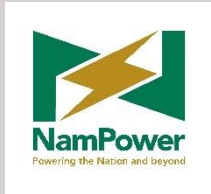



Nov
2023

Draft Environmental and Social Impact Assessment for the Proposed 400 kV Auas-Kokerboom Transmission Line

VOLUME 1 OF 3
DRAFT ESIA MAIN REPORT



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PROJECT NAME	Environmental and Social Assessment for the Proposed Auas-Kokerboom 400 kV Transmission Line
STAGE OF REPORT	Draft Environmental and Social Impact Assessment Report
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DATE OF SUBMISSION	November 2023
CONTRIBUTORS TO THE REPORT	Stephanie van Zyl, Eddy Kuliwoye (Mapping)

DECLARATION

I hereby declare that I:

- have knowledge of and experience in conducting assessments, including knowledge of the Environmental Management Act (7 of 2007), its regulations and guidelines that have relevance to the proposed activity;
- have performed the work relating to the application in an objective manner, regardless of whether or not the views and findings were favourable to the applicant;
- have complied with the Act, and its regulations, guidelines and other applicable laws.

I also declare that there is, to my knowledge, no information in my possession that reasonably has or may have the potential of influencing –

- any decision to be taken with respect to the application in terms of the Act and its regulations; or
- the objectivity of this report, plan or document prepared in terms of the Act and its regulations.



Stephanie van Zyl
Environmental Assessment Practitioner (EAP)

EXECUTIVE SUMMARY

INTRODUCTION

NamPower intends constructing a 461 km long 400kV transmission line from the Auas Substation near Dordabis to Kokerboom substation near Keetmanshop, Namibia, as shown on the map overleaf. The line will assist in securing the supply of electricity to Namibia in future and open up opportunities for selling power to the Southern African Power Pool (SAPP).

NamPower is currently applying to the World Bank for funding of the project, which will entail the following:

- The new Auas-Kokerboom 400kV Transmission Line, with associated infrastructure at both substations such as switchgear and reactors.
- A Battery Energy Storage System (BESS) to be installed at Lithop Substation, that will enable NamPower to store energy generated by, amongst other, renewable sources such as solar or wind energy to allow utilisation of such energy when these resources are not available, such as after sunset.

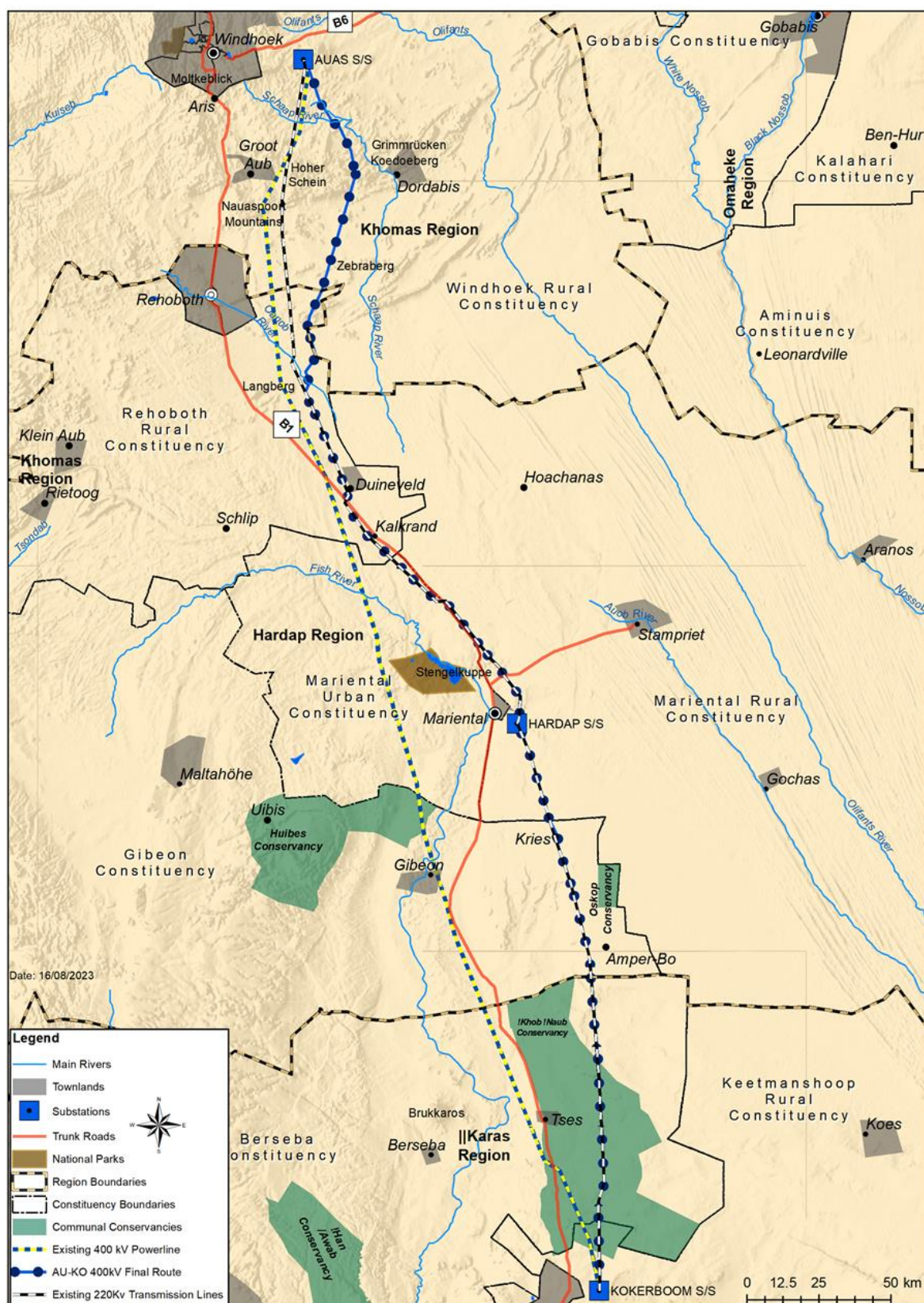
An Environmental Impact Assessment for this project was completed in 2020 and an Environmental Clearance Certificate obtained for it in terms of Namibia's Environmental Management Act, in 2021. The World Bank's Environmental and Social Framework, consisting of ten Standards should be adhered to as a condition for the loan.

Environ Dynamics was appointed to update the 2020 ESIA and ESMP, to meet all the above Standards where gaps are identified. This ESIA Report, together with the Appendices contains the findings of this work, including the required Management Plans necessary to implement satisfactory mitigation during construction and operation.

PROJECT DESCRIPTION

This Environmental and Social Impact Assessment (ESIA) was prepared for the proposed construction of a single-circuit 400 kV transmission power line from the Auas substation (near Dordabis) to the Kokerboom Substation (near Keetmanshoop) (hereafter refer to as the "Project"). The length of the transmission line is approximately 460 km. The transmission power line will have a final servitude of 80 m width, with 12 m of that being cleared for an access track.

The preferred transmission line route follows the existing 220 kV transmission corridor from the Kokerboom substation in the south for a distance of approximately 165km, after which it deviates to the east; to largely avoid homesteads, infrastructure and major topographic features; and passes through the Nauaspoort Mountain towards the Auas substation located in the north near Dordabis/Windhoek.



Locality map of the Awas-Kokerboom 400kV Line Route

The tower designs along the majority of the route will consist of cross rope suspension towers (V-Structures), with self-supporting and strain towers in strategic points. The construction period will be approximately thirty-six months and it is likely to proceed on multiple construction fronts. Existing access roads will be utilized as far as reasonably possible to access the construction corridor.

As shown in the diagram below, two alternative routes were considered namely, the western route which largely follows the existing 400kV transmission line and the eastern route (preferred option), which largely follows the existing 220kV transmission line. A comparative analysis was done between these two route options. It was concluded that the potential impacts on the western route will be marginally smaller, with ~3%, because of its slightly shorter distance. However, the western route is considered technically unfeasible due to the route crossing the existing 200kV line, which will need the installation of a tower to ensure safe clearance. The close proximity of the two 400kV lines also increases the risk of a failure (power outages) of both lines, which is of national significance.

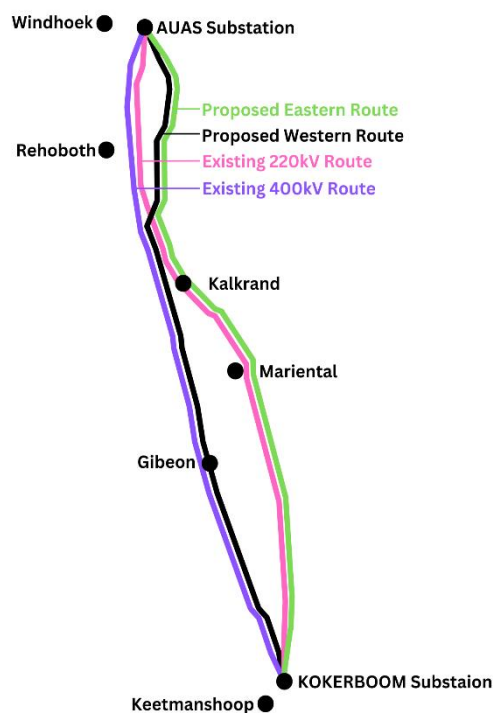


Diagram illustrating western and eastern alternative routes

MAIN IMPACT RISKS AND PROPOSED MITIGATIONS

Critical Habitat

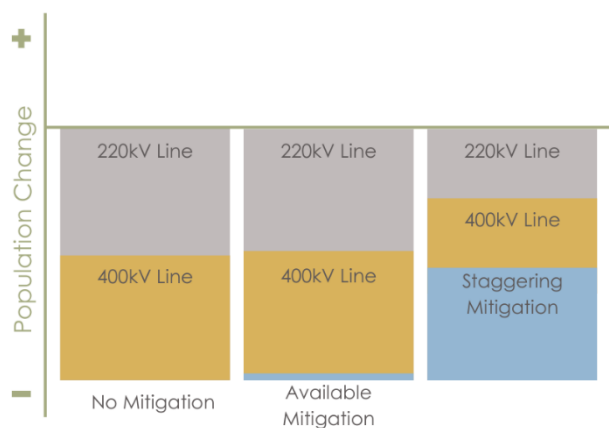
It is concluded from the Critical Habitat Assessment, that given all the ESS6 criteria combined, the Karas Dwarf Shrubland and Dwarf Shrub Savanna which cover the study area to the south are considered critical habitat for the **Ludwig's Bustard**. The **Ludwig's Bustard**, which is classified as Globally Endangered, according to the IUCN Red Data list of species and listed as Endangered on the Namibian Red List, prefers open grassland found in the mentioned habitats. Within these habitats, the Hardap Dam is also an Important Bird Area and an important site for the migratory species Great White Pelican. Even though the dam is some 10km to the west of the proposed route, birds flying to and from this site can potentially collide with the power line.

Despite the fact that these habitats are considered important areas for Ludwig's Bustard and other species of conservation concern, it is the presence of the power line as a physical barrier, which poses the threat in terms of potential collisions, and needs to be addressed intentionally.

Biodiversity Risk Management (or mitigation) measures following a mitigation hierarchy approach have been considered in the Critical Habitat Assessment. The goals of No Net Loss and Net Gain should be set in the Biodiversity Management Plan.

A staggered design (i.e., the "staggering" or offsetting of pylons of the new 400 kV line with those of the adjacent 220 kV line) is being proposed, to increase the visibility of the obstruction of the power line infrastructure to flying birds, and thus reduce the chances of collisions. Since regional monitoring shows that current available mitigation, i.e., marking of lines to make them more visible, is ineffective for Bustards, the staggering mitigation is considered a potential solution and as such it is anticipated that the number of bird deaths at a regional scale can be significantly reduced. The staggering mitigation proposal is based on data which shows that most collisions take place mid-span between pylons, indicating that the pylons could be an effective visual barrier.

The diagram below indicates the risk of the alternative mitigation methods. The existing 220kV line is not mitigation, and should another transmission line be added, the bustard collisions will effectively double. Should available mitigation be applied, there is expected to be a very small change to curb the bustard collision risk. The staggering mitigation option, however, is expected to reduce collisions on both lines, with approximately 45%. Not only will this be a major advance for the bustard population's future on this project, but also as a potential future mitigation option on projects in the region with similar risks.



Bustard collision mitigation options compared.

Though the confidence in the proposed staggering is high, the approach has not yet been proven, and will be applied as a trial to determine the effectiveness of staggering transmission lines to reduce bird collisions. It is proposed that, prior to construction, further studies, in addition to consultations with avifauna specialists, be conducted to refine this approach as a mitigation measure as part of the finalization of the design. This preparation period will also be used to refine the power line marking methods to be used for specific avifauna hotspots, and as preparation of a robust monitoring plan in the BMP. A plan of study is being proposed to set the terms for this further work prior to construction.

The BMP will set out a short (pre-construction), medium (during construction) and long term (post-construction) monitoring programme. The BMP will in particular focus on the monitoring of key critical habitat areas, to assess the effectiveness of the mitigation measures that have been proposed thus far (staggering and line markers), with an aim to achieve Net Gain. A further aim of the monitoring is to assess local population numbers and trends of sensitive bird species (especially bustards) that are using these key critical habitat areas.

The BMP will contain the requirements for further, ongoing biodiversity monitoring during the operational phase, to evaluate how effectively the mitigation measures proposed are in achieving the Net Gain targets.

Impact assessment

The impact assessment carried out revealed the following significant effects:

- **Impact on vegetation:** Because of the linear nature of the project, the impact on vegetation is expected to be generally low. The loss of protected tree species, specifically the protected Camel Thorn rates medium and can be reduced to achieve a low significance with on-sit final route selection and

proper vegetation management. Appropriate mitigation is included in the Biodiversity Management Plan (BMP).

- **Impact on avifauna:** The project area supports a relatively high diversity of red data species, including Vultures, Eagles, and Bustards that are particularly vulnerable to power line collisions. The main impact on birds will be bird strikes once the line is operational. The route has been aligned along an existing 220kV transmission line to minimise cumulative impacts. However, there still remain habitats that harbour sensitive red data bird species. Mitigation measures, which are a non-negotiable condition should be implemented, namely staggering the 220kV with the 400kV pylons (to be the same height to increase the chance of bustards seeing and clearing both lines), and where this staggering is not possible or ineffective after a period of monitoring, the line be marked with bird diverters. Bird marking is recommended for specific hotspot areas, where this type of mitigation is expected to be effective. A rigorous monitoring programme, is proposed, as discussed for Critical Habitat.
- **Social impacts:** The most significant impacts include disruption to farm management and changed sense of place. For some farmers the key impact will be during construction when the team interferes with and could potentially introduce nuisances on their farms such as noise, dust, security risk, poaching, etc. to their land. This impact will continue periodically during operation when maintenance is carried out on the line. Some owners are concerned who already have a number of lines crossing their land. For some who place a high value on view sheds, their sense of place will change. These impacts are low generally for the entire route, but rated high to medium for some receptors.

NamPower has made significant efforts to accommodate farm owners concerns in this regard, by making route adjustments where possible. Mitigation of potential nuisance and conflict on farms during construction and operation includes a well-planned management and communication protocol. There will be no resettlement or land take on this project. Land restrictions include that no structures be erected within the project servitude. Farms are generally large and used for grazing under the transmission line corridors. Grazing may continue without interruption. NamPower's efforts to compensate for the land restrictions are considered reasonable and do satisfy the World Bank's Environmental and Social Standard: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

The limited land use restrictions are expected to have a low impact on the Nama Traditional Local Community, considered an Indigenous People group according to the World Bank ESS7. Engagement with the group's representatives, including those of the !Hob! Naub Conservancy, confirmed

this assessment. The conservancy is large, none of their settlements or structures will be affected and livelihood strategies will continue mostly unaffected. Continued engagement with this group is very important and recommendations have been made to limit impact on the community during construction. A recommendation is also made to include a social upliftment programme targeting the Nama community, into the project implementation.

- **Impact on archaeology:** Three sensitive sites have been discovered along the route, including one burial cairn, a grave (both in the south near Keetmanshoop) and a graveyard (on one of the commercial farms along the northern section of the route). These are not directly on the route (, i.e., between 2-4km away from the servitude boundary), but may be implicated during construction and operational activities in the area, particularly vehicles driving on the access track. The sites should either be marked and protected, or if this is not possible, removed completely before construction commences. The impact on these sites is rated high and the careful consideration of how to protect them is crucial.

Other impacts, including impacts on labour, impacts related to waste, and community health and safety issues, have been assessed and should be addressed as part of the ESMP and the directives in the World Bank ESS.

Cumulative Impact Assessment

The cumulative impacts of the existing 220kV transmission line combined with the additional proposed 400kV transmission line were considered at a preliminary level. Impacts on the following Valued Environmental and Social Components (elements that are of value in the area), were assessed:

- Health of vegetation, particularly *Vachellia erioloba*. The cumulative impact is expected to be low. The final survey of the power line should attempt to avoid these species as far as possible, and trees should be trimmed rather than removed where feasible.
- *Health of bird populations particularly those susceptible to power line collisions especially Ludwig's Bustard and Kori Bustard.* This impact is significant and a key focus of this study. By staggering the pylons, the impact is probably significantly reduced on both lines, resulting in possible Net gain. Bird markings and monitoring is also crucial to mitigate the impact, as prescribed in the Biodiversity Management Plan.
- Visual quality as a tourism resource. Because of the increasing number of transmission lines, especially close to tourism related activities existing or planned, this impact is a concern. Rerouting has been done on the applicable farms where possible.
- *Social conditions on farms (specifically power line construction workers and maintenance teams)* will likely be impacted. Farm owners have had to deal

with the related frustrations in the past, and this project will likely add to these frustrations. Maintenance teams accessing the farms to work on the multiple lines adds to this social concern. Protocols for interactions on the farms have been included in the ESMP. The grievance redress mechanism provided for this project is crucial in terms of dealing with conflict and management of maintenance teams on the farms.

RECOMMENDATIONS

In light of what can be concluded regarding the potential impacts associated with the proposed transmission line, NamPower will be able to reduce the significance of most of these to acceptable levels if they implement the mitigation measures outlined in both the Construction and Operational ESMP. The BMP, SEP and LMP also need to be implemented. The preliminary BMP that was previously prepared as part of the ESMP will be updated according to the Plan of Study, contained in the biodiversity and critical habitat assessment, to refine biodiversity mitigation and monitoring, particularly as it relates to avifauna impacts and monitoring. It is important that the ESMP is audited to ensure compliance and that monitoring takes place as outlined therein otherwise the impacts identified will remain unacceptable.

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DRAFT BIODIVERSITY AND CRITICAL HABITAT ASSESSMENT REPORT
ARCHAEOLOGICAL ASSESSMENT
VEGETATION ASSESSMENT
FLOODLINE ASSESSMENT
SOCIAL IMPACT ASSESSMENT

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DRAFT ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

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ABBREVIATIONS

AD	Anno Domini/ In the year of our Lord
AIDS	Acquired Immunodeficiency Syndrome
ARAP	Abbreviated Resettlement Action Plan
BID	Background Information Document
BMP	Biodiversity Management Plan
CHA	Critical Habitat Assessment
CHAA	Critical Habitat Area of Analysis
CIA	Cumulative Impact Assessment
ECB	Electricity Control Board
ECC	Environmental Clearance Certificate
EIA	Environmental Impact Assessment
EMF	Electromagnetic Field
EMP	Environmental Management Plan
ESCP	Environmental and Social Commitment Plan
ESIA	Environmental and Social Impact Assessment
ESF	Environmental and Social Framework
ESS	Environmental and Social Standards
ESMP	Environmental and Social Management Plan
GIS	Geographic Information System
GN	Government Notice
HIV	Human Immunodeficiency Virus
I&AP	Interested and Affected Party
IBA	Important Bird Area
ICNIRP	International Commission for Non-ionizing Radiation Protection
ILO	International Labor Organization
NHC	National Heritage Council
SAPP	Southern African Power Pool
SHEW	Safety, Health, Environment and Wellness
SS	Substation
ToR	Terms of Reference
TX	Transmission
km	kilometer
LMP	Labor Management Plan
m	meter
m ³	Cubic meter
VECs	Valuable Environmental and Social Components

1 INTRODUCTION

1.1 BACKGROUND

NamPower proposes to construct a single-circuit 400 kV transmission power line (hereafter referred to as the Project) from the Auas substation (near Dordabis) to the Kokerboom Substation (near Keetmanshoop), a distance of approximately 460 km (**Figure 1-1**).

There are two existing transmission lines (400kV and 220kV) connecting the Kokerboom and Auas Substations. The existing 400 kV and a 220 kV transmission power line, located between the two substations have been operational for the past 17 and 37 years, respectively. This infrastructure alone is considered inadequate to meet the future demand needs of the country and therefore NamPower is proposing the construction of an additional 400kV transmission line to strengthen the transmission network

Lithon Project Consultants and Enviro Dynamics conducted the environmental assessment process on behalf of NamPower in 2019-2020, for this project to satisfy the requirements of the Environmental Management Act (2007) and its Regulations (2012). An Environmental Clearance Certificate (ECC) was subsequently obtained from the Ministry of Environmental, Forestry and Tourism, in 2021, for the implementation of the Project (**Appendix A**).

NamPower intends to implement the Project and has approached the World Bank to fund it. Part of the funding requirements of the World Bank include a set of Environmental and Social Standards (ESS), according to their Environmental and Social Framework (ESF). This report, the Environmental and Social Impact Assessment Report (ESIA), has been updated to satisfy the requirements of the ESS.

