by the authorities. The conclusion and recommendations as presented in this chapter have been drawn from the assessment outcome, as presented in Chapter 7.

8.1 CONCLUSIONS

It is the conclusion of the Environmental Scoping Assessment that this Project has the potential to contribute positively to the Country's economic development. The Project has the potential to assist Bannerman Etanago-8 Uranium Mine to develop, while ensuring a security in the supply of electricity that enable the operation of the mine over the medium and long term. These positive impacts are presented in section 7.1 of this Report.

Apart from the positive contribution, as highlighted above, the Project will have negative impacts as well, as presented in Chapter 7, above.

The greatest potential negative impact is expected to be as a result loss of biodiversity through avifauna collisions to the powerline.

Considering the scale of the Project it can be concluded that the proposed 132 kV OHTL, Etango-8 Substation and Metering Station will have a permanent impact (until decommissioning) of a **'low** significance after mitigation (see section 7.4.1.1) to the avifauna as a whole. Mitigation measures and recommendations have been prescribed in this report (and the EMP – Appendix H) to reduce the significance of these key impacts (among others) to acceptable levels.

Based on the project information as provided by the Proponent, Consulting Engineers and specialist inputs, the nature and extend of the Project, setting the sensitivity of the receiving environment, this scoping study concludes that there is currently no evidence indicating that any of the impacts identified (see sections 7.4.1 & 7.4.2) are of such significance that it cannot be reasonably mitigated and that the proposed Project, as presented in this report, should not be allowed to continue. It is however required that the mitigations and recommendations as presented in this report and the EMP be first approved by the Environmental Commissioner before the Project can commence.

The findings of this scoping phase conclude that no further detailed assessments are required.

Given this, it is not to say that there will be no further impact/s and potential threats as highlighted by the study. Construction, operations and decommissioning and closure activities need to be strictly controlled by the Proponent and Contractor/s, and monitored by the appointed specialist and applicable Competent Authority to ensure that all potential impacts identified in this study and other impacts that might arise during implementation are properly identified in time and addressed in an effective manner.

8.2 RECOMMENDATIONS

Without downplaying the importance of the larger area's unique biodiversity, it is the conclusion and recommendation that this Project be granted an ECC, subject to the following recommendations and final approval by the Environmental Commissioner as per the Environmental Management Act, No. 7 of 2007.

1. All required permits, licenses and approvals (see section 3.4) for the Project be obtained before commencement.
2. All mitigations listed in Tables 7.4.1 to 7.4.10 and Tables 7.5.1 to 7.5.3 and those included in the Environmental Management Plan (Appendix H) be implemented, as applicable.
3. An Environmental Control Officer should be appointed for the construction phase of the Project to make sure all the requirements within the Scoping Report and Environmental Management Plans (Appendix H) are strictly adhered to.
4. An Environmental Site Manager should be appointed during the course of the construction phase to make sure that all the requirements as listed within this scoping report and the EMP (Appendix H) are adhered to.
5. Continued on-site monitoring and evaluation be conducted during the construction and operational phases to be authorised by the DEA.

8.3 ENVIRONMENTAL STATEMENT

Based on the information presented in this scoping report, the Environmental Assessment Practitioner is of the opinion that the immediate and larger environment will not be significantly impacted if the above recommendations as proposed in this report are implemented and monitored, and responsible environmental practises are applied by the Developer, Proponent, appointed contractors and sub-consultants.

Urban Green cc, the independent environmental assessment practitioner, recommends to the relevant authorities that the application for the listed activities associated with the proposed 132 kV OHTL, Etango-8 Substation and Metering Station be approved on condition that the above recommendations (Section 8.2) are met and that continuous monitoring be conducted in accordance with the Environmental Management Act (Act No. 7 of 2007), its EIA Regulations and this scoping report. It is important that proof of monitoring is submitted to the office of the Environmental Commissioner to be used as part of the review process pertaining to the 3-yearly ECC renewal.

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