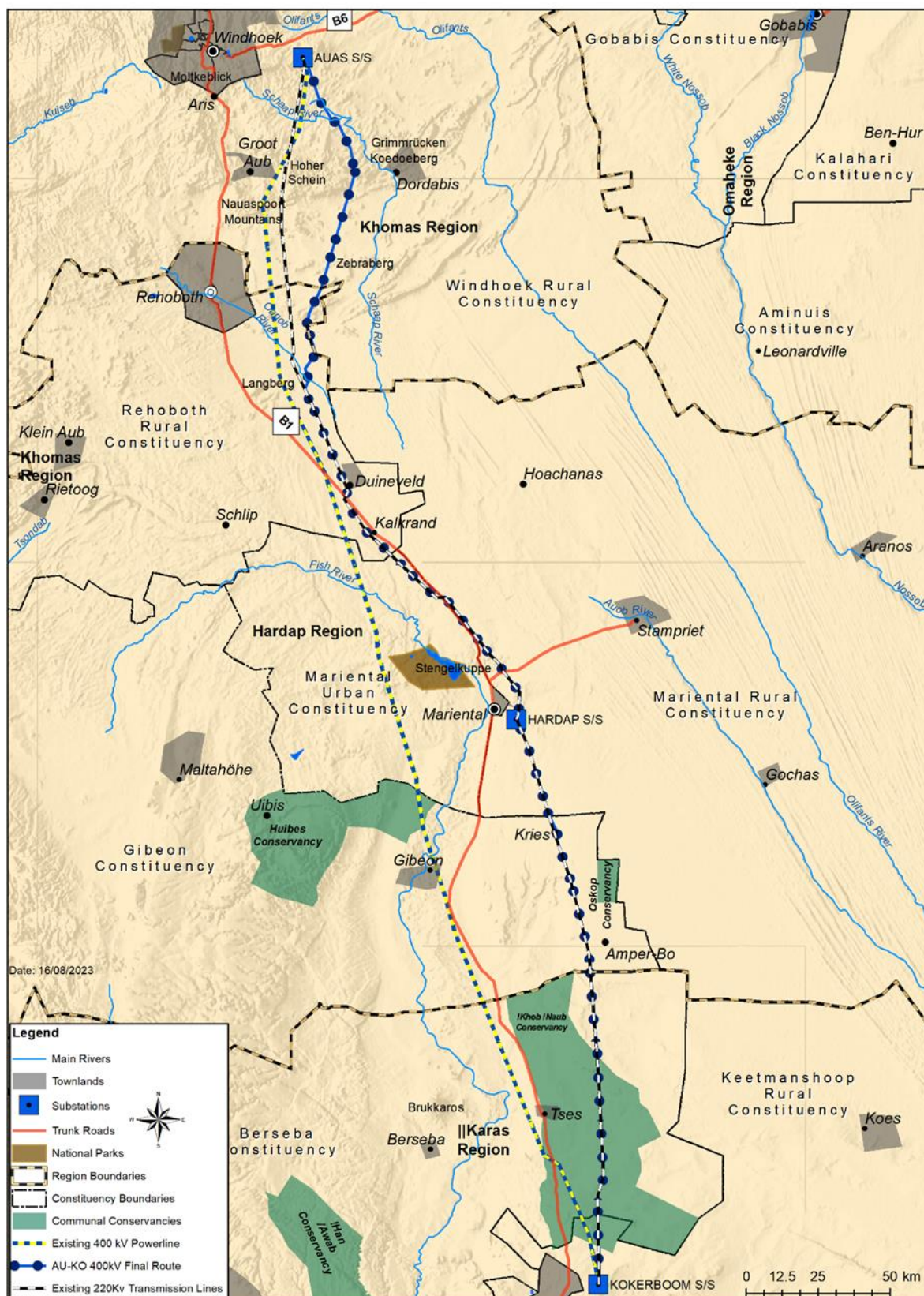


Figure 1-1: Locality Map of the proposed Auas-Kokerboom 400kV Transmission Line

1.2 HISTORICAL AND CURRENT WORK PLAN

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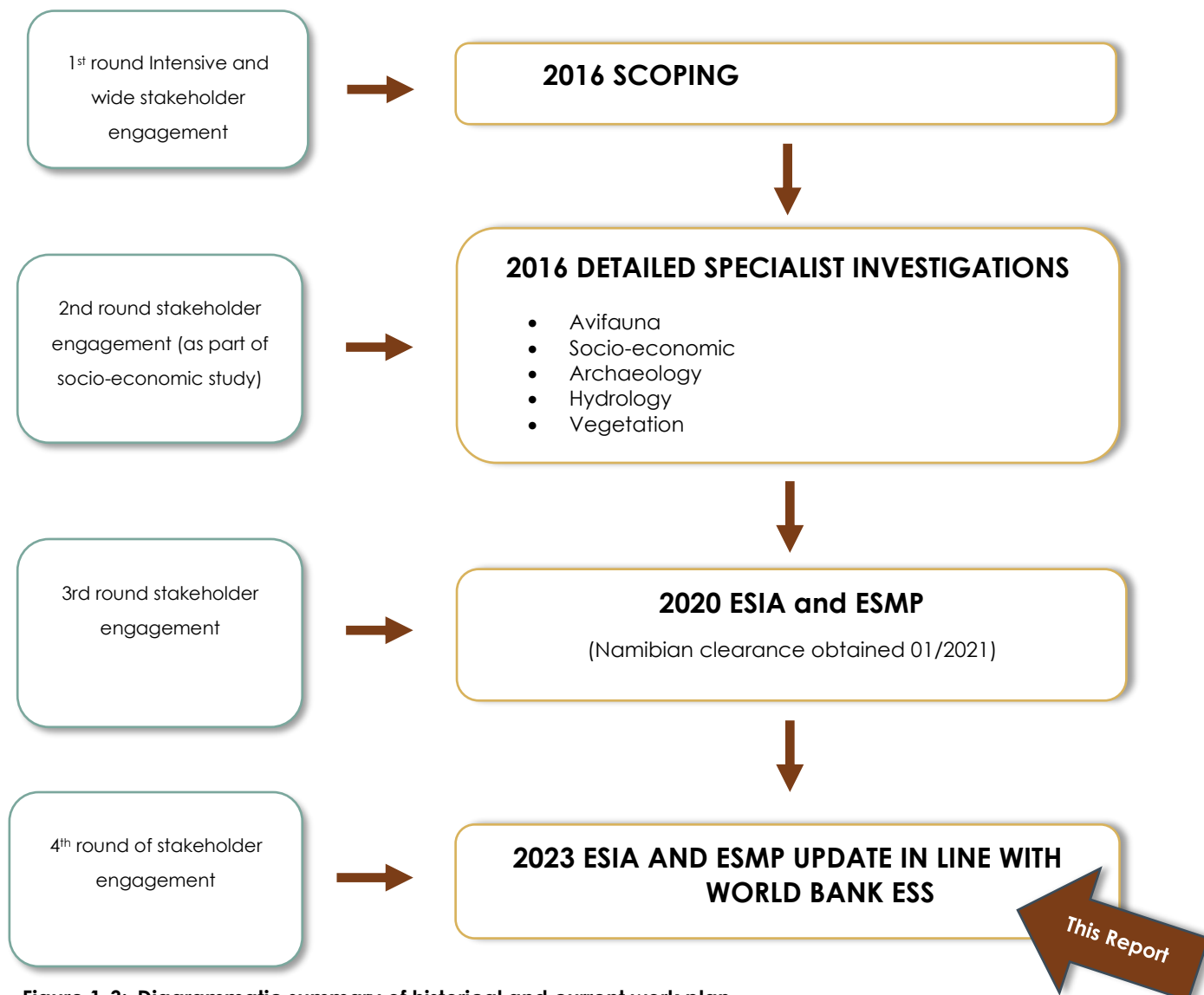


Figure 1-3: Diagrammatic summary of historical and current work plan

1.3 THE STUDY TEAM

1.3.1 EIA for submission to the Ministry of Environment, Forestry and Tourism

EAP: Jana Ball of Lithon Project Consultants for the scoping study and managing the specialist studies.

Stephanie van Zyl of Enviro Dynamics (ED), appointed by Lithon Project Consultants for Compiling the Environmental Impact Report, conducting a review on the Bird Impact Assessment and circulating and submitting the work.

The Specialists on the team were as follows:

- Avifaunal Assessment – Dr. CJ Brown of Sustainable Solutions Trust, Dr Rob Simmons, Ornithologist, Dr Ann and Mike Scott of African Conservation Services (Independent Review)
- Vegetation (Botanical) Assessment – Ms Coleen Mannheimer
- Drainage Assessment – Mr. Chris Muir
- Social Impact Assessment – Mrs. Kerry McKune-Desai
- Archaeology Assessment – Prof. John Kinahan of Quaternary Research Services

1.3.2 Current update of ESIA for compliance to ESS

Stephanie van Zyl (ED Environmental and Social Assessment Expert	Update of ESIA, update Social Impact Assessment and ESS7 and ESS 7 Assessments, Stakeholder Engagement Plan
Norman van Zyl (ED) Environmental and Social Assessment Expert	Stakeholder Engagement Update ESMP
Coleen Mannheimer	Critical Habitat Assessment in terms of ESS6 on Vegetation and Vegetation contribution to Biodiversity Management Plan
Dr. Ann and Mike Scott (African Conservation Services)	Avifauna Critical Habitat Assessment in terms of ESS6 and Avifauna contribution to Biodiversity Management Plan
Benjamin Begbie Clench, Indigenous Peoples Expert	Indigenous Peoples Chapter

2 PROJECT DESCRIPTION

The need for the proposed new transmission line and an evaluation of route alternatives are provided in this chapter as well as the technical specifications of the infrastructure to be constructed. This chapter highlights aspects of this project, which are likely to interact significantly with the socio-ecologic environment.

2.1 NEED FOR THE DEVELOPMENT

The NamPower generation mix is focussed on green energy and includes the planning of • 20MW Solar PV • 40MW modular and scalable Wind energy in the Lüderitz area • 40MW Biomass plant • and 50MW firm supply option.

One of NamPower's Strategic pillars is security of supply, according to its Strategic Plan for 2023 ((NamPower , 2019). To achieve this, the transmission network needs to be strengthened. NamPower will focus on increasing the resilience of its Namibian power grid to incorporate power from new market participants. NamPower will leverage its transmission coverage of the country in exploring and developing new opportunities and revenue streams in Namibia and the SAPP region. Multiple line strengthening projects are planned, the largest of which include the Auas-Gerus 400kV line, the Obib to South Africa (Oranjemond) 400kV line, and the subject of this study, the Auas-Kokerboom 2nd 400kV line. These projects will provide the following benefits to Namibia's national power grid:

- Improved network reliability
- Increased capacity to supply load
- Increased capacity to wheel and generate additional income from wheeling
- Increased utilisation of the High Voltage Direct Current (HVDC) link
- Improved dynamic stability
- Provision of savings in transmission line losses
- Incorporation of power generated from new market participants, particularly intermittent renewable energy projects

The existing power line network within the Project Area is shown in **Figure 2-1** below.

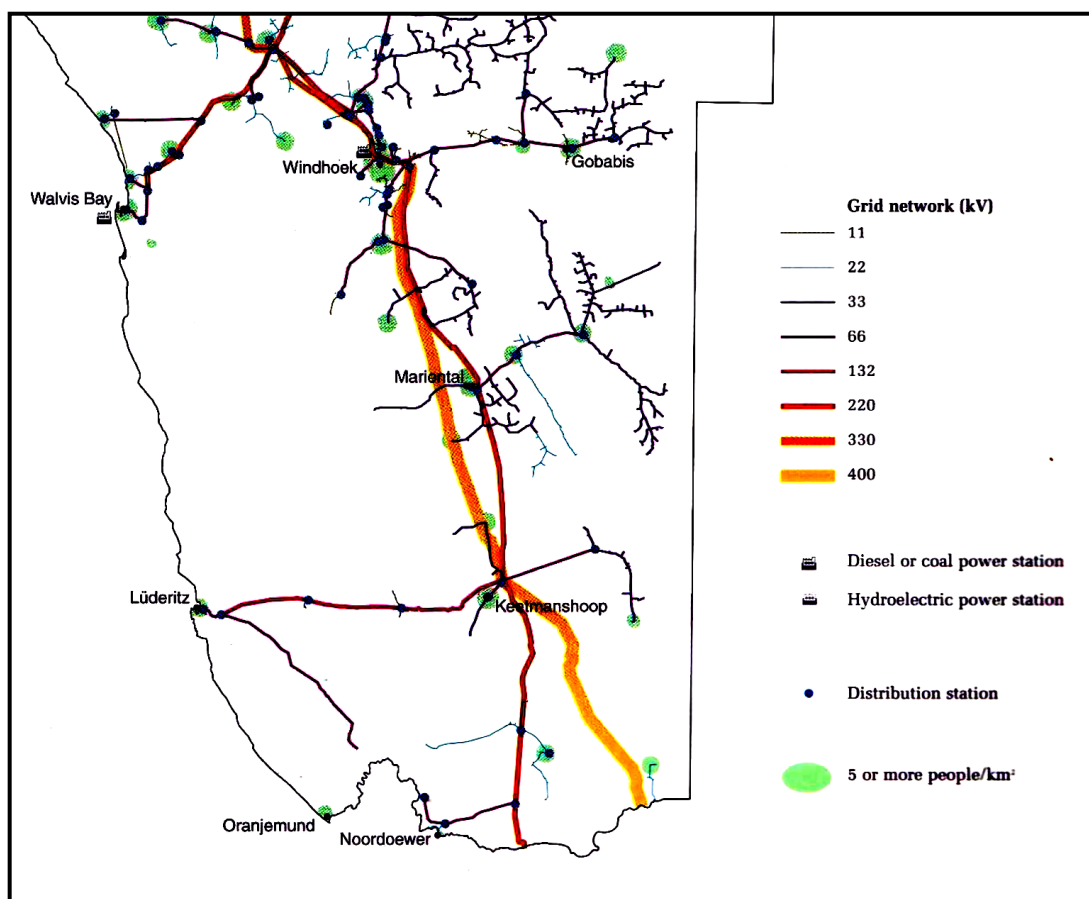


Figure 2-1: Existing transmission line network of Namibia (Source: NamPower, 2019).

The purpose of the construction of the new 400kV Aucas to Kokerboom transmission line is to strengthen the overall transmission network in Namibia. Without upgrades to the transmission line network future electricity supply in Namibia will become constrained, and as a result, restrict development (mining, industrial and residential) and negatively impact quality of life in the country as a whole.

Therefore, construction of the proposed transmission power line will not only be of benefit to the Namibian electricity transmission backbone, but to Namibian economy. It does not serve only the specific area where the transmission power line is to be constructed.

The expected Namibian electricity load growth together with possible transfer of power northwards, via the Zambezi Link Interconnector High Voltage DC (HVDC) scheme, requires the proposed transmission line to be operational. Also, the number of cases where an outage of the existing 400kV line can be accommodated (hence relying only on the 220 kV interconnector from South Africa) is declining each year as the Namibian electricity load grows.

The option of not constructing the current proposed transmission line, will therefore have the following implications:

- Increased power outages on the existing 400kV and 220kV transmission line and resulting interruptions and economic losses for the Country.
- Loss of opportunity to export power to countries North of Namibia
- Lack of power supply to the Kudu Power Project, should it realise in future.
- No carrier to harness the power supply from intermittent renewable power projects currently underway and being planned.

2.2 TRANSMISSION LINE

The proposed transmission line is a single-circuit 400 kV transmission power line, consisting of three phases of four each, a tern conductor, with one optical fibre ground wire and one earth wire. The estimated length of the transmission line is 461 km.

The servitude, shown in **Figure 2-2**, will be 80 m wide (40m each side of the centre line) for the entire line. A service road of approximately 12 m width will be cleared of vegetation and obstacles, within the allocated 80m wide servitude. The access road will be utilised during construction, as well as during the maintenance phase throughout the 30 years lifespan of the transmission line.

Since the line will run parallel to the existing 220Kv power line; to the south; the combined servitude width of the existing and new line will be 111m in total. The 111m servitude consists of a minimum distance of 46m between the two lines, and a 40m servitude outside the centre line of the 400kV line, and 25m outside the centre line of the existing 220kV line.

The area from the centre of each tower structure to be cleared of vegetation, will be approximately 70 m X 50 m. However, the ESIA assessed a corridor of 500 m wide (250 m on either side of the proposed line) and a 10km (5km on either side of the proposed line) for the bird and critical habitat assessment.

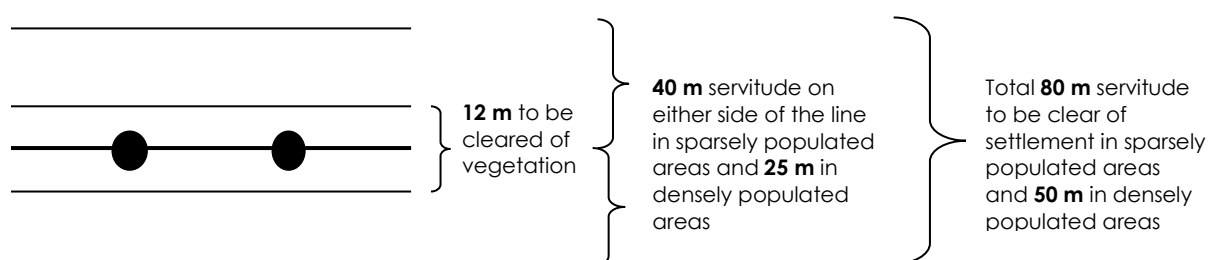


Figure 2-2: Servitude details for the proposed transmission line

For safety and technical reasons, no permanent structures other than the towers are allowed within the servitude. Grazing and cultivation of fields with associated farming activities may be accommodated within this area, except for the 12 m strip, which is needed during construction.

The steel pylons proposed are the cross-rope suspension tower for the majority of the line, with strain tower or the self-supporting suspension (open-V) tower in strategic locations. **Table 2-1** below summarizes the three types of towers to be used.

The cross-rope suspension tower is very basic but has a larger footprint: less steelwork and only two major concrete foundations are required in addition to minor concrete foundations for the cross ropes, while the self-supporting and the strain towers are more complex and have a lesser footprint, but require more steelwork and have four major concrete foundations.

Table 2-1: Summary of tower structures to be used

Tower type	Scope	Complexity (Steelwork)	Construction effort	Cost	Footprint
Strain tower	Used at turning points of up to 60 degrees.	High	High	High Slightly more than double the self-supporting suspension tower	Less
Self-supporting suspension tower	Used at turning points: 0 to 30 degrees, Used, together with other types of towers, where there are servitude constraints.	Medium	Medium	Medium Slightly more than double the cross-rope suspension tower	Less
Cross rope suspension tower (guyed V-Structure) Height 40m Span length 500m	Used at all straight sections of the transmission line where servitude constraint is not an issue.	Low	Low	Low	Large

Figure 2-3 below shows these structures visually.

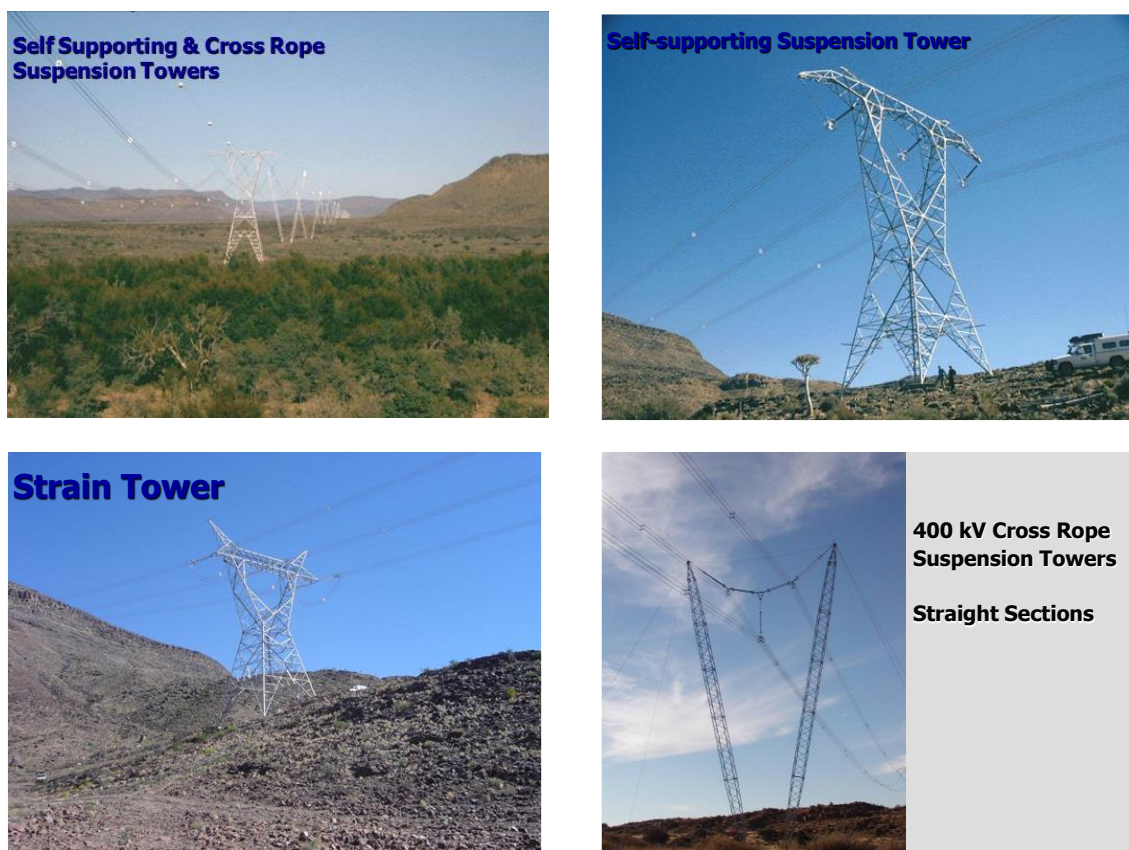


Figure 2-3: Structures to be used on the power line.

2.3 THE PROPOSED SUBSTATION CHANGES

There are no new substations required for this proposed power line, although minor works will be required within the existing Auas and Kokerboom substations to accommodate the connection of the new line.

At the Kokerboom substation, a new busbar extension (used to transmit high current power from source to load), line feeder bay, reactor bay and reactor (used to stabilise the voltage during load variations) will be installed. At the Auas substation, a new reactor installation is required.

Four new fibre regeneration stations will need to be constructed. These stations are normally contained within the footprint of one of the towers and are fully fenced off with a gate.

The anticipated small works to connect the new transmission line into the existing substations is not foreseen to have any significant environmental or social impacts and can therefore be mitigated and managed through the measures contained in the Environmental and Social Management Plan. The minor works are therefore not discussed further in this document.

2.4 CONSTRUCTION ACTIVITIES

All the components for power line construction (concrete, pylons, conductors, and insulators etc.) will be transported to site by road on low-bed trailers. The main access road to the line is the B1 and is likely to be used to transport materials to and from the transmission line. In the northern section of the route, district roads will be used to access the line. From here materials will be transported along the allocated servitude, via the existing single track gravel road servicing the existing transmission line.

Steel structures (towers) will be erected either by using a crane to place the pre-assembled tower onto the concrete foundation or by assembling the tower from its concrete foundation section by section. The conductors will be strung using heavy-duty mechanical winches.

Concrete for the pylon foundations will be mixed and poured on site or at a batching plant in close proximity. Hence, all the concrete constituents (crushed stone, cement, water and sand) will be transported to the project area.

Most often, construction camps accommodating construction labour force are located close to the work area. At this stage it is anticipated that two based camps and an estimated five satellite camps (one approximately every 40 km along the line) due the distance may be required. The locations of the construction camps are not known at this stage and will be the contractor responsibility of the contractor. Identification of suitable locations will be done in consultation with the NamPower Project Manager and SHEW department, prior to commencing with construction (site establishment).

2.5 CONSTRUCTION MATERIALS AND PROCESS

The following estimated quantities of materials will be required for the construction of the transmission line:

- 6 m³ water from boreholes for concrete batching, per km (see Section 2.7 with regard to the water demand for the project). The total amount of water for construction purposes is estimated as 2766 m³ however the water demands will be spread over the distance of the transmission line.
- 50 m³ sand and stone for concrete, sourced from local licensed suppliers, per km. The total amount of aggregates is estimated as (23 050 m³).
- 12 tons galvanised steel (tower structures), per km, sourced internationally. The total amount of galvanised steel is estimated as 5532 tons.
- Conductor, Optical fibre, Insulators and associated hardware will be sourced internationally.

It is anticipated that the bulk materials will be stored within the two based camps, and possibly five satellite camps from where the materials will be transported to site

on a daily basis. The construction activities will be undertaken in sequence using three separate teams, responsible for:

- Clearing the line, digging and casting of foundations;
- Constructing towers (specially trained team); and
- Stringing and clamping the cabling (specially trained team).

2.6 WASTE MATERIALS

It is anticipated that the construction activities will generate, small quantities of concrete waste, and other residual building materials, while general domestic waste such as plastic bags, tins, bottles, paper, and packaging will be generated at the construction base and satellite camps. Due to the distances of works areas, from nearby town/ waste facilities, waste generation will need to be managed in an appropriate manner in order to minimise the project's ecological footprint. General waste disposal facilities operated by the applicable local authorities, are currently available at Keetmanshoop, Mariental, and Windhoek. There is a hazardous waste disposal facility at Windhoek. There is one major private recycling company operating from Windhoek.

2.7 PROJECT WATER DEMAND

The estimated water demand for the construction process is 5060 m³ in total over the 36 months of construction. The water demands can be broken down as follows:

For construction purposes:

- Estimated 950 towers, each requires 1.8 m³ of water for concrete foundations; therefore the overall concrete water demand is an estimated 1710 m³.

Water for the accommodation facilities and support is determined as follows:

- Approximately 20 ℓ per worker per day. It is anticipated that the project will require approximately 150 workers at peak. The water demand at the construction camps will therefore be 3 350 m³, or 670 m³ per construction camp over the construction period of 36 months.

At least fifty (50) commercial farms, in private ownership, have been identified along the servitude from which water could possibly be sourced.

Contractors may enter into agreements with farm owners, to utilise some of the borehole water for construction and domestic use. Water may also be obtained from the towns/villages where they are working, e.g., Windhoek, Dordabis, Mariental, and Keetmanshoop.

Should the Contractor obtain water from only the commercial farms, then the total demand from each farm owner would be approximately 100m³ over the total construction period per farm, which is 3.3m³/day or 0.14m³/h.

2.8 LABOR AND EMPLOYMENT OPPORTUNITIES

Employment opportunities on this project are limited. The construction of transmission lines is a specialised operation, which will be managed by a local or foreign contractor who will bring specialist foreign and Namibian staff from areas outside the project area.

The only activities for which the contractors most likely use local unskilled labour is for the debushing of the site (debushing will be done mostly with machines, but may be supplemented with manual labour) and for the digging of the foundations.

About 150 people will be employed during construction of a section of line, of which approximately 10 people will be of management and supervisory capacity. The remainder will be artisan and skilled labour, with a smaller component of unskilled labour.

The maintenance of the new transmission line is likely to be done by existing NamPower staff, therefore, no employment creation is expected during operation. If an agreement can be reached between NamPower and the local authorities, the maintenance of the cleared portion of the servitude could serve as an employment opportunity.

2.9 CONSTRUCTION CAMPS AND WORKFORCE ACCOMMODATION

There will be two base camps and approximately eight satellite camps distributed over the area. The based camps will store most of the materials and will be the administrative centres for the construction project. It is anticipated that there will be approximately 30 workers per satellite camp, however it is not anticipated that the satellite camps will be all occupied at one given time. Guidelines for camp establishment and workforce accommodation is included in the ESMP.

2.10 PROJECT COST AND TIMELINE

Cost estimates are approximately N\$ 2.8 million per km for the V-tower system. The total cost is therefore expected to be N\$ 1,2 billion. The estimated cost of the works at the substations is N\$ 600 million.

The construction period will be approximately 36 months or two to four years, depending on the construction programme favoured.

3 ROUTE AND TOWER ALTERNATIVES

3.1 ROUTE DESCRIPTION

Two route alternatives were considered during this study. The two proposed routes are presented in **Figure 3-1** below.

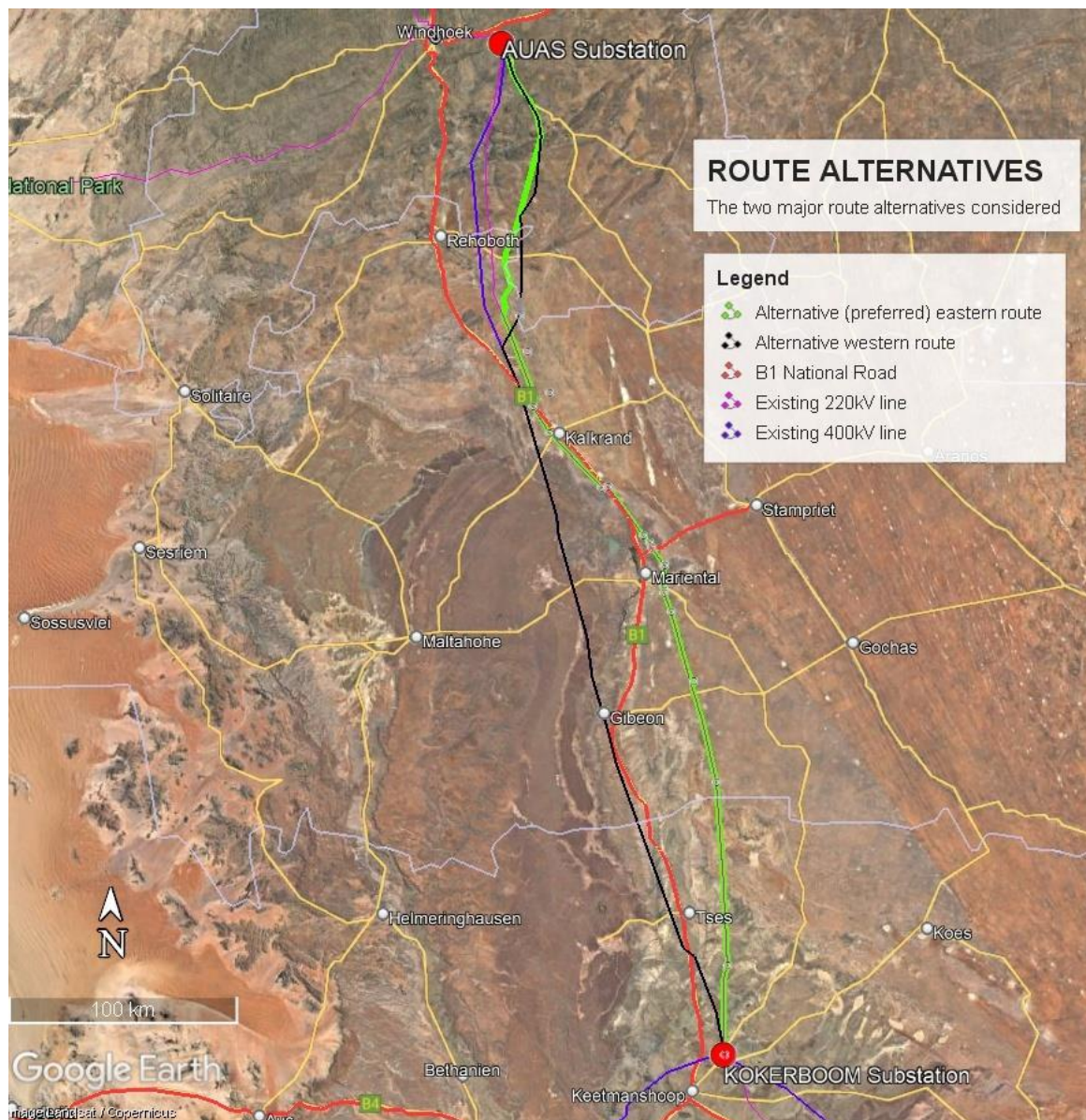


Figure 3-1: Locality map of the two major route alternatives considered.

The general direction of the route is from Auas substation near Dordabis to Kokerboom substation near Keetmanshoop. The overall aim is to keep the route short over this distance yet avoid major topographical limitations. Furthermore, the

aim is to place the route alongside existing infrastructure to avoid the breaking up of productive land, habitat and visual intrusion.

The two route alternatives considered to meet the above goals, are as follows.

Eastern alternative

The eastern alternative route starts at the Avas substation east of Windhoek, continuing due south. In this section it is not possible to follow existing transmission lines (the existing 220 and 400kV lines to the west), due to topographical constraints along their servitudes. Approximately 30km south of Rehoboth, the route meets up with the existing 220kV line and follows its servitude, passing Kalkrand, Mariental, Tses and ending at the Kokerboom substation, east of Keetmanshoop.

The eastern route, as originally provided by NamPower, was considered during an initial screening phase, as well as by the specialists during the scoping phase that was done as part of the Environmental impact assessment prepared to meet national requirements. The line was subsequently adapted by the team to avoid sensitive features such as dams, plans, topography, etc. This route ascribes to the criteria mentioned above and is a balance between avoiding land take and topographical features. In the northern part of the route, it deviates from the existing 220 kV line because of space limitations at the Nauaspoort Mountain range.

The western alternative

The western alternative follows a similar route as the eastern option along the northern portion, until it crosses the existing 220kV line approximately 30km south of Rehoboth. Here it joins the exiting 400kV line, following its servitude in a south-eastern direction. It passes Kalkrand, Gibeon, Tses, ending at the Kokerboom substation.

This western alternative was introduced as a possibility by the bird specialists in order to create a visual barrier for birds by spacing the new 400 kV line with the existing one and staggering the pylons. This set up could then be monitored to consider the effectiveness of it for avoiding bird collisions.

The planned 400kV transmission line runs through four vegetation types (vegetation habitats) that are relatively large in extent, ranging from 23,806-66,087 km² **Table 3-1**, as follows:

Table 3-1: Vegetation types and extent of power line for planned 400kV route (eastern) and alternative route (western) in each type

Vegetation type	Extent (in Namibia) (km ²)	Planned route (eastern, in km)	Alternative route (western in km)
Karas dwarf shrubland	66,087	204	144
Dwarf shrub savanna	65,794	141	183
Southern Kalahari	57,901	41	46
Highland shrubland	23,806	75	75
TOTAL		461	448

These vegetation types form the basis for the habitats affected, with associated birds and general biodiversity affected.

3.2 COMPARATIVE ANALYSIS

The alternative routes are compared below, from an avifauna, vegetation, topographical and socio-economic perspective.

3.2.1 Avifauna impacts

More details on this comparison may be found in the Critical Habitat Assessment, **Appendix F**. The indicative scoring conducted (**Table 3-2**) illustrates that the difference between the two routes, in terms of potential bird impacts, is very small. The original bird specialist preferred the western route because of perceived mitigation options being more extensive than on the eastern route, but all have subsequently agreed that staggering opportunities are equally possible on the western and eastern routes.

Table 3-2: Comparison Avifauna Impact ratings provided on a scale of 1-5, 1 being Low and 5 High

CRITERIA	ALTERNATIVE (WESTERN) ROUTE	PREFERRED (EASTERN) ROUTE
Distance of route that potentially affects birds	4	5
Area of habitat traversed that hosts conservation worthy species (Bustard habitat)	4	5
Traversing/close to hotspots (e.g., breeding sites)	4	4
Vicinity to IBA (Hardap Dam)	4	5
Vicinity to/crossing Fish River	4	1
TOTAL SCORE BEFORE MITIGATION	18	18
AVERAGE SCORE BEFORE MITIGATION	3.6	3.6
Possibility of mitigation (parallel to existing line, staggering potential, marking possibilities)	-10	-10
TOTAL WITH MITIGATION	10	10
AVERAGE WITH MITIGATION	2	2

3.2.2 Vegetation impacts

Table 3-3 compares major potential vegetation impacts on the two routes. As with avifauna, it is clear that the differences are barely discernible.

Table 3-3: Comparison Vegetation Impact ratings provided on a scale of 1-5, 1 being Low and 5 High

CRITERIA	ALTERNATIVE (WESTERN) ROUTE	PREFERRED (EASTERN) ROUTE
Length of line possibly impacting vegetation	3	4
<i>Vachellia erioloba</i> risk area traversed	4	4
TOTAL BEFORE MITIGATION	7	8
AVERAGE BEFORE MITIGATION	3.5	4
Possibility of mitigation (removing only necessary vegetation, vegetation management)	-6	-6
TOTAL WITH MITIGATION	1	2
AVERAGE WITH MITIGATION	0.5	1

3.2.3 Impacts resulting from topography

A third category used to compare potential impacts between the two route alternatives, is topography (**Table 3-4**). Steep or inaccessible topographic features traversed automatically result in high potential impacts. Construction efforts at these

sites are inevitably more difficult to navigate, which may cause comparatively more intense scarring to the landscape. Steeper terrain accessed, has a higher erosion risk in the project area's arid climate. This in turn degrades habitat and causes increased visual impact.

Table 3-4: Comparison of impacts caused by topographical features - ratings provided on a scale of 1-5, 1 being Low and 5 High

CRITERIA	ALTERNATIVE (WESTERN) ROUTE	PREFERRED (EASTERN) ROUTE
Topographically challenging terrain traversed	4	3
AVERAGE BEFORE MITIGATION	4	3
Possibility of mitigation (management of footprints)	-0.5	-0.5
TOTAL WITH MITIGATION	3.5	2.5
AVERAGE WITH MITIGATION	3.5	2.5

Topographically speaking, the most discernible area where difficult terrain is traversed is along the northern section of the route, where both alternatives are aligned. There are two mountain ranges traversed by the route in this section. The eastern route traverses an escarpment in the south, while the western route crosses the Fish River twice. The terrain of the western route is therefore slightly more rugged and inaccessible than the eastern route.

3.2.4 Socio-economic impacts

Table 3-5 considers the variations in socio-economic impacts between the two route options. Two criteria are provided, namely the length of the route affecting available land, and the number of commercial farms affected. It is the commercial farm owners who normally submit grievances or complaints about the lines crossing their land. In terms of commercial farms affected, there are 60 farms traversed along the western route, compared to 69 farms on the eastern route.

Table 3-5: Comparison of socio-economic impacts ratings provided on a scale of 1-5, 1 being Low and 5 High

CRITERIA	ALTERNATIVE (WESTERN) ROUTE	PREFERRED (EASTERN) ROUTE
Size (total length) of land affected	4	4.5
Commercial farms affected	4	4.5
AVERAGE BEFORE MITIGATION	4	4.5
Possibility of mitigation (grievance redress, management, compensation)	-1	-1
AVERAGE WITH MITIGATION	3	3.5

Due to the slightly longer length and higher number of commercial farms on the eastern route, the latter has a somewhat larger socio-economic impact compared to the western route.

3.2.5 Technical preference

Operational risks with regard to grouping 400kV lines

Significant operational risks are experienced with a geographical co-location of both 400kV lines, in that a catastrophic event will affect both lines simultaneously. Both the existing Avas-Kokerboom 400kV line and the new proposed line are designed for a transfer capacity of 600MW, thus the simultaneous loss of both lines will result in a potential loss of up to 1200MW. Although the probability of such an event is low, the consequences would constitute an extreme risk event, which would be expected to last several days. This would affect the Namibian economy on a large scale.

Alignment with the 220kV double-circuit line would reduce this risk significantly, due to the reduced transfer capacity of the 220kV lines. In the similar likelihood that a loss-of-service is experienced affecting both the 220kV double-circuit line and the new Avas-Kokerboom 400kV line, the available transfer capacity of the existing 400kV line will allow mitigation measures to be affected, thereby reducing the impact of such a loss.

Operational risks with regard to line crossings

The western alternative involves the new 400kV line crossing the existing 220kV line. There is no such crossing on the eastern alternative route. From an operational perspective, having high-voltage lines cross is not desirable, but often unavoidable. In cases where this is done, it is preferable to have the higher-voltage line cross over the lower voltages, in order to reduce the impact due to a conductor breakage. Such line crossings are seen as risk points in the line route, and it is preferred to locate

such line crossings close to substations, to allow for maintenance and risk mitigation with respect to such crossings.

Design & Construction challenges regarding crossing 220kV lines

The existing 220kV line utilizes structures with an average height of 34.5m, with earth wire and conductors located relatively high on the structure. The new proposed 400kV line will utilize towers with an average height of 37.5m. In order to achieve the required clearance, both spans will need to be reconfigured and constructed to achieve the required clearances in everyday conditions, as well as under windy conditions. This will result in a costly line crossing.

3.2.6 Conclusion alternative preference

Overall, the western and eastern alternative routes are similar in potential impact and mitigation opportunities from an avifauna perspective. The eastern route is slightly more advantageous from a vegetation and socio-economic perspective because it is 3% shorter than the western route, the latter which traverses more land. The eastern route is more advantageous than the western route from a topographical point of view mainly because it skirts the Fish River, which is a wetland, an attraction for power line sensitive avifauna and is topographically challenging terrain.

Since the overall socio-economic and bio-physical comparison between the two routes is very similar, the significant technical risks associated with the western route received precedence in the selection of the route. The eastern alternative has therefore been selected as the preferred option. The report therefore focusses on this option.

3.3 RATIONALE FOR TOWERS USED

The cross-rope suspension towers were selected for the straight sections of the route. Even though these towers have a larger footprint, they are significantly more costly than the self-supporting suspension towers and strain towers. The latter type towers are used as support structures at bends where additional strain is expected.

4 LEGISLATION AND POLICIES

The pursuit of sustainability is guided by a sound legislative and policy framework. This section provides a review of applicable and relevant legislation and policies, both international and national. This review serves to inform the developer of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled before the proposed project may commence. The findings of the above-mentioned review are summarised below.

4.1 LEGAL REQUIREMENTS IN TERMS OF NAMIBIAN LEGISLATION

The following list includes international and national legislation to be considered in terms of the Environmental Management Act (2007), which states that all relevant national legislation and international treaties to which Namibia is a signatory to, should be considered.

LEGISLATION/ POLICY/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
INTERNATIONAL		
Ramsar Convention on Wetlands of International Importance (1971)	<ul style="list-style-type: none"> Article 2(1) provides for the inclusion of wetlands in a "List of Wetlands of International Importance" "especially where these have importance as waterfowl habitat". Article 2(6) provides for the exercising of international responsibilities with respect to these wetlands. Article 4 provides for the promotion of conservation of wetlands and waterfowl. 	The Fish River system is not currently recognised as a Wetland of International Importance but is a crucial part of the ecosystem in the South of Namibia.
Convention on Biological Diversity (1992)	<p>Article 6 (b) provides for the explicit consideration of "the conservation and sustainable use of biological diversity into relevant... plans, programmes and policies"</p> <p>Affords protection of traditional cultural practices that are compatible with conservation and sustainable use, traditional knowledge and genetic resources.</p>	In keeping with national strategies, NamPower needs to ensure that biodiversity is not compromised as a result of this project.
African Charter on Human and Peoples' Rights (ACHPR), International Convention on the Elimination of all forms of Racial Discrimination (ICERD), International Covenant on Economic, Civil and Political Rights	General principles on human rights, non-discrimination, specifically, the rights of indigenous peoples, FPIC, women's access to employment, etc.	Consider how the rights of Indigenous peoples and women are protected and promoted on the project.

LEGISLATION/ POLICY/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
(ICCPR), Convention on the Elimination of all forms of Discrimination against Women (CEDAW)		
Convention on the Rights of the Child, African Charter on the Rights and Welfare of the Child, International Labor Organization (ILO), Protocol to the Convention against Transnational Organized Crime to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children.	<p>The ILO Conventions cover a wide area of social and labor issues including basic human rights, minimum wages, industrial relations, employment policy, social dialogue, social security and other issues. ILO Conventions concerning gender-specific issues have a long history.</p> <p>The other conventions listed deal with protection against child labor, trafficking, protection of rights of the vulnerable.</p>	Project specifications need to reflect these principles concerning labor, child and women's' rights in the workplace.
NATIONAL		
Namibian Constitution First Amendment Act 34 of 1998	<p>Chapter 3: Fundamental human rights and freedoms – guarantees equality and freedom from discrimination, rights to culture, language, and rendition.</p> <p>Chapter 11 Article 95: Promotion of the Welfare of the People</p> <p>Article 15-Children's rights</p> <p>Article 17-Political activity protecting the rights of indigenous Peoples</p> <p>Article 23 – prohibiting discrimination</p> <p>Article 66- upholds</p>	Ecological sustainability should inform and guide these projects. Principles with regards to the rights of children, women and vulnerable groups should be protected on the project.
Environmental Management Act EMA (No 7 of 2007)	<ul style="list-style-type: none"> Requires that projects with significant environmental impact are subject to an environmental assessment process (Section 27). Details principles which are to guide all EIAs. 	The EMA and its regulations should inform and guide this EIA process.
EIA Regulations GN No 28-30 (GG No 4878)	<ul style="list-style-type: none"> Details requirements for public consultation within a given environmental assessment process (GN No 30 S21). Details the requirements for what should be included in a Scoping Report (GN No 30 S8) an EIA report (GN No 30 S15). 	
Electricity Act 4 of 2007	<ul style="list-style-type: none"> The Electricity Control Board (ECB) with regards to achieving its objectives must make recommendations to the Minister regarding the issue and renewing of licences (S 3(2)(a)). A licence needs to be obtained from the ECB for the transmission of electricity (S 17(1)(c)). 	<ul style="list-style-type: none"> NamPower should adhere to the recommendations made by the ECB. NamPower requires a licence for the transmission of electricity. NamPower should adhere to any restoration or rehabilitation measures stipulated in the conditions of approval laid out by the ECB.

LEGISLATION/ POLICY/ GUIDELINE	RELEVANT PROVISIONS	IMPLICATIONS FOR THIS PROJECT
	<ul style="list-style-type: none"> The Minister or ECB may request that an EIA accompany applications for licences (S 21 (2) (a) (i)). Restoration of land and rehabilitation measures may be stipulated as a condition of a licence (S 24 (2) (b)). 	
Forestry Act 12 of 2001 Nature Conservation Ordinance 4 of 1975	<ul style="list-style-type: none"> Tree species and any vegetation within 100 m from a watercourse may not be removed without a permit (Forestry Act S22(1)). Prohibits the removal of and transport of various protected plant species. 	The clearing of vegetation is prohibited 100 m either side of a river. Certain tree species occurring in the area are protected under this Act and require a permit from the Directorate of Forestry for removal.
Labour Act 11 of 2007	Details requirements regarding minimum wage and working conditions (S39-47).	NamPower should ensure that all contractors involved in the construction of the services infrastructure for this project comply with the provisions of these legal instruments
Health and Safety Regulations GN 156/1997 (GG 1617)	Details various requirements regarding health and safety of labourers.	
Public Health Act 36 of 1919	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."	
National Heritage Act 27 of 2004	<ul style="list-style-type: none"> Section 46 prohibits the disturbance in any form of heritage resources declared as protected. Section 48 (1) states that "A person may apply to the [National Heritage] Council for a permit to carry out works or activities in relation to a protected place or protected object" 	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.
Burial Places Ordinance, 27 of 1966.	<ul style="list-style-type: none"> Governs burial places 	Permit required for their removal if disturbance is unavoidable. Governed by the National Heritage Council.

Relevant principles and regulations were incorporated into the EIA process completed in 2020, to satisfy Namibian requirements. The ECC was awarded in 2021. The relevant permitting requirements of these regulations are specified in the ESMP.

4.2 WORLD BANK REQUIREMENTS

4.2.1 Environmental and Social Framework

The majority of the Project will be funded by the World Bank and minor components will be funded by NamPower. Therefore, the Environmental and Social Framework (ESF) is applicable and to be applied. This section provides a summary of these requirements, and highlights gaps between them and Namibian requirements. Work required to fill the gaps is also listed.

The ten Environmental and Social Standards¹, are the following (**Table 4-1**):

¹ <https://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards>

Table 4-1: Summary of ESF of the World Bank and their applicability to the project

ESS No and Name	Objectives	Applicability to this project
ESS 1 Assessment and Management of Environmental and Social Risks and Impacts	<ul style="list-style-type: none"> To identify, evaluate, and manage the environment and social risks and impacts of the project in a manner consistent with the ESS To adopt a mitigation hierarchy approach to: (a) Anticipate and avoid risks and impacts; (b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; (c) Once risks and impacts have been minimized or reduced, mitigate; and (d) Where significant residual impacts remain, compensate for or offset them, where technically and financially feasible. To adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities resulting from the project. To utilize national environmental and social institutions, systems, laws, regulations, and procedures in the assessment, development, and implementation of projects, whenever appropriate. To promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity. 	<p>Yes, ESIA and ESMP completed to fulfil these objectives.</p> <p>Project Proponent to include an Environmental and Social Commitment Plan (ESCP) with their contract with the Bank.</p> <p>Gaps between national legislation and ESS requirements listed under each of the other Standards below.</p>
ESS 2 Labor and Working Conditions	<ul style="list-style-type: none"> To promote safety and health at work. To promote the fair treatment, non-discrimination and equal opportunity of project workers. To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS and migrant workers, contracted workers, community workers and primary supply workers, as appropriate. To prevent the use of all forms of forced labour and child labour. To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. 	<p>Yes. Ensure these standards are incorporated into the labour documentation and contracts.</p> <p>ESS 2, Section 9 states that "The Borrower will develop and implement written labour management procedures applicable to the project. These procedures will set out the way in which project workers will be managed, in accordance with the requirements of national law and this ESS. The procedures will address the way in which this ESS will apply to different categories of project workers including direct workers, and the way in which the Borrower will require third parties to manage their workers..."in accordance with ESS2.</p>

ESS No and Name	Objectives	Applicability to this project
	<ul style="list-style-type: none"> To provide project workers with accessible means to raise workplace concerns. 	These procedures need to be developed over and above the local legislation and have been included in the ESMP.
ESS 3 Resource Efficiency and Pollution Prevention and Management	<ul style="list-style-type: none"> To promote the sustainable use of resources, including energy, water and raw materials. To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities. To avoid or minimize project-related emissions of short and long-lived climate pollutants. To avoid or minimize generation of hazardous and non-hazardous waste. To minimize and manage the risks and impacts associated with pesticide use. 	<p>Yes. These principles are to be considered during the ESIA and ESMP.</p> <p>Namibian has limited regulations regarding pollution prevention and waste management.</p> <p>Specific guidelines are provided in the ESS 3 which will be included in the ESMP.</p>
ESS 4 Community Health and Safety	<ul style="list-style-type: none"> To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances. To promote quality and safety, and considerations relating to climate change, in the design and construction of infrastructure, including dams. To avoid or minimize community exposure to project-related traffic and road safety risks, diseases and hazardous materials. To have in place effective measures to address emergency events. To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities. 	<p>Yes. To check specific community health and safety impacts and include specific and general principles and measures in the ESMP.</p> <p>The ESS compares well to the Namibian Health and Safety Regulations, but specific will be considered during the ESIA and ESMP as appropriate.</p>
ESS 5 Land Acquisition, Restrictions on Land Use and	<ul style="list-style-type: none"> To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives. To avoid forced eviction. 	There will be no land acquisition involved. The land which forms part of the power line servitude will be restricted, i.e., no structures to be erected there. The land restriction imposed is being compensated. An audit has been done of the land restriction

ESS No and Name	Objectives	Applicability to this project
Involuntary Resettlement	<ul style="list-style-type: none"> To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher. To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure. To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant. To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected. 	procedures followed by NamPower, and recommendations made to supplement this work (see Land restriction policy, in ESMP).
ESS 6 Biodiversity Conservation and Sustainable Management of Living Natural Resources	<ul style="list-style-type: none"> To protect and conserve biodiversity and habitats. To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity. To promote the sustainable management of living natural resources. To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities. 	<p>Critical Habitat Assessment has been done in terms of avifauna and vegetation (Appendix F).</p> <p>According to ESS6, the Borrower “will also identify and assess potential project-related adverse impacts and apply the mitigation hierarchy so as to prevent or mitigate adverse impacts from projects that could compromise the integrity, conservation objectives or biodiversity importance of such an area.” The ESIA and ESMP as well as the Critical Habitat Assessment have covered these requirements.</p>
ESS 7 Indigenous Peoples/Sub-	<ul style="list-style-type: none"> To ensure that the development process fosters full respect for the human rights, dignity, aspirations, identity, culture, and 	Defined as “a distinct social and cultural group possessing the following characteristics in varying

ESS No and Name	Objectives	Applicability to this project
Saharan African Historically Underserved Traditional Local Communities	<p>natural resource-based livelihoods of Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities.</p> <ul style="list-style-type: none"> • To avoid adverse impacts of projects on Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, or when avoidance is not possible, to minimize, mitigate and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities in a manner that is accessible, culturally appropriate and inclusive. • To improve project design and promote local support by establishing and maintaining an ongoing relationship based on meaningful consultation with the Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities affected by a project throughout the project's life cycle. • To obtain the Free, Prior, and Informed Consent of affected Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities in the three circumstances described in the ESS. • To recognize, respect and preserve the culture, knowledge, and practices of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities, and to provide them with an opportunity to adapt to changing conditions in a manner and in a timeframe acceptable to them. 	<p>degrees: (a) Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; and (b) Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; and (c) Customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and (d) A distinct language or dialect, often different from the official language or languages of the country or region in which they reside."</p> <p>Consideration to ESS 7 is addressed in Section 6.</p>
ESS 8 Cultural Heritage	<p>ESS 8 covers tangible and intangible cultural heritage. Tangible cultural heritage is addressed in the local legislation. Intangible cultural heritage includes practices, representations, expressions, knowledge, skills.</p> <ul style="list-style-type: none"> • To protect cultural heritage from the adverse impacts of project activities and support its preservation. 	<p>Tangible cultural heritage in the area was investigated by mean of an archaeological impact assessment (Section 5.4). Cultural heritage is covered in Namibia under the National Heritage Act (2004).</p> <p>Intangible cultural heritage will not be significantly affected by the project, since peoples' practices,</p>

ESS No and Name	Objectives	Applicability to this project
	<ul style="list-style-type: none"> To address cultural heritage as an integral aspect of sustainable development. To promote meaningful consultation with stakeholders regarding cultural heritage. To promote the equitable sharing of benefits from the use of cultural heritage. WB ESS 8 Item 5(a) (World Bank, 2018) lists "changes in the physical environment" as a potential risk or impact on cultural heritage. The project should consider WB ESS 8 (World Bank, 2018) in terms of: <ul style="list-style-type: none"> Direct, indirect, and cumulative project-specific risks and impacts on cultural heritage. Avoid impacts, or if not possible, identify and implement measures to address impacts in accordance to the mitigation hierarchy. Relevant mitigation hierarchy steps include, for example, project relocation, project footprint modification, in situ conservation or documentation. The mitigation measures should fit a monitoring system, implementation schedule and implementation budget. Implementing globally recognized practices for investigation, and meaningful consultation with relevant stakeholders. 	<p>representations, expressions, knowledge and skills will remain unharmed. Heritage in the form of the visual landscape is affected, for some farm owners who value such, and this is addressed in Section 5.6.2.2.</p>
ESS 9 Financial Intermediaries	<ul style="list-style-type: none"> To set out how the FI will assess and manage environmental and social risks and impacts associated with the subprojects it finances. To promote good environmental and social management practices in the subprojects the FI finances. To promote good environmental and sound human resources management within the FI. 	<p>This ESS applies to Financial Intermediaries (FIs) that receive financial support from the Bank. FIs include public and private financial service providers, including national and regional development banks, which channel financial resources to a range of economic activities across industry sectors.</p> <p>ESS 9 is not applicable to this project.</p>
ESS 10 Stakeholder Engagement	<ul style="list-style-type: none"> To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties. 	<p>ESS10 is applicable to all projects funded by the WB. Key components are the Stakeholder Engagement Plan (SEP), set up to identify stakeholders and to disclose information to them during the ESIA in a</p>

ESS No and Name	Objectives	Applicability to this project
and Information Disclosure	<ul style="list-style-type: none"> • To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance. • To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them. • To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format. • To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances. 	<p>meaningful way, in order to inform the ESIA process. It also provides for stakeholder engagement and feedback during the project implementation and operation phases. It also provides for a grievance mechanism to be set up during the construction and operational phases.</p> <p>The Environmental Management Act requires public consultation but does not require a SEP, and feedback during implementation and operational phases, or grievance mechanisms.</p> <p>The SEP for the ESIA process is included in the stakeholder engagement report (Appendix E) and applicable requirements such as a grievance mechanism are included in the ESMP.</p>

4.2.2 OTHER APPLICABLE INTERNATIONAL CONVENTIONS AND GUIDELINES

The EHS (Environmental, Health and Safety Guidelines for Electric Power Transmission Distribution)², as well as the Industry Specific EHS for Electricity Power Transmission and Distribution have guidelines according to themes, which assist in screening significant risks on a project, as well as providing guidelines for their avoidance, mitigation and management. The applicability of these guidelines was considered during the impact assessment, and to incorporate the avoidance and management of specific risks into the ESMP. In particular, Occupational Health and Safety, Community Health and Safety, Waste Management, and Hazardous Materials Management guidelines are considered to be particularly relevant and have been considered and incorporated into the impact assessment and ESMP.

The Fundamental Conventions of the International Labour Organization (ILO) ³ bring together governments, employers and workers of 187 Member States (including Namibia), to set labour standards, and develop policies. They are aimed at *"promoting opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and dignity."*

The Occupational Safety and Health Convention, 1981 (No. 155) and the Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) are considered as fundamental Conventions, including:

- Freedom of Association and Protection of the Right to Organise Convention, 1948 (No. 87)
- Right to Organise and Collective Bargaining Convention, 1949 (No. 98)
- Forced Labour Convention, 1930 (No. 29) (and its 2014 Protocol)
- Abolition of Forced Labour Convention, 1957 (No. 105)
- Minimum Age Convention, 1973 (No. 138)
- Worst Forms of Child Labour Convention, 1999 (No. 182)
- Equal Remuneration Convention, 1951 (No. 100)
- Discrimination (Employment and Occupation) Convention, 1958 (No. 111)
- Occupational Safety and Health Convention, 1981 (No. 155)
- Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187)

These conventions are ratified by Namibia, are in line with the Namibian Constitution. Their principles are included in the Namibian Labour Act (11 of 2007, amended, 2012),

² <https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final+-+General+EHS+Guidelines.pdf?MOD=AJPERES>

³ www.ilo.org/global/standards/introduction-to-international-labour-standards/conventions-and-recommendations/lang--en/index.htm

which establishes comprehensive labour law for all employers and employees; with the aims: 1) to entrench fundamental labour rights and protections; 2) to regulate basic terms and conditions of employment (including minimum wages, age restrictions, and prohibits forced labour); 3) to ensure the health, safety and welfare of employees; 4) to protect employees from unfair labour practices; 5) to regulate the registration of trade unions and employers' organisations; 6) to regulate collective labour relations; and 7) to provide for the systematic prevention and resolution of labour disputes.

Furthermore, the Namibian Health and Safety Regulations provide provisions for Health and Safety matters at work, and these have been endorsed by the ILO.

The Avian Power Line Interaction Committee (APLIC) leads the electric utility industry in protecting avian resources while enhancing reliable energy delivery. Their guideline "Reducing avian collisions with power lines: the state of the art in 2012 (APLIC), was followed, together with many other bird-power line collision resources as listed in the Critical Habitat Assessment, in this study.

5 RECEIVING ENVIRONMENT

Since it is anticipated the overall biophysical baseline condition remained unchanged since the previous ESIA process was undertaken (2016-2020), the baseline information from the previous study was updated through a desk study as part of the current revision of the ESIA. In particular specific attention was paid to update information related to avifauna and vegetation, as part of the critical habitat assessment to meet the requirements of ESS6)), as well as other attributes as they pertain to transmission line impacts.

Changes in socio-economic trends are difficult to establish since there is no updated demographic data since the 2016 report. The last national census was in 2011. The essence of the information is expected to remain similar, especially concerning the land use patterns and densities in the rural orientated, low density study area. The baseline of 2016, was re-considered in 2020 and a thorough update was done of the farm owner database at the time. This dataset has again been updated and socio-economic impacts are currently being informed by the inputs from stakeholders. The database is also being updated by NamPower as they embark upon the compensation process with land owners.

One significant introduction to the baseline work, is an evaluation of potential indigenous peoples in the Project area, according to ESS7 of the World Bank: ESS7: Indigenous Peoples/ Sub-Saharan African Historically Underserved Traditional Local Communities (See **Section 6**)

5.1 BIOPHYSICAL ENVIRONMENT

The proposed Kokerboom - Auas transmission power line corridor traverses four major landscape units, namely the Nama - Karoo Basin, the Weissrand Plateau, the Kalahari Sandveld and the Khomas Hochland.

The Nama-Karoo Basin is a vast primarily colluvial sedimentary body with some extensive exposures of deeply weathered underlying Karoo formations. The basin is drained from east to west by several major ephemeral river systems including the Ganigobes, Tses and Huam. These are characterized by deeply incised streams, and more extensive but weakly developed drainage, with sparse vegetation comprising mainly scrub thornbush and narrow riparian growth on main streams.

The well-defined retreating scarp of the Weissrand Plateau lies to the east of the Nama - Karoo Basin. The surface of the Weissrand consists of deeply weathered pebbly conglomerate with some local endoreic drainage systems associated with small pans.

Parts of the Weissrand are overlain by the mobile western edges of the Kalahari Sandveld and to the north of Mariental the red Kalahari dunes are a dominant feature of the landscape, with few well-developed drainage lines.

The northern section of the transmission line route traverses the rugged terrain of the eastern Khomas Hochland, characterized by rolling hills and well-developed drainage. The generally steep hillslopes of the Khomas Hochland are associated with skeletonized soils, extensive sheet erosion and restricted deposition basins. The vegetation of the Khomas Hochland comprises deciduous highland savanna, with dense riparian growth in major river valleys.

5.1.1 CLIMATE

The study area is arid, characterised by high temperatures and low rainfall. Mean annual temperatures are 18-20°C for the Khomas Region, and 20-22 °C for the Hardap and Kharas Regions to the south. Average maximum temperatures in the Mariental – Keetmanshoop zone reach more than 36 °C, and average minimum temperatures for the same area range between less than 2 - 10 °C (Mendelsohn, et. al., 2003).

The project area is characterized by droughts and some years of high rainfall. The average annual rainfall in the Fish River catchment, is between 150 and 250 mm, which is typical of the southern and central areas of Namibia in which the project is located. However, rainfall can fluctuate significantly between years within the area. For example, historic records show that the area experienced rainfall of 675 mm during 1933/34, which was considered a big rain year event and only 45 mm during 1944 which was classified as a drought year (Muir, 2016).

5.1.2 DRAINAGE

The Flood line Evaluation Scoping Report (Muir, 2016) reports that the elements of the environment around which the flood line study was centred are essentially the catchment areas and the streams which they feed. There are some significant drainage catchments in the northern part of the proposed transmission line corridor that may affect the construction of the proposed power line. Approximately 300 km of the proposed transmission line corridor alignment will not be affected by flooding. The affected environment could thus be categorised as having a high tolerance to disturbance from the envisaged infrastructure.

Apart from the five border rivers, namely the Kunene, Okavango, Linyanti and Zambezi Rivers in the north and Orange River in the south, there is no river in Namibia that conveys water throughout the year. The largest river in the interior is the Fish River, which is impounded by the Hardap Dam near Mariental. Even this river flows only a few weeks to some months in the year. Nevertheless, considerations related to floods are decisive in estimating extreme flows in the ephemeral rivers which prevail in the study area. Namibia may be a very dry country, but it is in general not a country with low flood runoff. High intensity rainfall often falls in a very short time and catchments also run off in a short time. This results in steep flood waves with high peak values. **Figure 5-1** below shows an overview of the catchment of the study area.

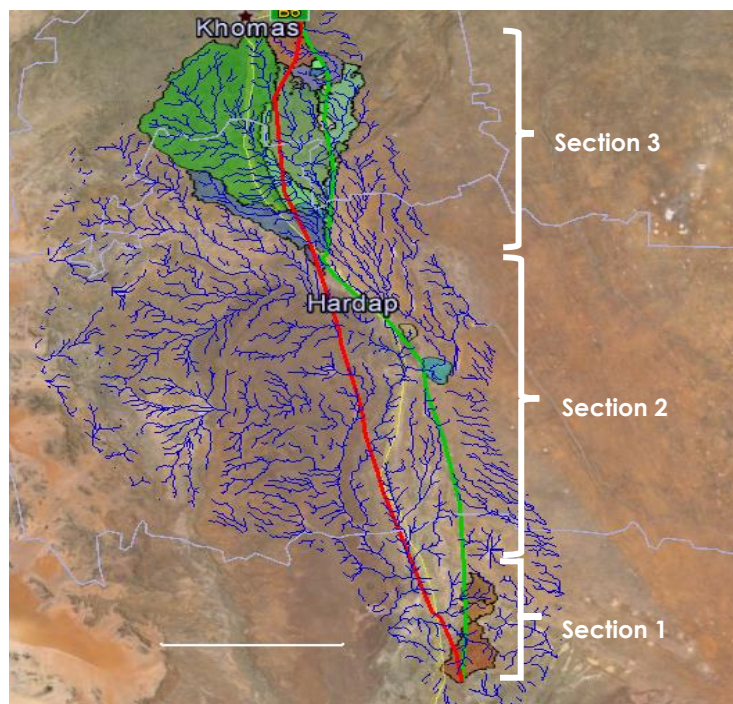


Figure 5-1: Catchment of the study area. Red line: Western alternative route, green line: eastern alternative route

The study area has been divided into three catchment areas, as shown in **Figure 5-1**:

Section 1: Extends for approximately 75 km north from the southernmost end of the route at Kokerboom substation. The southernmost section traverses the eastern edge of the Fish River Catchment (**Figure 5-2**).

Catchment C21 as marked on **Figure 5-2** has a delta which presents a flood risk. Pylons are to avoid flood areas there. There are sufficient islands for them without the need to move the route.

Section 2: Extends from Section 2, for 210 km up to the town of Kalkrand (**Figure 5-3**). It runs along the water shed between the Fish River catchment to the west and the Aub River to the east. Except for two relatively small catchments there are no drainage areas of interest and no flood risk. The two catchments here are the Dabib and Auob Rivers that flow into the Fish River north of Mariental.

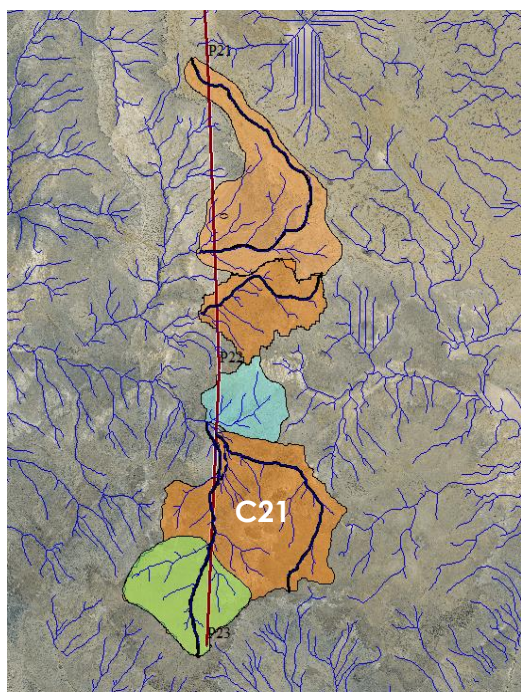


Figure 5-2: Section 1, showing Catchment C21

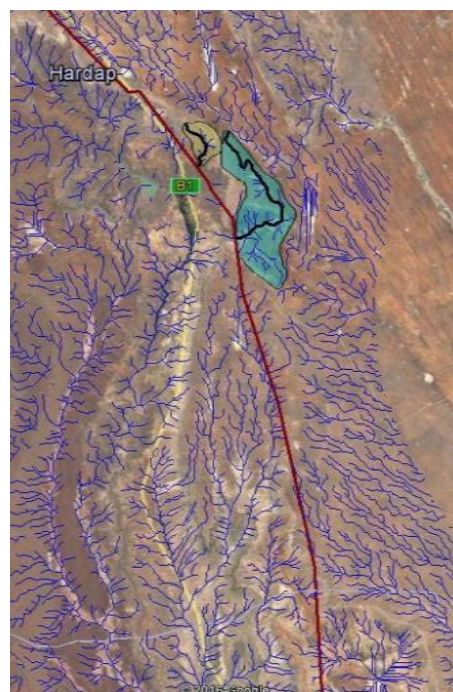


Figure 5-3: Section 2 of the project catchment areas.

Section 3: The northernmost 170km of the route. This section traverses the area with the biggest challenge related to drainage (**Figure 5-4**). It drains from the Auas Mountains just south of Windhoek and has the highest rainfall within the proposed corridor alignment. The largest catchment in this section drains the Oanob River. The north-eastern catchments are drained by the Seeis River and its tributaries. Catchment 1 (C1) on the figure does not pose a flood risk to the power line. At Catchment No 2 (C2) there is a flood risk. The powerline runs parallel to the river for approximately 1 km. Over a substantial distance the powerline route runs within the flood zone of the river. The flood risk will be avoided if the pylons are placed outside of this zone.

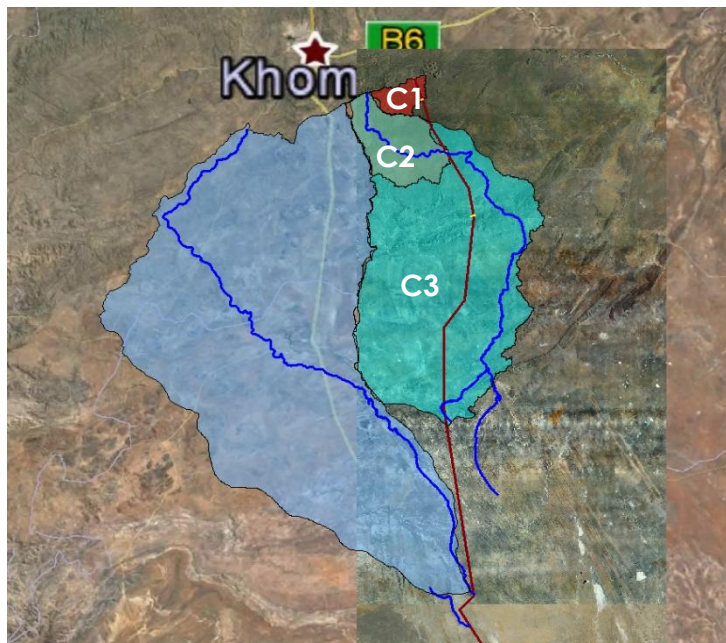


Figure 5-4: The catchments in Section 3

Catchment 3 (C3) is drained by the Skaap River, which is very active in its upper reaches, but as it enters the sandy Kalahari, the water seeps into the sand. In fact, the entire Oanob and Skaap rivers vanish into a series of pans between Tsumis and Uhlenhorst. There is no flood risk associated with the catchments.

5.1.3 GROUNDWATER

According available data (Struckmeier, ed.,2003), the general groundwater yields are classified as having a low potential (yields of 0.5-3m³/h) interspersed with areas with a medium potential (3-15m³/h). Borehole yields on individual farms are currently unknown. Impacts on low yielding boreholes, particularly, could be high.

5.1.4 VEGETATION

This section summarizes the key findings from the Biodiversity Report attached to this ESIA in **Appendix F**. The specialist divided the study corridor into three vegetation zones of varying sensitivity, as indicated in

Figure 5-5 below.



Figure 5-5: The three vegetation zones identified in the study area

Section A Dwarf Shrub Savanna, Figure 5-5

The proposed transmission line crosses the Dwarf Shrub Savanna, which forms part of the Nama-Karoo Biome for approximately 300km from the Kokerboom substation to just north of Mariental, approximately 15 km north of Kalkrand.

This zone “has shallow, stony soils that carry a predominance of grasses and Karoo shrubs. Sizeable woody species are largely confined to drainage lines and the verges of seasonally wet depressions and pans, including protected species such as *Vachellia erioloba*, *Ziziphus mucronata*, *Searsia lancea* and *Euclea pseudebenus*. Protected woody species of a more scattered distribution in the zone include *Aloe dichotoma*, *Albizia anthelmintica*, *Boscia albitrunca* and *Maerua schinzii*. Although eighteen (18) endemic and 11 protected species are recorded for the general area, no species of high conservation concern (range or habitat restricted endemic or protected species) are presently known or expected to occur in any meaningful numbers along the route in this vegetation zone. Those recorded in the project area are all reasonably widespread and very unlikely to be threatened by the activities associated with the proposed project. However, *Aloe dichotoma* (Kokerboom, Quiver tree) does occasionally form dense stands which would make them of concern in that instance (should they fall within the servitude area)” (Mannheimer, 2016).

The specialist therefore considers this zone to have a low sensitivity.

Section B Mixed Tree and Shrub Savanna, Figure 5-5

Following from the Dwarf Shrub Savanna, the line continues through the Mixed Tree and Shrub Savanna of the Southern Kalahari for about 55 km until it reaches the foothills of the Highland Savanna. This section is characterized by red sandy dunes interspersed with harder inter-dune valleys with stonier, harder substrates. Harder, more compact soils are also characteristic of the riverbanks. Many small pans are scattered throughout the zone. One wide-ranging endemic herb occurs in the vicinity of the route. Several protected tree species are common in this vegetation type, including *Vachellia erioloba*, *Albizia anthelmintica*, *Boscia albitrunca* and *Maerua schinzii*. *Ziziphus mucronata* is also typical along rivers and drainage lines. The route east of Tsumis between approximately 23° 42' 14" s and 23° 51' 34" S (indicated in red in **Figure 5-6**) are of particular concern regarding dense stands of *Vachellia erioloba*. Dune areas also support large specimens of *Vachellia erioloba* (new name *Vachellia erioloba*) and *Albizia anthelmintica*. They are valued by farmers for the shade and the forage they offer to stock animals. This is valuable woodland, and therefore is considered “medium” to “high” in terms of sensitivity.

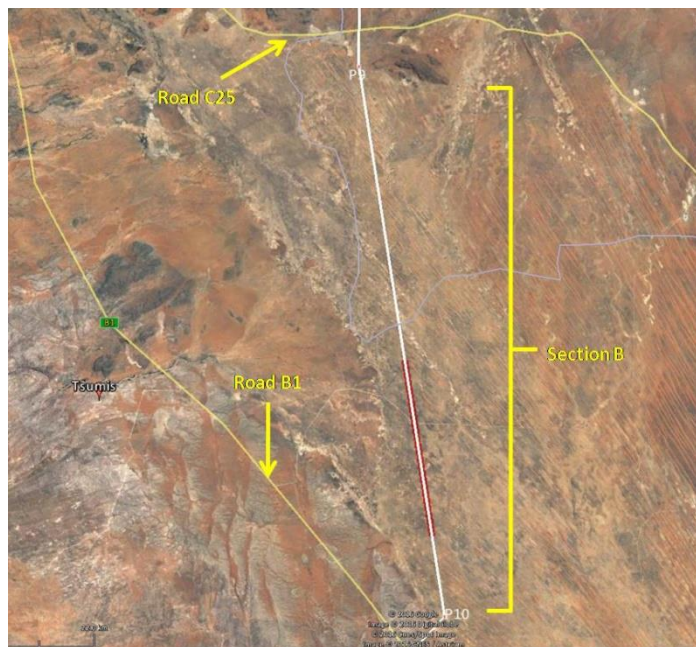


Figure 5-6 *Acacia erioloba* stand located in Section B

Section C Highland Savanna, Figure 5-5

The proposed transmission line route traverses the Highland Savanna for about 100 km before reaching the Auas substation.

This is one of the zones of highest plant diversity and endemism in Namibia. It includes many protected tree species, such as *Vachellia erioloba*, *Aloe littoralis*, *Boscia albitrunca*, *Albizia anthelmintica*, *Maerua schinzii* and *Erythrina decora* as well as those typical of drainage lines, i.e.: *Ziziphus mucronata* and *Searsia lancea*. Thirty-six endemic and 9 protected species have been recorded in the area around the proposed alignment. Species of potential concern include the protected trees and a number of other protected and/or restricted range endemics ((e.g., *Anacampseros filamentosa* subsp. *tomentosa*, *Aloe viridiflora*). With the exception of *Vachellia erioloba*, which occurs in dense stands over much of this section, and other protected trees that occur as scattered individuals (e.g., *Boscia albitrunca*, *Albizia anthelmintica*), the species of highest concern occur entirely or mostly on high-lying slopes or at the edges of pans, which are not affected to any large extent by this project." (Mannheimer, 2016). The sensitivity of the zone is nevertheless rated as "high".

Species assessed that require mitigation within the proposed power line corridor, and their associated IUCN listing is presented in **Table 5-1** below. No IUCN listed Red Data species of any threatened category were listed.

Table 5-1: Species of concern which require mitigation measures.

Species	Conservation status		Range in Namibia	Habitat restricted if	Occurrence in vicinity of proposed route if of possible concern	Comments
	Local	IUCN				
Vachellia erioloba	Protected	LC	Widespread	-	Dense populations near Tsumis as well as scattered from just south of bend point 4 (P4, Figure 5-5), as well as in riparian areas alongside drainage lines and on dune areas.	-
Albizia anthelmintica	Protected	LC	Widespread	-	-	-
Aloe dichotoma (Aloidendron dichotomum)	Protected	VU	Widespread sometimes in dense stands	-	Scattered or stands of the species occur in the dwarf shrub savanna zone.	Specimens may be preserved by re-routing the line during survey.
Aloe littoralis	Protected	LC	Widespread, sometimes in dense stands	-	-	-
Boscia albitrunca	Protected	LC	Widespread	-	-	-
Cyperus rehmi	Endemic		Known distribution highly restricted but almost certainly under collected	Pans, seasonally wet areas	Farm Binsenheim/Rietfontein	Unlikely to be affected
Euclea pseudebenus	Protected	LC	Widespread	-	-	-
Maerua schinzii	Protected	LC	Widespread	-	-	-
Ziziphus mucronata	Protected	LC	Widespread	-	-	-

5.2 FAUNA

Overall terrestrial diversity in the study area is relatively high in the highlands surrounding Windhoek, decreasing southwards where the diversity is low between Mariental and Keetmanshoop (Mendehlson et al., 2002). This pattern generally follows the diversity of vegetation species which is high in the north of the study area, decreasing to the south. In the highlands to the north, at least 8 amphibian species, 61 mammal species, and 71 reptile species are expected to occur, particularly in the biologically diverse Auas mountains and other hills and inselbergs, including the Nauaspoort mountains through which the route crosses.

To the south, between Mariental and Keetmanshoop, the number of fauna species that are expected to occur are significantly lower. Mammal species are an exception, which are as diverse in the southern parts of the study area as in the north, but occurring in lower numbers due to the aridity of the environment.

The route generally avoids sensitive habitats for fauna, including river beds, higher lying areas, and rocky ridges. The main threat to loss of fauna on this project, is habitat loss and fragmentation, which is being avoided through careful route planning to avoid sensitive habitats and general habitat degradation and fragmentation. The route will cause a limited effect on the habitats it traverses, and there are no specific known fauna populations being put at risk due to this project. The mitigation included in the ESMP and which will be developed in the Biodiversity Management Plan to avoid unnecessary habitat destruction is considered adequate for the protection of faunal diversity in the project corridor. Therefore, no further studies were done to address impact on fauna, except for impact on avifauna, which is the subject of the next section.

5.3 AVIFAUNA

A summary of the receiving avifaunal environment, as documented by Birds and Bats Unlimited Consultants (Rob Simmons, 2018), is provided here. The proposed 400 kV power line corridor traverses two biomes and four vegetation types, as shown in **Figure 5-7** below.

The Tree-and-shrub Savanna supports a number of near endemic birds to Namibia, for which Namibia has primary global responsibility. The Nama Karoo and Acacia Tree-and-shrub Savanna biomes provides the core range of a number of large cursorial birds such as bustards (e.g., Ludwig's Bustard and Kori Bustard), korhaans and Secretarybird which are at high risk from power line collision. These three species have recently been listed as threatened in Namibia because of high incidents of mortality on power lines. Other species could also potentially be impacted, including vultures, eagles and flamingos

(e.g., Great Flamingo). Both biomes provide important habitat for many species endemic to the south-west arid zoo-geographic zone of southern Africa, with 14 of these species having 40% or more of their global populations within Namibia.

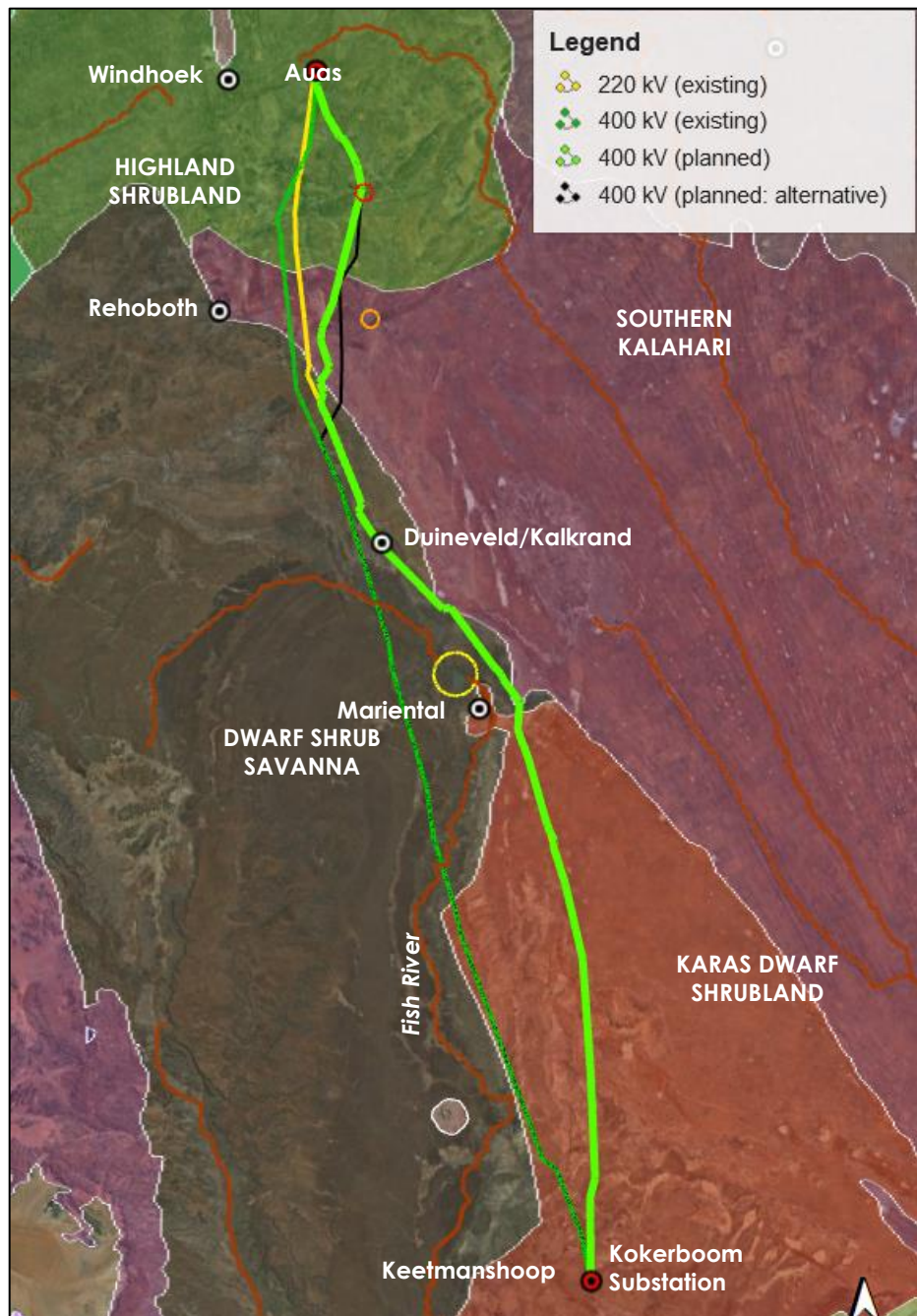


Figure 5-7: Vegetation types of the project area (Karas Dwarf Shrubland; Dwarf Shrub Savanna; Southern Kalahari; Highland Shrubland); and potentially sensitive avifauna habitats (orange circle = White-backed Vulture breeding area; red circle = Verreaux's Eagle breeding area; yellow circle = Hardap Dam; brown lines = ephemeral rivers) (based on a Google Earth image; EIS 2023).

Within each of the four vegetation types traversed by the proposed transmission line, the following **(Table 5-2)** emerged:

Table 5-2: Number of bird species recorded, Red Data species, Namibian endemic and near-endemic species, and southern African endemics in the four vegetation types traversed by the proposed Kokerboom to Auas 400 kV transmission line corridor.

Section of transmission line	Approx. distance (km)	Biome	Vegetation type	No. survey visits	No. bird species	No. Red Data species	No. Namibia endemics	No. southern African endemics
Kokerboom to Mariental	205	Nama Karoo	Karas Dwarf Shrubland	41	113	8	0	41
Mariental to Duineveld	142	Nama Karoo	Dwarf Shrub Savanna (eastern edge)	193	200	12	1	63
Duineveld to Rehoboth	43	Acacia Tree-and-shrub Savanna	Southern Kalahari (western edge)	16	117	8	0	33
Rehoboth to Auas	77	Acacia Tree-and-shrub Savanna	Highland Shrubland	57	177	11	7	41

, the following is summarised:

- 1) In the Karas Dwarf Shrubland of the Nama Karoo biome, 113 bird species were observed during 41 survey visits within this vegetation type within the vicinity of the proposed transmission line route. Of the 113 species, 8 species are listed as "Threatened" or "Near Threatened" in the Namibia's Red Data book (Simmons et al. 2015). No endemic species to Namibia, was recorded to occur in this section, however, 41 species are considered to be endemic to the south-west arid zoogeographic zone of southern Africa of which 8 species have 40% or more of their global range within Namibia.
- 2) In the Dwarf Shrub Savanna vegetation zone of the Nama Karoo biome, 200 bird species were observed during 193 survey visits within this vegetation type within the vicinity of the proposed transmission line route. This large species diversity is influenced by the presence of the Hardap Dam and its wetland habitat within an otherwise arid and semi-arid landscape. Twelve species along this section of the proposed line corridor are listed as Threatened or Near Threatened in the Namibia Red Data book, one species is considered near-endemic to Namibia and 63 species

are endemic to southern Africa, of which 14 species have 40% or more of the global range within Namibia.

- 3) In the Southern Kalahari of the Tree-and-shrub Savanna biome, 11 bird species were identified during 16 survey visits within this vegetation type within the vicinity of the proposed transmission line route. This stretch of line has received the least bird survey work, reflected in the recorded species diversity. Eight species along this section of the proposed line are listed as Threatened in the Namibia Red Data book. No Namibian endemic or near-endemic species were recorded in this section however, 3) species are considered to be endemic to southern African of which 10 species have 40% or more of their global range in Namibia.
- 4) In the Highland Savanna of the Tree-and-shrub Savanna biome, 177 bird species were recorded during fifty-seven 57 survey visits within this vegetation type within the vicinity of the proposed transmission line route. This section of the proposed line has eleven 11 Threatened and Near Threatened bird species listed, 6 species near-endemic to Namibia and 41 southern African endemics of which twelve 12 species have 40% or more of their global range in Namibia.

In total 16 bird species of interest have been recorded in the vicinity of the proposed transmission line (**Table 5-3**). One species is listed as Critically Endangered (CR), 5 are listed as Endangered (EN), 2 as Vulnerable (VU) and 8 as Least Concern (LC) according to the IUCN Red List of 2022.

Table 5-3: Bird species of interest in the vicinity of the transmission line

Species	Conservation Status		Local abundance in vegetation types			
	Local	IUCN	Karas Dwarf Shrubland	Dwarf Shrub Savanna	Southern Kalahari	Highland Shrubland
White-backed Vulture	CR	CR	U	U	C	U
Cape Vulture	CR	VU	-	R	-	-
Lappet-faced Vulture	EN	EN	R	R	C	U
Black Harrier	EN	EN	-	R	-	R
Martial Eagle	EN	EN	U	U	U	R
Booted eagle	EN	LC	R	U	-	-
Tawny Eagle	EN	VU	-	R	R	U
Verreaux Eagle	NT	-	C	U	-	U
Secretary bird	VU	EN	U	R	U	U
Ludwig Bustard	EN	EN	R	U	-	-
Kori Bustard	NT	NT	C	U	-	R
Great White Pelican	VU	LC	-	CC	-	-

Species	Conservation Status		Local abundance in vegetation types			
	Local	IUCN	Karas Dwarf Shrubland	Dwarf Shrub Savanna	Southern Kalahari	Highland Shrubland
Black Stork	EN	LC	-	R	-	-
Violet Wood Hoopoe	EN	LC	-	-	-	R
Ruppells Parrot	NT	-	-	-	C	U
Damara Hornbill	-	LC	-	R	-	R
Monteiro's Hornbill	-	LC	-	-	-	R

(CR=Critical, EN=Endangered, NT=Near Threatened, VU=Vulnerable, LC=Least Concern, R=Rare, C=Common, U=Uncommon)

5.4 BIODIVERSITY CONSERVATION

Legally protected and internationally and regionally recognized areas of biodiversity value in the greater study area include the **Hardap Game Reserve (Hardap Recreational Area)**, a protected area (National Park) in terms of the Namibian Parks and Wildlife Act. This reserve has been designated around the Hardap Dam, constructed on the Fish River in 1963 to supply water to the Hardap Region. The reserve is a recreational resort, and supports a variety of game, which add to its tourism value. The dam is an Important Bird Area (an area designated as important for birds) and some 260 bird species are found within the reserve in reasonably large numbers. The Hardap Dam is one of only two sites in Namibia that regularly hold large numbers of White Pelican which breed on the rocky islands near the west shores. Other species which occur in the reserve include, among others, Darter, Little Egret, African Spoonbill, occasionally Whitebacked Duck, Booted Eagles, and breeding Fish Eagles, which occurs on the highest cliffs surrounding the dam (Simmons, et. al, 1999).

The transmission line skirts the closest corner of the Hardap Game Reserve by approximately 10 km.

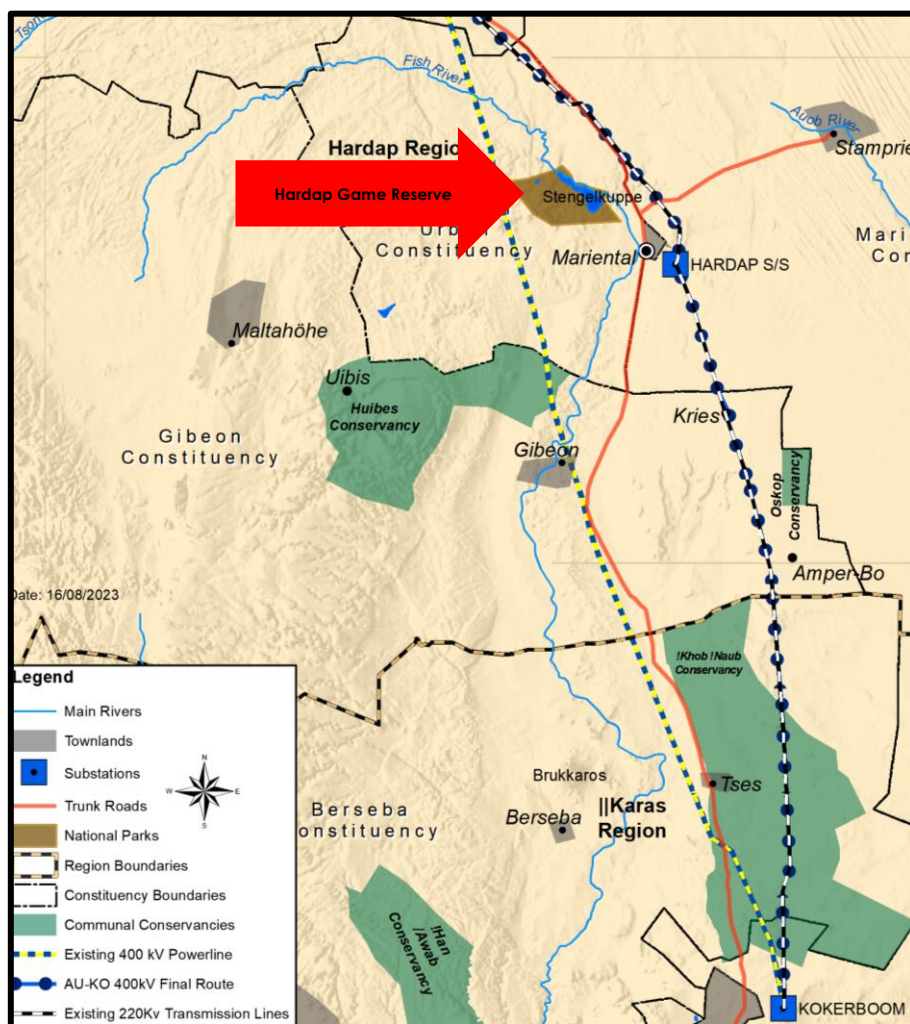


Figure 5-8: Locality of protected areas in the study area.

The **!Khom! Naub Conservancy (Figure 1-1)**, to the south of the study area, has wildlife populations for which hunting permits are issued by the Ministry of Environment, Forestry and Tourism, administered by its appointed conservancy committee. This serves as an income for the local population. Engagements with the committee members have indicated that the transmission line will not be a threat to these wildlife populations since it is aligned 1) adjacent to the existing 220 kV transmission line, away from the more remote areas where hunting is carried out; and 2) habitat modification will be very limited, and grazing can continue once the line is operational. Furthermore, the wildlife occurring in the conservancy is widespread and not threatened according to IUCN categories. Therefore, this conservancy does not trigger any of the ESS6 categories.

5.5 ARCHAEOLOGY

According to the Archaeological Assessment Report (**Appendix F**); the southern Namibia, due to its aridity, presents a marginal environment for human occupation, and in the past, particularly during periods of climatic cooling and hyper-aridity, the region may have been quite inimical to settlement. These conditions are reflected in the available archaeological evidence, which spans the last 0.8 million years with a sequence that is characterized by short periods of relatively intensive occupation, and long periods in which there appears to have been little or no human presence.

Archaeological sites span the last two million years with the mid-Pleistocene, late Holocene and historic periods being well represented.

Pleistocene stone artefact finds are associated with the generally deflated surface of the Nama Karoo Basin and the retreating scarp line of the Weissrand Plateau. In confirmation of observations from earlier archaeological surveys the Kalahari Sandveld and Khomas Hochland are generally associated with younger archaeological sites related to Holocene occupation of the central parts of Namibia. These younger sites also include a number of early colonial settlements and associated features such as cemeteries.

Most of the area to be affected by the project is considered to be of relatively low archaeological sensitivity.

Incidental records of archaeological sites in southern Namibia confirm that the entire Quaternary sequence would be represented, with a preponderance of Pleistocene artefact scatters. The same records suggest that mid-Holocene to Recent archaeological sites would be present, but that few of these would be attributable to nomadic pastoralist settlement dating to within the last two millennia. Rock art sites would be very scarce, as would be burial sites marked by stone cairns. Published data on early colonial settlement (Drechsler 1980; Lau 1987) suggests that a field survey would encounter evidence of early farming settlement and of military activity relating to the early anti-colonial uprisings. Pre-Quaternary fossil beds are found in the Permian Whitehill and Prince Albert Formations which outcrop in this area (Oelofsen 1981).

The specialist sampled twenty sites along the route (**Figure 5-9**).

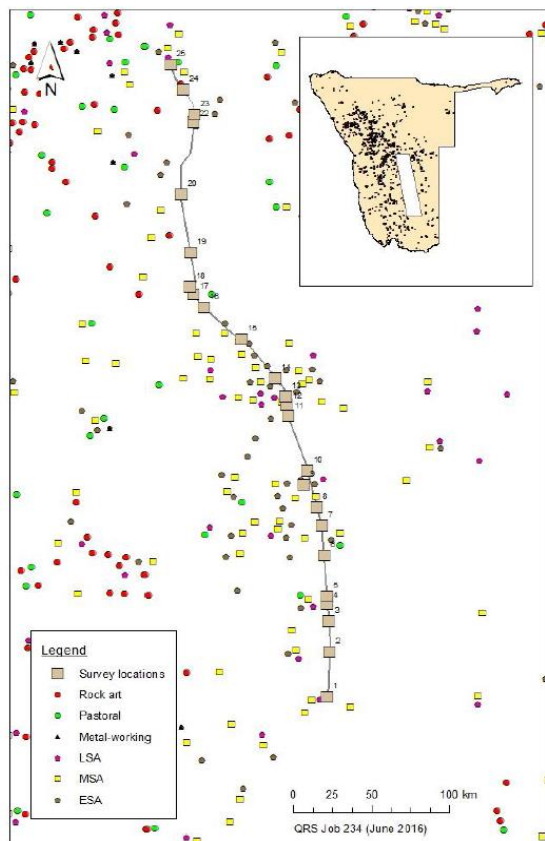


Figure 5-9: Proposed Kokerboom - Auas transmission line corridor indicating the positions of 25 archaeological survey sites in relation to known archaeological sites in the region.

According to the specialist, an earlier survey, about 25 km to the west of the proposed transmission line corridor route, recorded some minor fossiliferous Prince Albert and Whitehill Formation outcrops. A small number of early Pleistocene stone artefact occurrences with some suspected Oldowan tool scatters were also located, along with Mid-Pleistocene archaeological remains included isolated Acheulean bifacial tools, and Victoria West core flakes and Terminal Pleistocene finds included blade flakes with some evidence of Levallois reduction. The Holocene occupation of the area was represented by occasional scatters of stone artefact debris, while more recent occupation included minor evidence of early colonial farming activities and some possible evidence relating to the 1915 South African invasion of southern Namibia.

The project specific survey confirmed the above observations with widespread mid- to late Pleistocene artefact scatters and some minor Holocene occurrences of artefact debris. However, none of these lay directly within the area to be affected by the proposed transmission line. Only two significant sites were located:

- QRS 243/604 S26.14268 E18.30721: Pre-colonial burial cairn 2m diameter, slightly dispersed, on stream terrace.
- QRS 243/605 S26.14444 E18.30861: Colonial era grave, 2.2m long, unmarked, on stream terrace.

These sites are in the South of the study area, approximately 4km east of the transmission line servitude. Earlier work on the Wiessrand Plateau located Mid-to late Pleistocene stone artefact scatters, but none were in primary context and appeared to have been affected by sheet erosion. Such minor occurrences (pebble tools) were also located during the present survey.

The specialist's database also shows mid-Pleistocene and terminal-Pleistocene stone artefact sites from the western Kalahari sandveld. These seem to be associated with seasonal pans. Other archaeological features of the Kalahari Sandveld include remains of nomadic pastoral mat house circles which probably date to within the last 1 000 years, and occasional finds of early colonial settlement. Pre-Pleistocene remains include Palaeozoic trace fossils associated with localized outcrops of the Zamnareb Formation. Minor occurrences were located from these periods.

The Khomas Hochland area is generally lacking in pre-Holocene archaeological remains probably due to the effect of sheet erosion. Rock shelter sites associated with rock art (paintings and engravings) and shallow occupation deposits are therefore common there. Colonial era sites are relatively common and often well preserved. One fenced Historic/modern farm cemetery with more than 50 graves, fenced, was found approximately 2km east of the centreline.

The Significance and Vulnerability of archaeological sites within the transmission line buffer zone is set out in **Table 5-3** below.

Table 5-3: Archaeological and related sites within the proposed Kokerboom - Auas transmission line corridor

Site number	Sensitivity
Nama Karoo Basin	
QRS 234/604	12 (Med)
QRS 234/605	12 (Med)
QRS 234/606	1 (Low)
QRS 234/607	1 (Low)
QRS 234/608	1 (Low)
QRS 234/609	1 (Low)
Weissrand Plateau	
QRS 234/611	1 (Low)
QRS 234/612	1 (Low)

Kalahari Sandveld	
QRS 234/613	1 (Low)
QRS 234/614	1 (Low)
Khomas Hochland	
QRS 234/615	4 (Med)

5.6 SOCIO-ECONOMIC ENVIRONMENT

The social impact assessment completed for the ESIA process describes the affected social environment of the project area (Desai, 2016, **Appendix F**). The data assembled for the study in 2016 was revisited in 2020 according to known trends, although there is no formal updated demographic data since 2011. The fieldwork conducted in 2016 is still considered valid, in terms of identifying socio-economic characteristics of the area. The specific details of project affected persons are constantly being updated with each new round of stakeholder consultation and with the compensation process of NamPower. Salient aspects which may interact most with the project are highlighted in this section.

Baseline Socio-economic elements of the project which inform the World Bank Environmental and Social Framework, specifically the ESF:

- Environmental and Social Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities;
- Environmental and Social Standard 4: Community Health and Safety; and
- Environmental and Social Standard 5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement,

are also provided in this Section.

5.6.1 Affected area

Indirectly affected area: The Project has the potential to generate national, regional and constituency level impacts. Some of the positive impacts may be experienced at the national, regional and constituency levels, while most of the negative impacts may affect a smaller area, most notably the constituency level. The line will pass within 20km of a number of towns; including (from north to south) Dordabis (~13.5km⁴), Duineveld (~1km), Kalkrand (~0.5km), Mariental (~7km), Kries (~ closest corner 300m), Amper-Bo (~3km) and Tses (16.5km).

⁴ Distances were measured from the point in town closest to the proposed transmission line to the centre line.

Directly affected area: The proposed transmission line corridor (500km x 500m) traverses ~89 farms (**Appendix F**). These farms will experience the most direct impacts and are therefore considered to represent the direct area of influence.

Table 5-4 Proposed Project affected areas (north to south)

Indirectly Affected Area				Directly Affected Area
Country	Region	Constituency	Closest Town/ Settlement	Farms
Namibia	Khomas	Windhoek Rural	Dordabis	See Appendix F
		Mariental Rural	Mariental (Mariental Urban)	
		Mariental Urban	Mariental	
		Rehoboth Rural	Duineveld, Kalkrand	
		Gibeon	Kries, Gibeon, Amper-Bo	
	//Kararas	Berseba	Tses	
		Keetmanshoop Rural	Keetmanshoop	

The proposed transmission line traverses three (3) regions (namely Khomas, Hardap and //Kararas). Khomas Region is centrally located and landlocked; it has a population density of 9.3 people per km². Hardap has a low population density of 0.7 people per km². The //Kararas Region is the most southern and largest region in Namibia, with an area of 161,215km²; it is the least densely populated of Namibia's 14 regions with only 0.5 people per km². The line passes through 6 constituencies, the majority of which are rural (see **Table 5-4**).

5.6.2 Predominant land use and economic activity in the affected area

5.6.2.1 Agriculture

Namibia is the most arid country in sub-Saharan Africa; as such land is fragile and productivity is low. In addition, there is substantial land degradation due to large numbers of livestock exceeding the carrying capacity of the rangeland, as well as inappropriate agricultural practices⁵.

⁵ Property Rights and Resource Governance Profile: Namibia, 2010.

Due to the arid climate, pastoral livestock farming is the most common agricultural practice in all regions of the project area (~8% in Khomas, ~19% in Hardap, and 12% in //Karas). Crop and poultry farming are considerably less significant, specifically in Hardap and //Karas. The project-affected constituencies throughout the 3 regions are largely rural in nature and heavily reliant on small livestock farming. Overall, livestock farming was even more significant at the constituency-level throughout the Project area (Berseba (~45%), Gibeon (~37%), Rehoboth Rural (~26%), Keetmanshoop Rural (~24%), Mariental Rural (~21%), and Windhoek Rural (~17%))⁶.

In the west, south and central areas of Namibia, the majority of households live in small villages and their livestock forage in the surrounding commonage pastures (communal land). On average, households have no more than 10 cattle, goats or sheep⁷.

All the potentially Project-affected farms interviewed indicated that they are involved in agriculture. The majority of the farms are used for commercial livestock farming (cattle, sheep and goats), the animals are sold on auction or to the local abattoirs. Many of the farms also farm game; the game is sold for meat, for relocation to other farms or for hunting.

There are several other farms that practice commercial livestock agriculture and have relatively significant tourism offerings (hunting and eco-tourism including (hiking/ walking, horse riding, mountain biking, and photography); they include but are not limited to Hohenau, Hohewarte, Voigtland, Koichas, Rem. Of Ptn. 5 of Orab, Wilderness Rem Ptn⁸.

Most of the commercial farmers reside on the farms together with their workers. Some landowners live and work in town and use their farms as weekend retreats, the workers manage the livestock in the absence of the landowner.

The 'resettlement farms' are required, by contract, to be farmed commercially. The communal land is expansive and largely unfenced, livestock roam freely over the area and due to the general lack of effective land management and lack of water, the area is currently extremely over-grazed and degraded – see **Figure 5-10**). There are no reports of tourism or other economic activities on the 'resettlement farms or communal land.

⁶ Population and Housing Census Main Report (2013), Population and Housing Census: Khomas Regional Profile (2014), Population and Housing Census: Hardap Regional Profile (2014), and Population and Housing Census: //Karas Regional Profile (2014).

⁷ An Overview of Communal Land Tenure in Namibia, 2012.

⁸ This information is based on key informant interviews; not all land owners/users were contacted/ available for interviews.



Figure 5-10: Private commercial farm (left) versus State land (right)

5.6.2.2 Tourism and conservancy area

In 2014, there were nearly 1.5 million foreign visitors to Namibia. The majority (~89%) of the visitors were tourists; tourism grew by 34% between 2010 and 2014 and by 12% between 2013 and 2014⁹.

The total economic contribution of travel and tourism equated to nearly 15% of Namibia's GDP in 2014, and is forecast to rise by 5.6% in 2015, and to rise by 7.2% per annum until 2025 (21.6% of GDP)¹⁰. The total economic contribution includes all direct, indirect and induced expenditure across the economy. Domestic tourists accounted for more than 56% of all direct expenditure in this sector¹¹.

The project affected regions are sparsely populated and generally valued for their vast open spaces. Tourist attractions are focussed along the coast, with a number of specific attractions located throughout the regions; namely the Hardap Dam, Fish River Canyon and the hot water springs at Ai-Ais. The Project area is primarily used for stock farming; increasingly some of the farmers are offering hunting and eco-tourism (hiking, horse riding, mountain biking) experiences.

There are 3 known farms that are used solely for tourism activities; namely Rem of Gravenstein, Ptn 2 of Duineveld and Ptn 3 of Duineveld. Over the past 5 years, all infrastructure and domesticated livestock have been removed and game introduced to restore these farms to their natural and pristine state. The farms offer exclusive hunting and eco-tourism options to guests.

⁹ Tourist Statistical Report, 2014.

¹⁰ Travel and Tourism Economic Impact Namibia, 2015.

¹¹ Travel and Tourism Economic Impact Namibia, 2015.

Tourist numbers are reported to have been increasing into the area¹², specifically to the farms in Khomas and Rehoboth Rural constituencies due to their relative proximity to Windhoek. The tourists that visit these farms include Namibians, South Africans, Americans and Europeans. The tourism industry took a toll during the COVID-19 period, with many lodges closing down. International tourism is slowly recovering.

Figure 5-11 shows the existence of a conservancy, namely! Khob! Naub, in the South of the study area. This conservancy provides an additional income to the community through hunting activities. It has seven volunteer Community Game Guards. The leadership of the conservancy were involved in the stakeholder consultation process, and it was confirmed that none of their activities will be affected by the proposed power line.

5.6.3 Land Tenure and Management

Of relevance to this Project are private farms (ownership/ freehold tenure), and state-owned land (communal and leasehold tenure). **Figure 5-11** shows the land tenure traversed by the line.

- **Private ownership/ freehold tenure:** Owners of freehold land in Namibia have rights to hold the land in perpetuity, to use, transfer, and dispose of the land, and to exclude others from the land. Forty-four percent of Namibia's land comprises freehold tenure.
- **Communal tenure:** About 38% of Namibia is designated communal land. All communal land is held in trust by the state, as stipulated in Article 17 (1) of the Communal Land Reform Act of 2002: *"Subject to the provisions of this Act, all communal land areas vest in the State in trust for the benefit of the traditional communities residing in those areas and for the purpose of promoting the economic and social development of the people of Namibia, in particular the landless and those with insufficient access to land who are not in formal employment or engaged in non-agriculture business activities."*

Communal land cannot be sold; transfers of use rights are permissible and must be administered by Traditional Authorities and Land Boards. Traditional Authorities and Land Boards are responsible for allocating land for residences, agriculture, or other uses recognised by the Minister. All communal land is registered with the Land Board.

- **Leasehold tenure:** Common law and the Communal Land Reform Act allow for land leases. Leases of communal and commercial land can be granted by

¹² Several of the land owners reported that the tourism market is increasing.

Communal Land Boards and government officials for a period of 99 years and may be transferred, inherited, renewed, and mortgaged. Namibians, who were historically unable to access land, can apply for the use of commercial agricultural land. The relevant authority will assign land to these farmers on a contract basis, they are referred to as 'resettlement farmers'; it is expected that the land must be farmed commercially¹³.

5.6.4 Project Area

5.6.4.1 Farm Status

The proposed transmission line passes through 89 farms¹⁴, the distribution and ownership status¹⁵ of these farms is presented in **Table 5-5**.

Table 5-5: Distribution and tenure status of affected farms

Region	Constituency	Total Farms	Private		State-Owned	Unknown
			Individuals	Companies		
Khomas	Windhoek Rural	28	22	6	-	-
Hardap	Mariental Rural	19	10	5	3	1
	Mariental Urban	1	1	-	-	-
	Rehoboth Rural	18	13	2	3	-
	Gibeon	10	-	-	10	-
//Karas	Berseba	6	-	1	5	-
	Keetmanshoop Rural	7	2	-	5	-
TOTAL		89	50	14	24	1

Source: Surveyor General, May 2016 and personal interviews, October 2016, cited in Desai, 2016.

The farms located in Windhoek Rural are 100% privately owned by individuals or companies. In Mariental Rural, Mariental Urban and Rehoboth Constituencies, ~82% of the farms are privately owned and 16% are state-owned.

The Rehoboth 'Baster Gebiet' is largely located in Rehoboth Constituency and crosses the boundary into the southern parts of Windhoek Rural Constituency. 'Baster Gebiet' refers to land located in the vicinity of Rehoboth, Duineveld and Kalkrand towns. The Rehoboth Basters, amongst other 'Baster' groups, migrated north of the Orange River, as they were not permitted to own land in the Cape. They searched for new homes and secure pastures. With Namibian independence, their communal 'Gebiet' ceased to exist; the land was divided up into privately owned freehold farms (registered to individual Basters); together with other factors, this made it difficult for the Baster community to retain historical

¹³ Pers comms, various respondents, October 2016.

¹⁴ This information was collected from the Deeds Office. The accuracy of the information is variable.

¹⁵ The ownership status is as captured at the Deeds Office in 2009.

cultural cohesion¹⁶. These farms are often divided between family members following the death of the registered owners; this occurs informally and is not reflected at the Deeds Office. As such, in practice, these farms may be smaller than those recorded at the Deeds Office.

South of Kries, almost 100% of the farms are state-owned in Gibeon and Berseba constituencies. Five of the 7 affected farms in Keetmanshoop Rural (71%) are state-owned and the remaining 2 are private. In Gibeon and Berseba, some of the state-owned land is leased on a contract basis as 'resettlement farms'; however, the majority of state land is communal and under the jurisdiction of the Traditional Authorities. The Ministry of Land Reform has over-arching responsibility for all state-owned land.

Straddling the boundary of the Hardap and //Karas regions is the communal land (this includes the pre-independence private farms); see **Table 5-5** and **Appendix 2 in the specialist study, Appendix F**). The proposed transmission line will run through this area, ending approximately 23km north-east of Keetmanshoop. The communal area is referred to as Namaland and is occupied and used by the Nama people. Kries, Gibeon, Amper-Bo, and Tses are some of the established settlements that accommodate many of the Nama households, education and healthcare facilities. There are structures (including kraals, water points, small houses) scattered throughout the communal area, however these are sparsely distributed and the transmission line is routed to avoid all structures. See also a discussion on the Nama people in **Section 6** below.

Based on the information available from the Deeds Office, the farms vary from large commercial farms to subsistence-based farms. The farms range in size as follows:

- Windhoek Rural – 55,7143ha to 12486,3955ha (average 4234ha¹⁷);
- Mariental Rural – 2132,5081ha to 21125,4031ha (average 6634ha¹⁸);
- Mariental Urban – 400,3935ha¹⁹;
- Rehoboth Rural– 0,1050ha to 2950,5441ha (average 1482ha²⁰);
- Gibeon – 2184,8179ha to 10384,1156ha (average 6268ha²¹);
- Berseba – incomplete information²²; and
- Keetmanshoop Rural – 2158,2846ha to 12483,0890ha (average 6724ha²³).

¹⁶ Rehoboth, Namibia – Past & Present, 2012.

¹⁷ Average based on 20 farms.

¹⁸ Average based on 16 farms.

¹⁹ Only 1 affected farm in Mariental Urban.

²⁰ Average based on 10 farms.

²¹ Average based on 10 farms.

²² Farm area only provided for 1 out of 6 farms.

²³ Average based on 6 affected farms.

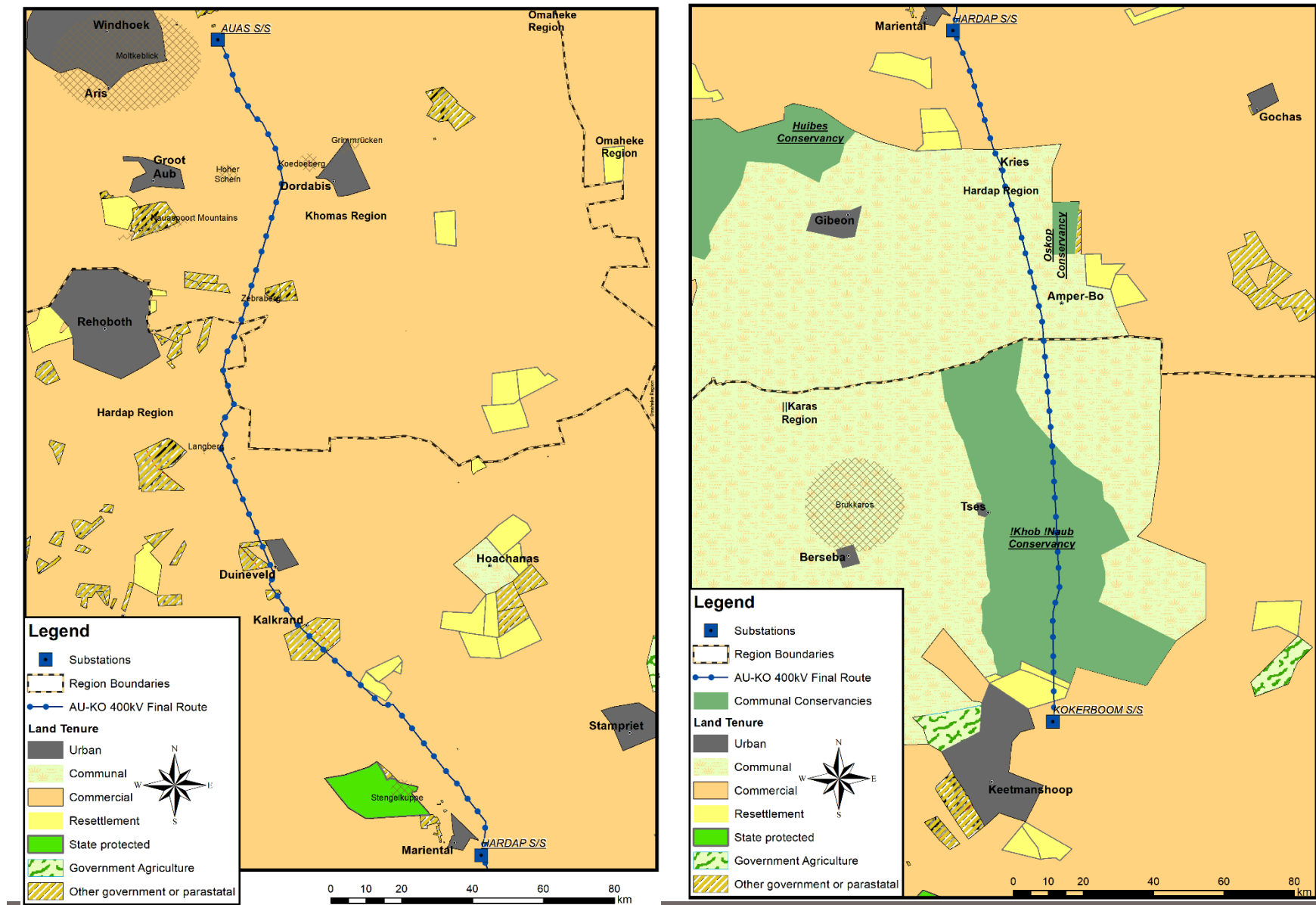


Figure 5-11: Land tenure of land traversed by the proposed 400kV Transmission Line

6 OCCURRENCE OF INDIGENOUS PEOPLES IN THE STUDY AREA

6.1 INDIGENOUS PEOPLES REQUIREMENT IN ESS7

According to the World Bank ESS 7: indigenous peoples/sub-Saharan African historically Underserved traditional local Communities, the following criteria presented in Paragraphs 8 and 9 of the ESS, should be applied to identify whether such a group is present in or affected by a proposed project:

"8. In this ESS, the term "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" (or as they may be referred to in the national context using an alternative terminology) is used in a generic sense to refer exclusively to a distinct social and cultural group possessing the following characteristics in varying degrees:

(a) Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; and

(b) Collective attachment to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; and

(c) Customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and

(d) A distinct language or dialect, often different from the official language or languages of the country or region in which they reside .

9 . This ESS also applies to communities or groups of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities who, during the lifetime of members of the community or group, have lost collective attachment to distinct habitats or ancestral territories in the project area, because of forced severance, conflict, government resettlement programs, dispossession of their land, natural disasters, or incorporation of such territories into an urban area .

One group in the study area namely the Nama, have some of the characteristics of the definition according to ESS7. This section is devoted to a background of this group's livelihood strategies, culture, political situation and sensitivities.

6.2 THE NAMA IDENTITY ACCORDING TO THE NAMIBIAN GOVERNMENT AND ESS7

Namibia has at least 11 main ethnic groups, numerous subgroups and 12 languages for national educational instruction. The Government of the Republic Namibia (GRN) does not recognise the term “indigenous peoples” as commonly defined in international law or under the World Bank’s ESS7. In common with a number of African states, GRN considers all “formerly disadvantaged” Namibians, i.e., those of non-European descent, to be indigenous – though the term indigenous peoples is applied by GRN in some international processes and documents.

GRN uses the term “Marginalized Communities” for three groups that meet the ESS7 criteria in Namibia (the San, Ovahimba and Ovahimba), though this is a socio-economic criterion and hence not analogous with the concept of indigenous peoples or application of ESS7. At least another three groups in Namibia meet the ESS7 criteria—the Ovahimba, Ovazemba and Nama—but these have no specific recognition by GRN. For the purposes of this ESIA, the term *Traditional Local Communities* is used to refer to groups under ESS7 criteria relevant to this project.

Traditional Local Communities in the project area include the Nama, (a Khoekhoe or Khoi group) who are related to the hunter-gatherer San groups and have occupied areas of southern Africa for thousands of years. The Nama are likely descended from similar groups as the San, but who became semi-nomadic pastoralists as livestock infiltrated in southern Africa, perhaps as long as several thousand years ago. Nama groups historically lived north and south of the Orange River, which is now the southern border between Namibia and South Africa. The San (comprised of six different groups in Namibia alone) and the Nama can be considered among the oldest continuous inhabitants of Namibia, although generally the Nama are not as well known or discussed as the San.

Today, the Nama number approximately 70,000-100,000 in Namibia, and also live in South Africa and Botswana with much smaller populations. The Nama have at various national and regional meetings self-identified as indigenous peoples, and are referred to as indigenous peoples in some international reports. Nama representatives serve on the Namibia Indigenous People's Advocacy Platform (NIPAP), a representative platform formed by the Indigenous Peoples of Africa Co-ordinating Committee (IPACC).

The Nama have a reasonable amount of political representation, including some high-level politicians and 9 recognised Nama-speaking Traditional Authorities, under a Nama Traditional Leaders Association (NTLA). They also have strong attachment to their traditional lands, which at times has been a controversial issue in southern Namibia due to their historical dispossession of land under German colonial rule. For example, the Nama and Herero are the main parties in the Genocide compensation negotiations with Germany, and this and related issues have resulted in the formation of a political party, the Landless People's Movement (LPM).

6.3 TRIBES AND DISTRIBUTION

There are various Nama tribes in Namibia, each with their own name. During the 19th century, most Nama tribes developed permanent centres where the chief resided and the tribal government (i.e., traditional authority) was established. Each tribe has a council, led by mature men, which is led by a chief. The most distinctive features of the tribe are the existence of a political community differentiating itself from other groups, being recognised as a separate entity by outsiders, and manifesting itself in strong loyalty towards their chief and council.

According to Mendelsohn et al, (2002)²⁴, it is clear that the study area is occupied by a mixture of Nama people from the Rooinasie and Witboois tribes North of Mariental, and the Witboois, and Bondelswarts Nama tribes between Mariental and Keetmanshoop. The larger towns such as Mariental and Keetmanshoop are occupied by a mixture of all the people groups of Namibia.

6.4 LIVELIHOODS

The traditional subsistence form of the Nama is based on stock-farming, supplemented by hunting and gathering. Water, pasture, hunting area, grazing, and veld food (food from the natural surrounds) are regarded as the most important natural resources. The staple food of the Nama is meat and milk, supplemented by veld food. The emphasis is on keeping sheep and goats.

Communal land ownership prevails in the area between Mariental and Keetmanshoop, but with the present sedentary form of living, and the depletion of veld food sources, this has changed significantly. Communal agricultural schemes have been introduced at Gibeon and many Nama's have turned to the labour market for work on farms, in towns and cities in order to secure a living (Malan, 1995²⁵).

Traditional beehive Nama huts, made of rush-mat are rarely still seen today, and mostly sacking, plastic, canvas, galvanised iron is used to cover the structures.

The Nama people are known for crafts which include leatherwork, animal skin and mats, musical instruments (such as reed flutes), jewellery, clay pots, and tortoiseshell powder containers.

6.5 CULTURE

Malan (1995) describes that social gatherings are very important to the Nama. The fire is the central pivot of social interaction, where stories are told, music is played and dances

²⁴ Mendelsohn et. al. Atlas of Namibia, A Portrait of the Land and its People. MET. 2002.

²⁵ J.S. Malan. 1995. Peoples of Namibia. Department of Anthropology. University of the North. Rhino Publishers.

are performed. Many of their practices, however, such as the traditional Nama marriage ceremony, have been replaced with more western cultural ways.

There appears to be a recent strengthening of Nama activities around culture, traditional knowledge and language, with various community festivals and meetings held in the recent past. The Nama language, Khoekhoegowab, is a click consonant language (also spoken by the Damara people in Namibia) that is widely spoken in Nama communities in Namibia and a language of school instruction.

Figure 6-1 shows the distribution of the Khoekhoe people speaking the Khoekhoegowab in Namibia, including the Nama. It is clear from the map that the Nama people reside in the entire study area between Windhoek and Keetmanshoop.

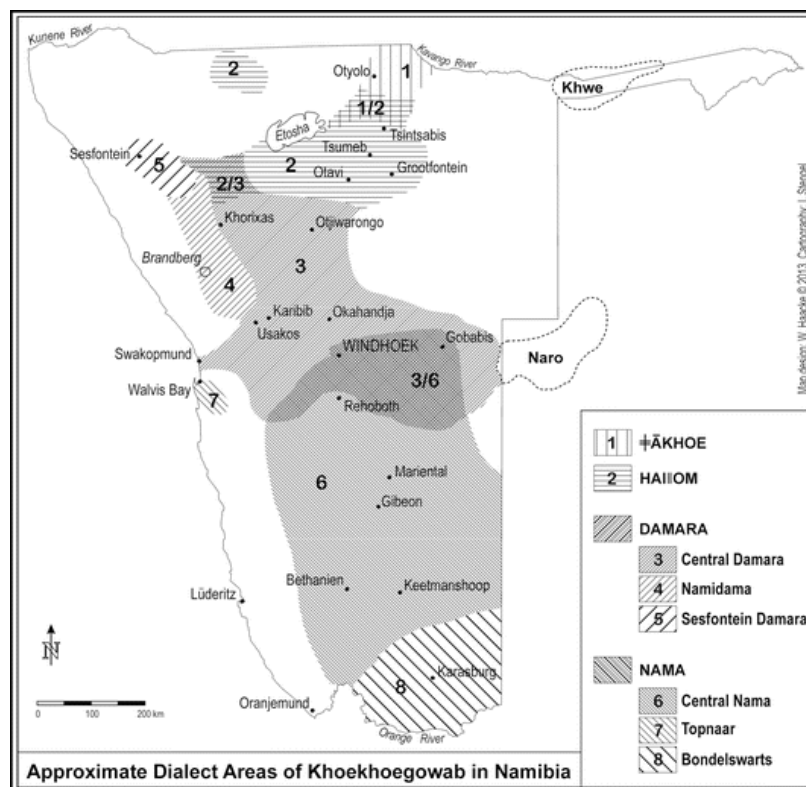


Figure 6-1: Distribution of Nama people in the study area, compared to other Khoekhoe people using the Khoekhoegowab language

6.6 NAMA SETTLEMENT PATTERNS AND DENSITIES IN THE STUDY AREA

It should be recognised that the Nama are settled with other people groups throughout the study area. However, the main official communal area of the Nama people in the

study area is shown in **Figure 5-11**, and includes the majority of land between Mariental and Keetmanshoop.

Figure 6-2 shows the settlements in the study area. The Atlas of Namibia (Mendelsohn et al, 2012) indicates that population densities between settlements are very low, at 0-1 people per km², owing to the sparse availability of resources. The current Nama lifestyle, which has shifted from the more traditional patterns, is to settle at the villages, towns and settlements shown on the map, and have herds of small livestock, with a herder shepherding the flock in the countryside. Therefore, structures in the communal area beyond the villages include kraals, watering points, and small traditional huts mostly used by the herders. The power line servitude avoids all these structures.

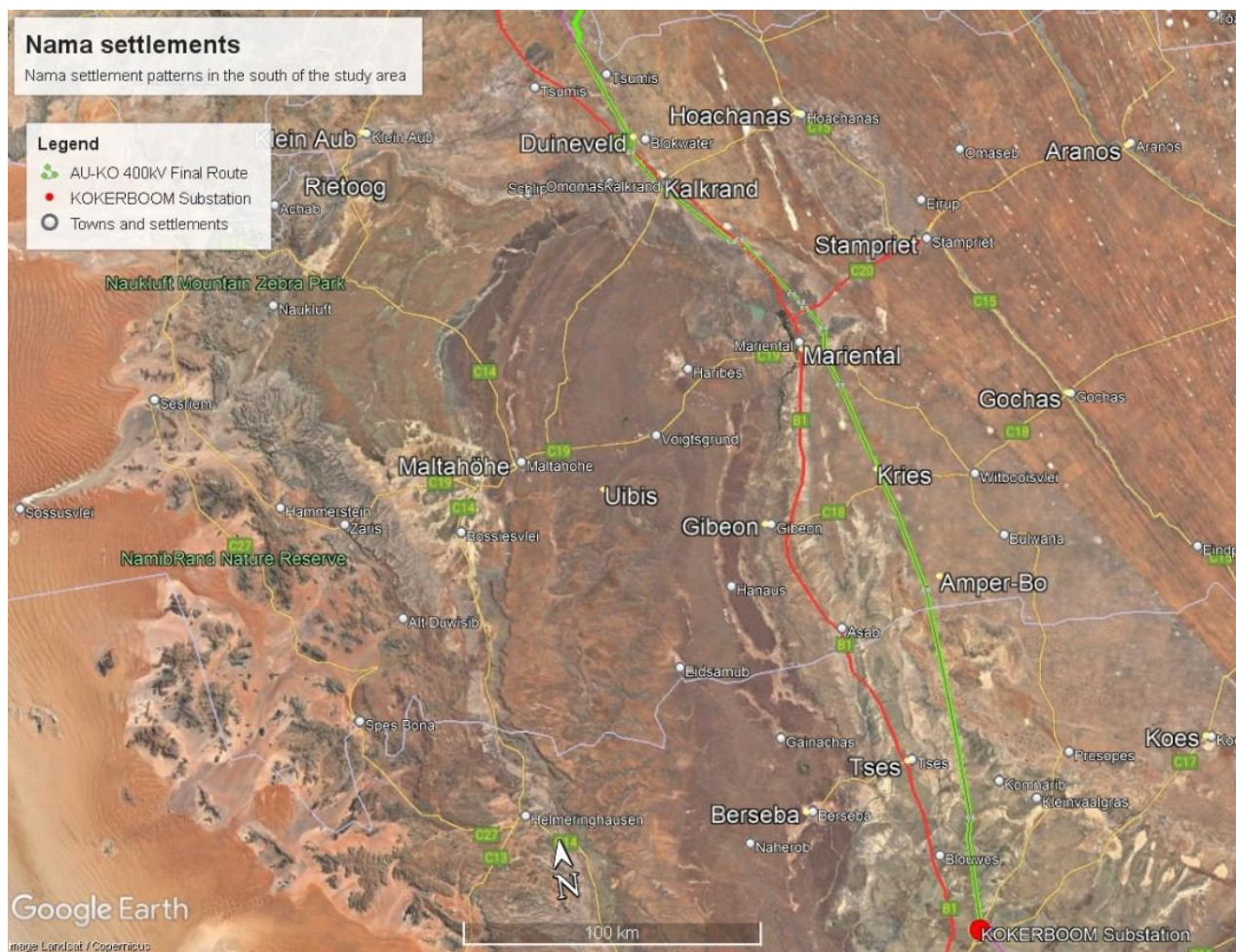


Figure 6-2: Google earth image, showing settlements in the study area including the communal land between Mariental and Keetmanshoop.

From the map it is clear that the larger settlements are also avoided by the proposed power line, except at Kriess (**Figure 6-3** below). The existing 220kV line (pink) is too close to the village to fit the new 400kV line in without affecting structures in the village.

Therefore the new 400kV route was deviated further east around the village. The village is now 250m away from the servitude's edge at the closest point.



Figure 6-3: Details at Kriess Settlement

6.7 THE !KHOB !NAUB CONSERVANCY

The !Khub !Naub Conservancy is a self-governed conservancy (**Figure 6-2**) within the Nama communal area. The conservancy is a legal entity registered in terms of the Namibian Parks and Wildlife Act. This conservancy is governed by a Management Committee of four women and five men with seven volunteer Community Game Guards.

The Ministry of Environment, Forestry and Tourism issues annual quotas based on the health of wildlife populations in each conservancy. Annual reports²⁶ indicate that an annual quota for 50 hunting permits for Springbuck is normally issued for use in this particular conservancy. In 2022, 13 of the 50 permits were utilised and in 2021, 40 of the 50 permits were utilised.

²⁶ https://www.nacso.org.na/sites/default/files/Khub_Naub%20Audit%20Report%202022.pdf

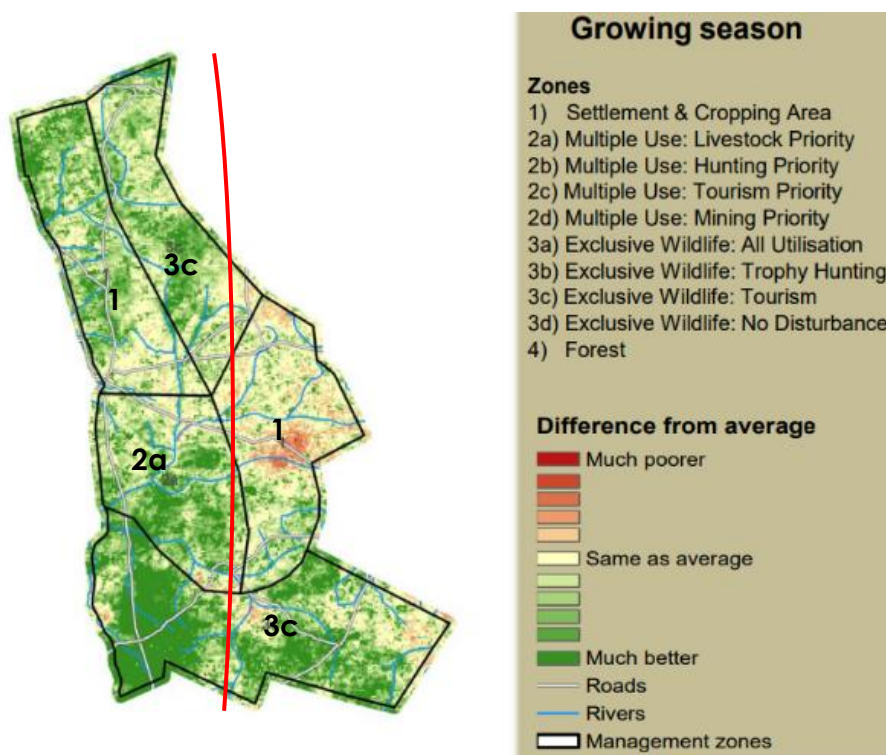


Figure 6-4: The !Khob !Naub Conservancy Management Plan showing vegetation cover in 2021, red line roughly indicates proposed transmission line corridor (Source: NACSO, 2021).

Figure 6-4²⁷ shows the management zones of the conservancy and indicates the areas where settlement, cropping, livestock and hunting and tourism takes place.

It has already been shown above that the proposed servitude is far removed from any homesteads or settlements. Due to the vast size of the conservancy (2427km²), compared to the small strip of the proposed servitude passing through, construction activities will have a minimal and temporary effect (maximum three months). Very little of the low shrubs and grasses will be removed (only for the 12m two-spoor maintenance track) and grazing impact will therefore be minimal.

The servitude does cross the hunting zones, as shown on the figure (zones marked 3c). However, hunting activities in the area are limited to Springbok only. Hunting permits for other antelope such as Kudu, Steenbok, Gemsbok, and Klipspringer, are currently not issued due to their very low numbers.

²⁷ <https://www.nacso.org.na/conservancies/khob-naub>

7 CRITICAL HABITAT ASSESSMENT

To meet the objectives of the Environmental and Social Standards (ESS) 6, it is crucial to know whether the habitat present is considered modified or natural and whether either of these, or elements within are classified as critical habitat. If residual impacts on either natural or critical habitat are significant, the applicant is required to implement biodiversity offsets. This chapter aims to determine whether any of the habitat present is classified as critical.

According to ESS 6 habitat is defined "as a terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment". The standard further divides habitats into three groups namely:

- **Modified Habitats:** "areas that contain a large proportion of plant and/or animal species of non-native origin and/or where human activity has modified an area's primary ecological function and species condition". However, these modified habitats may still contain significant biodiversity value.
- **Natural habitats:** "areas composed of viable assemblages of plant and/or animal species of largely native origin and/or where human activity has not essentially modified an area's primary ecological function and species composition".
- **Critical Habitats:** "areas with high biodiversity value including the following criteria:
 - i. Habitat of significant importance to Critically Endangered and/or Endangered species as listed in the IUCN Red List of threatened species or equivalent national approaches;
 - ii. Habitat of significant importance to endemic and/or restricted-range species;
 - iii. Habitat supporting globally significant concentrations of migratory species and/or congregatory species;
 - iv. Highly threatened and/or unique ecosystems; and/or
 - v. Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (i) to (iv).

A habitat is either defined as Natural or Modified habitat based on the definitions listed above. These two habitat types can be further classified as Critical Natural Habitat or Critical Modified Habitat.

ESS 6 stipulates certain conditions that are applicable to developments that are proposed for areas designated as either natural or critical habitat, and for areas of modified habitat that are of significant biodiversity importance. With respect to the latter, the requirement is that impacts on biodiversity should be minimized and that appropriate mitigation measures are implemented.

Habitat assessments must be based on *"an ecologically appropriate area of analysis to determine the presence of critical habitat for each species with regular occurrence in*

the project's area of influence, or ecosystem", the scale of which is not limited to the footprint of the proposed project, but rather the species of concern. Because the species of concern include mainly avifauna and their habitats, the affected area was considered in its broader sense. Nevertheless, a block of approximately 200km wide, ranging from 60-100km from the servitude (Figure 7-1) was considered for the assessment of Critical habitat, referred to as the Area of Analysis (CHAA).

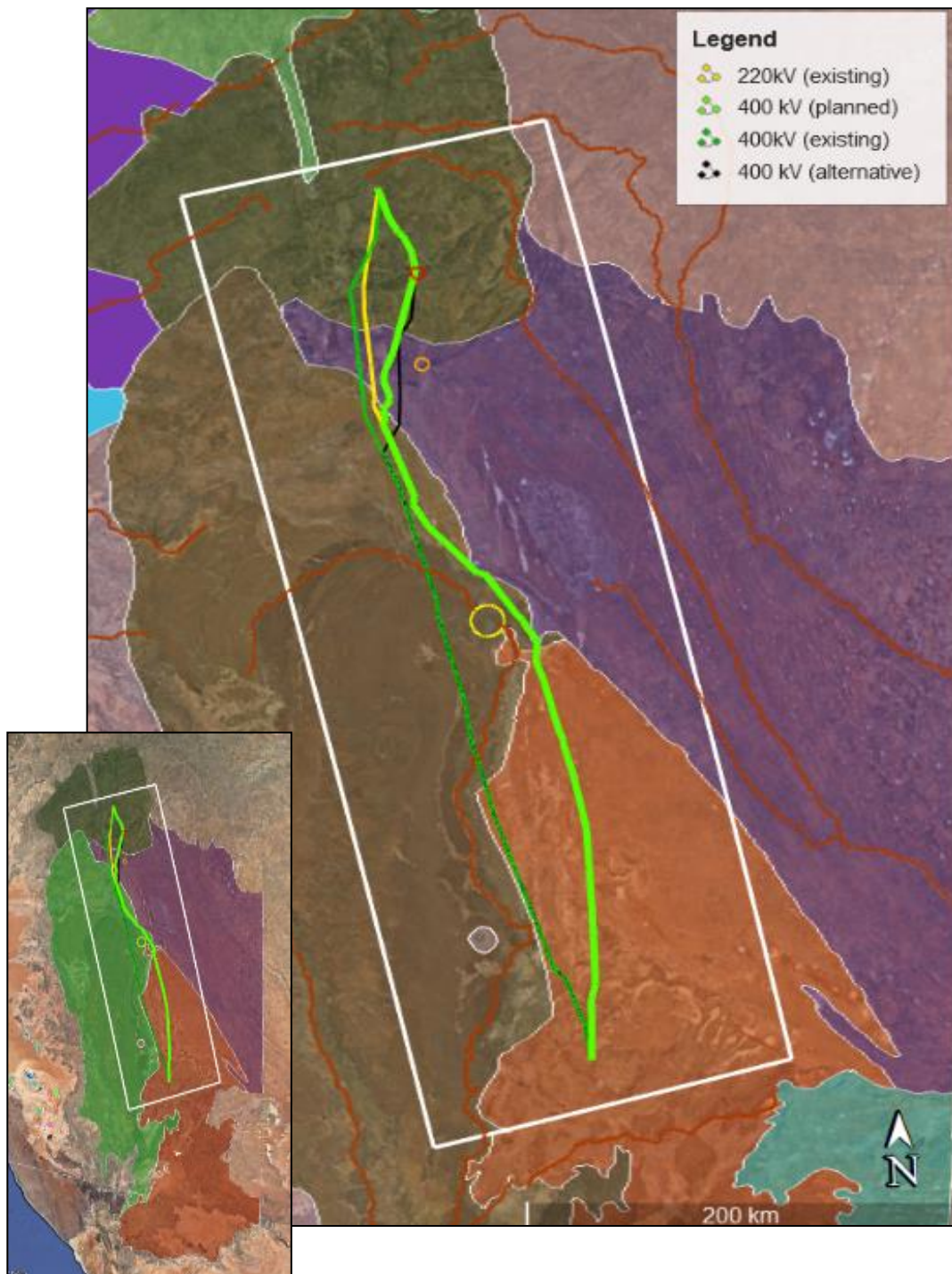


Figure 7-1 Detail of focal study area or Critical Habitat Area of Analysis (CHAA) as indicated, arbitrarily, on average around 60-100 km from either side of the planned and alternative power line servitudes (white polygon); vegetation types/habitats through which the two routes run are also indicated (red-brown = Karas Dwarf Shrubland; dark brown = Dwarf Shrub Savanna; purple = Southern Kalahari; dark green = Highland Shrubland; inset shows extent of each vegetation type, in Namibia), as well as potentially sensitive avifauna habitats/features (orange circle = White-backed Vulture breeding area; red circle = Verreaux's Eagle breeding area; yellow circle = Hardap Nature Reserve IBA; brown lines = ephemeral rivers) (based on a Google Earth image; EIS 2023 in Ecoserve, 2023).

7.1 BIODIVERSITY SCREENING FOR CRITICAL HABITAT

To assess the criteria for critical habitat, biodiversity features within the CHAA (Critical Habitat Area of Analysis) were screened for landscape level and localised habitat, ecosystem and species level, using a desktop assessment and information from the specialist studies undertaken for the Environmental and Social Impact Assessment. **Table 7-1** lists the ESS criteria and the levels of scale at which each are considered.

Table 7-1: ESS 6 Criteria for determining Critical Habitat

Assessment level	Criteria	Triggers
Species level	Criteria 1	Habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches.
	Criteria 2	Habitat of significant importance to endemic or restricted-range species
	Criteria 3	Habitat supporting globally or nationally significant concentrations of migratory or congregatory species
Localised habitat/ecosystem level	Criteria 4	Highly threatened or unique ecosystems
Habitat at landscape level	Criteria 5	Ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (4) to (1)

For the purpose of this assessment, the broader systems in the landscape, i.e. the habitats, are considered first, with the other criteria following in sequence.

7.1.1 Criteria 5 Ecological functions or characteristics that are needed to maintain the viability of the biodiversity described in Criteria 2-4.

This section describes characteristics and functions of the habitats and landscapes in the CHAA, which are needed to support the ecosystems and species occurring in it.

7.1.1.1 Condition of habitat

ESS6 covers all habitats, categorized as "modified habitat", "natural habitat" and "Critical Habitat", along with "legally protected and internationally and regionally recognized areas of biodiversity value", which may encompass habitat in any or all of these categories.

The majority of the CHAA (Critical Habitat Area of Analysis) is considered **natural habitat**. Although the construction of existing infrastructure, including power lines and roads, has to some extent made changes to the natural habitat, this infrastructure was not placed in the category of modified habitat because the surrounding areas consist largely of intact, natural habitats. Human activity has therefore not substantially modified the area's primary ecological functions and species composition (ESF Guidance Note 19).

Furthermore, most of the proposed transmission line corridor is deemed to qualify as natural habitat because, according to the ESS6 criteria, it is home to plant and animal species mainly of native/indigenous/ non-alien origin. The primary ecological function and species composition of the area therefore remains unchanged. Human activities in these habitats centre on livestock grazing (sheep and goats), which has taken place over the long term. The character and functions of the habitat thus remain essentially natural (ESF Guidance Note 19.1).

Pockets and linear corridors of **modified habitat** exist within the overall natural habitat, and these include the service road of the existing 220kV transmission line, the B1 National Road, the homesteads existing on the commercial farms, and settlements, including Keetmanshoop, Tses, Gibeon, Mariental, Kalkrand, Rehoboth and Windhoek.

7.1.1.2 Description of habitats

Table 7-2 below shows the summary of the vegetation zones identified in the CHAA, as well as their sensitivities and potential impacts related to the project activities.

Table 7-2: Habitat related sensitivities

HABITAT	SENSITIVITY
Dwarf Shrubland (Dwarf Shrub Savanna and Karas Dwarf Shrubland) with protected species in low densities and scattered across the habitat and concentrated around pans, river beds and outcrops.	Low
Pans, river beds and outcrops within these habitats have been avoided and mitigations prescribed in the BAP, that towers and construction works are to avoid these features.	

<p>Southern Kalahari with Mixed Tree and Shrub Savanna with dense stands of protected trees in some areas.</p> <p>The specific concern is <i>Vachellia erioloba</i>, which, together with other dense stands of protected trees, should be avoided during the placement of the towers.</p>	Medium to high
<p>Highland shrub savanna High levels of endemism and protected species.</p> <p>The current route mostly avoids the higher lying sensitive zones of this habitat (particularly the Auas Mountains south of Windhoek), rock outcrops and river beds, which sustain high concentrations of plant species of conservation concern.</p>	High

The higher lying areas of the Auas Mountains in the Highland Shrub Savanna is considered critical habitat, but is avoided by the route, which starts east of this mountain range and leads away from it in a southerly direction. The other habitats are widespread and their integrity is not under threat due to this project. Isolated habitats of importance within these broad-level landscapes are discussed below.

Criteria 5 is therefore is not triggered by any area affected by the project corridor.

7.1.2 Criteria 4 Highly threatened or unique ecosystems

Criterion 4 is triggered by ecosystems that are considered to be threatened or unique. These areas are defined as being "at risk of significantly decreasing in area or quality", areas that have a small spatial extent and/or areas that contain "unique assemblages of species including assemblages or concentrations of biome-restricted species".

Criterion 4 is also triggered if an area is determined to have a significant conservation value based on systematic conservation plans carried out by the government, recognised academic institutions and other organisations such as internationally recognised NGOs (e.g., WWF) as well as priority areas identified in regional and national plans of Namibia.

Triggers a) Areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN and b) Other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

7.1.2.1 *Legally protected and internationally and regionally recognized areas of biodiversity value*

The **Hardap Game Reserve (Hardap Recreational Area)**, a protected area (National Park) in terms of Namibian legislation. It is, however, designated as such, for recreational purposes, but not considered sensitive from a biodiversity point of view, besides from an avifauna perspective (discussed in the avifauna section below, Criterion 3). The reserve in question is not directly traversed by the transmission line, but skirted by approximately 10 km by the route.

The **!Khob !Naub Conservancy (Figure 5-11)**, to the south of the study area, has wildlife populations for which hunting permits are issued by the Ministry of Environment, Forestry and Tourism, administered by its appointed conservancy committee. This serves as an income for the local population. Conversations with the committee members have indicated that the transmission line will not be a threat to these wildlife populations since it is aligned 1) adjacent to the existing 220 kV transmission line, away from the more remote areas where hunting is carried out; and 2) habitat modification will be very limited, and grazing can continue once the line is operational. Furthermore, the wildlife occurring there (Gemsbok (LC), Springbok (LC), Klipspringer(LC), Steenbok (LC), Greater Kudu (LC) occur widespread and are not on the IUCN Red List. Therefore, the presence of this conservancy does not trigger any of the ESS6 categories.

7.1.2.2 *Unique or threatened ecosystems*

Sensitive avifauna and vegetation "hotspots" within the above habitat categories are outlined below (also see **Figure 7-1** for localities):

- Dwarf Shrub Savanna: the Hardap Game Park is a nationally protected area (244 km², with 260 bird spp.), and includes the Hardap Dam, also overlapping with the Hardap Nature Reserve Important Bird Area (IBA). Even though the power line route does not traverse this site, the relevant sections of power line passing the area should be marked with bird diverters and monitored for bird interactions, as a priority.
- Southern Kalahari: a sensitive bird "hotspot" lies 15 km east of the power line, with White-backed Vulture breeding area/congregatory area (50-100 birds + nests) and bustard habitat; this sensitivity has already been avoided/mitigated by re-routing the power line. Marking of the power line and monitoring at this site is recommended.
- Highland Shrubland: the planned power line will pass through a narrow mountain pass (Nauaspoort), which supports vegetation of Namibian conservation concern,

and two nests of Verreaux's Eagle. The route is 1.1km away from the site, and should be marked at this site, and monitored.

- Areas along the route east of Tsumis (**Figure 5-5**), as well as the southern parts of Section C and the portion south and north of Bend Point 4 (P4 on **Figure 5-5**). These areas contain dense populations of *Vachellia erioloba*. Other scattered dense stands of *Vachellia erioloba* can be found in sections B and C, which should be regarded as sensitive, although widespread and thus difficult to define.
- Slopes of small hills and mountains in the Highland Savanna (Section C) carry numerous species of concern (see Highland Savanna discussed under Error! Reference source not found.). At present these habitats of concern are largely avoided by the proposed route, therefore it is anticipated that the vegetation is not likely be significantly affected by the proposed project.
- Pan verges, riverbanks and drainage lines that harbour higher than average numbers and sizes of protected woody species, as well as sedges. Pans occur in the dwarf shrub habitats, while riverbanks and drainage lines occur throughout the CHAA.
- Dense stands of *Aloe dichotoma*, although rare, may be encountered in the southernmost extent of the route, and should be avoided, when the detailed survey is conducted for the positioning of the towers. They do not, however, occur in one specific ecosystem or location.

These habitats, and areas identified are important for specific management actions in the Biodiversity Management Plan, but none of them qualify on their own as Critical Habitat. The exception is the Dwarf Shrub Savanna and the IBA at the Hardap Dam, which are further discussed in the sections below.

7.1.3 Criterion 3 Habitat supporting globally or nationally significant concentrations of migratory or congregatory species

Criteria 3 is triggered by habitat supporting the presence of either migratory or congregatory species within the area of assessment. Migratory species are defined as “any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem). Congregatory species are defined as “species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis”. GN76 of the WB ESS 6 Guidance Notes gives examples of congregatory species as:

- Species that form colonies.

- Species that form colonies for breeding purposes and/or where large numbers of individuals of a species gather at the same time for non-breeding purposes (for example, foraging and roosting).
- Species that utilize a bottleneck site where significant numbers of individuals of a species occur in a concentrated period of time (for example, for migration).
- Species with large but clumped distributions where a large number of individuals may be concentrated in a single or a few sites while the rest of the species is largely dispersed (for example, wildebeest distributions).
- Source populations where certain sites hold populations of species that make an inordinate contribution to recruitment of the species elsewhere (especially important for marine species).

Migratory bird species use a number of habitats across geographic ranges that extend beyond their breeding territory and national boundaries (African-Eurasian Migratory Landbirds Action Plan, 2014).

This network of habitats used by these species are important to their survival, as the loss or degradation of important habitat units can affect the population as a whole.

Declines in population numbers of migratory bird species can be explained by changes in productivity in breeding areas, or refuelling sites, during their migration, or as a result of changes in habitat or food availability in their non-breeding areas. The African-Eurasian Migratory Landbirds Action Plan (2014) recommends the conservation of these species' flyways to ensure their survival.

Priority sites that require conservation for migratory species include *"migratory staging areas (i.e., resting and feeding areas), congregatory roosting areas, breeding sites where nesting birds are concentrated, sites on migratory routes where large numbers congregate in certain seasons, and protected areas within a landscape of otherwise unsuitable habitat"*.

Congregatory and migratory avifauna species identified in the CHAA that are likely to be impacted by the project, are listed in **Table 7-3** below.

The Hardap Dam site is considered an important site for the congregatory species Great White Pelican. The transmission line has been routed away from this site and marking of the line in this area will be an important mitigation near this site. Monitoring at this site is prescribed in the preliminary BMP will be updated during the preparation of the BMP according to the Plan of Study contained in the biodiversity and critical habitat assessment report. The route also considered breeding sites of three species of vultures and was rerouted to avoid these sites where possible. One breeding site of white-backed vulture remains in the vicinity of the transmission line route. Markings need to be applied to the line near the site, and monitoring carried out as set out in the BMP to be prepared for this project.

7.1.4 Criterion 2 Habitat of significance to Endemic and Restricted Range Species

Criterion 2 is triggered if the CHAA is a habitat of significant importance for species that are either endemic or have restricted ranges.

7.1.4.1 Vegetation species

Table 5-1 contains a list of vegetation species of conservation concern which are expected to occur along the power line route. All species, except one listed are widespread and not endemic to Namibia, according to the above criterion.

Cyperus rehmi is an endemic species and has only been collected on two farms in the CHAA, in highland savanna, but the transmission line does not traverse these farms. The species occurs in pans and seasonally wet areas. These habitats are avoided by the transmission line and it is therefore unlikely that the species occurring in these habitats will be affected significantly.

There are therefore no vegetation species which trigger Criterion 2 and therefore no habitats which support endemic or restricted range plant species in the CHAA.

7.1.4.2 Avifauna species

As may be seen in **Table 7-3** below, Criteria 2 is not triggered by any of the avifauna species or the habitats which support them. Some species, including Violet Wood-Hoopoe, Rüppell's Parrot, Damara Hornbill, and Monteiro's Hornbill are near endemic to Namibia, however not considered of conservation concern. These species are not prone to collisions with power lines, although their habitats need to be protected from destruction. Important habitat is rocky areas, river beds and open grass and shrubland. Rocky areas and river beds will not be affected by the project to a significant extent and grasslands will be affected to a limited extent, if habitat loss is restricted according to the ESMP. Forty Percent of the Ludwig's Bustard population occurs in Namibia, and therefore has a large population in the country, but does not trigger Criterion 2.

7.1.5 Criterion 1: Habitat of significant importance to Critically Endangered and Endangered Species

Criterion 1 is triggered by the presence of significant habitat which supports species listed as Critically Endangered (CR) or Endangered (EN) on the International Union for Conservation of Nature (IUCN) Red List. Species that on the Namibian CR and EN list should also be considered and where the lists vary, the precautionary approach should be followed.

A list of CR and EN species with distribution ranges that overlap with the CHAA was generated using the IUCN database, and species lists from the baseline studies (vegetation and avifauna studies) conducted as part of the ESIA.

7.1.5.1 Vegetation species

None of the vegetation species which are known or expected to occur in the CHAA, are triggered by Criterion 1. There are no known critically endangered or endangered vegetation species occurring in the CHAA.

7.1.5.2 Avifauna species

Table 7-3 below shows the CR and EN Namibian and globally listed species.

The avifauna species, which are Critically Endangered or Endangered according to the Namibian and IUCN Red lists are White Backed Vulture, Cape Vulture, Lappet Faced Culture, Black Harrier, Martial Eagle, Booted Eagle, Tawny Eagle, Secretary Bird, Ludwigs Bustard, Black Stork and Violet Wood Hoophoe.

Of these, the habitat of the Ludwig's Bustard has been assessed to meet Criteria 1, since it is classified as Globally Endangered and Endangered in Namibia. The species is highly prone to power line collisions, and the sparse grasslands which is its preferred habitat, is of critical habitat, that is, of high significance to support the species.

The habitat is widespread, however, at a regional level, the existing cumulative impact of power lines on this species in open grassland (savanna habitats), is of significant concern.

7.2 CONCLUSION: CRITICAL HABITAT

It could be concluded from the Critical Habitat Assessment, that given all the criteria combined, the Karas Dwarf Shrubland and Dwarf Shrub Savanna are considered critical

habitat. The **Ludwig's Bustard**, which is classified as Globally Endangered, according to the IUCN Red Data list of species and listed as Endangered on the Namibian Red List, prefers open grassland areas such as those found in the mentioned habitats. Relatively high frequencies of power line collisions for bustards have been reported in Namibia, and in particular the recorded collision data indicates a high incidence of Ludwig Bustard collisions, predominantly in the south of the line near Keetmanshoop (Kokerboom Substation), in addition to Mariental and Kalkrand (Ecoserve, 2023). Within these habitats, the Hardap Dam is also an Important Bird Area and an important area for migratory species, the Great White Pelican. Even though the dam is some 10km to the west of the proposed route, birds in this habitat may be affected by the power line.

Even though these habitats are considered important habitats for Ludwig's Bustard, and other mentioned species, the range of the habitats' availability in Namibia and the region is considered relatively large. The impact of the proposed transmission line on the integrity of the habitat, per se, is considered to be site-specific, and minimal (limited habitat loss/destruction), and it therefore poses a very low threat to the overall population of the bustard species. It is rather the presence of the power line as a physical barrier in the habitat, which poses the threat in terms of potential collisions, that needs to be addressed more intentionally.

Table 7-3: Avifauna species of conservation concern triggering Ess6 Criteria 1-3 in the CHAA (Africa Conservation Services, 2023).

KEY:

Local abundance C = common; U = uncommon; R = rare

Red Data status CR = Critically Endangered, EN = Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern/Secure; G = global status; rare = now rare in Namibia

End = Endemism Green NE = near endemic; Nam = Namibia (≥90% of population in Namibia); s Afr = southern Africa;

Residency: Congregatory (con; brown) and migratory (mig; blue) species; par migrant = partial migrant; Pal mig = Palearctic migrant; intra-Afr = intra-African

Other conservation factors: G = global, N = Namibian; CHAA = Area of Analysis (study area); > = decreasing, < = increasing

BIRD SPECIES	Local abundance ⁴ in vegetation type				Bird species status cf. Criteria 1-3 for Critical Habitat			Other conservation factors				
	1. Karas Dwarf Shrubland	2. Dwarf Shrub Savanna	3. Southern Kalahari	4. Highland Shrubland	1. Critically Endangered & Endangered spp. ^{2,3}	2. Endemic & restricted- range spp.	3. Migratory & congregatory spp.	Area of occurrence / extent of occupancy (km ²)	Population estimates	Population trends	Power line collision incidents (Nam + CHAA) ⁵	Habitat preferences and sensitivity
White-backed Vulture	U	U	C	U	G CR, N CR		Con (colonial)	G 2,340,000 N 305,000 (13%)	G (Africa) 270,000 (1992) N ~10,000	G > N >	N v CHAA v (4)	Dry, woodland savannah; resident, widespread movements. 3. Sensitive breeding area/ congregatory area (50-100 vultures + nests)

BIRD SPECIES	Local abundance ⁴ in vegetation type				Bird species status cf. Criteria 1-3 for Critical Habitat			Other conservation factors				
	1. Karas Dwarf Shrubland	2. Dwarf Shrub Savanna	3. Southern Kalahari	4. Highland Shrubland	1. Critically Endangered & Endangered spp. ^{2,3}	2. Endemic & restricted- range spp.	3. Migratory & congregatory spp.	Area of occurrence / extent of occupancy (km ²)	Population estimates	Population trends	Power line collision incidents (Nam + CHAA) ⁵	Habitat preferences and sensitivity
Cape Vulture	-	R	-	-	G VU, N CR	SA NE N <1%	(Con [colonial])	G 1,250,000 N 61,000	G 9,600- 12,800/3,000 prs N <20?	G > N long term >	N – CHAA –	Mountains, inselbergs, forages over open grassland within savannah woodland; resident with long-distance movements; no breeding in study area
Lappet-faced Vulture	R	R	C	U	G EN, N EN		Con	G 34,200,000 N 335,200	G 6,500 / 8,000 (Africa 1992) N 500 prs / 1,350 birds	G > N >10%	N V CHAA V (1)	Arid savannah through to desert watercourses; resident with long- distance movements
Black Harrier	-	R	-	R	G EN, N EN	SA END N 5%		G 1,340,000 N 23,000	G 251-999 / <1000 N <50 birds / 5 prs	G > N fluc	N – CHAA –	Desert floodplains, karroid scrub; seasonal movements into s Kalahari and c Namibia
Martial Eagle	U	U	U	R	G EN, N EN			G 26,000,000 N 243,000	G Tens of thousands (2001) / SA <600 prs / 1,620 birds N <350 prs / 945 birds	G > N >	N – CHAA –	Grasslands, Namib, Karoo and wooded savannahs; resident
Booted Eagle	R	U	-	-	G LC, N EN		Pal mig pop (and non-	G 62,000,000 N 109,000	G 150,000- 195,000 N 250 birds/ 20 prs	G ?Stable N Fluc	CHAA	Mountains, inselbergs (migrant + breeding populations in Namibia)

BIRD SPECIES	Local abundance ⁴ in vegetation type				Bird species status cf. Criteria 1-3 for Critical Habitat			Other conservation factors				
	1. Karas Dwarf Shrubland	2. Dwarf Shrub Savanna	3. Southern Kalahari	4. Highland Shrubland	1. Critically Endangered & Endangered spp. ^{2,3}	2. Endemic & restricted- range spp.	3. Migratory & congregatory spp.	Area of occurrence / extent of occupancy (km ²)	Population estimates	Population trends	Power line collision incidents (Nam + CHAA) ⁵	Habitat preferences and sensitivity
							breeding SA mig)					
Tawny Eagle	-	R	R	U	G VU, N EN			G 52,700,000 N 237,400	G 100,000- 499,999 N 1,500 birds / 530 prs	G > N > 63%	N – CHAA √ (2)	Mopane, Kalahari and arid savannah woodlands; resident
Verreaux's Eagle	C	U	-	U	G LC, N NT			G 21,600,000 N 630,000	G Tens of thousands N 500-1,000 prs = 1,350-2,700	G stable N Fluc/ slight >	N – CHAA –	Nama Karoo and arid savannahs with escarpments and broken, rocky mountainous terrain. 4. Sensitive breeding site on cliffs (2 nests); resident
Secretarybird	U	R	U	U	G EN, N VU			G 23,200,000 N 226,000	G 6,700-67,000 N <1,500 prs / 4,050 birds	G > N >	N √ CHAA √ (1, 2, 4)	Open grassland, open savannah woodland, karoo shrubland; resident/ nomadic
Ludwig's Bustard	R	U	-	-	G EN, N EN	SA NE N 40%	Par mig (Con)	G 1,630,000 N 342,000	G 114,000 (2015) 56,000-81,000 (Nam/SA 1994)	G > N ?, >	N √ CHAA √ (Habi- tats 1, 2, 3, 4)	Open, sparse grassland; semi-arid dwarf shrublands of succulent Karoo, Nama Karoo & Namib (rainfall <500 mm)

BIRD SPECIES	Local abundance ⁴ in vegetation type				Bird species status cf. Criteria 1-3 for Critical Habitat			Other conservation factors				
	1. Karas Dwarf Shrubland	2. Dwarf Shrub Savanna	3. Southern Kalahari	4. Highland Shrubland	1. Critically Endangered & Endangered spp. ^{2,3}	2. Endemic & restricted- range spp.	3. Migratory & congregatory spp.	Area of occurrence / extent of occupancy (km ²)	Population estimates	Population trends	Power line collision incidents (Nam + CHAA) ⁵	Habitat preferences and sensitivity
Kori Bustard	C	U	-	R	G NT, N NT		(Con: males in br season)	G 8,800,000 / (sAfr) N 721,000	G? 2,000-5,000 (SA)/ (sAfr) N 5,000-10,000	G ? N ? >	N v CHAA v (Habitats 1, 2, 3, 4)	Open, sparse grassland with scattered trees (largely excluded from bush-encroached savannah); sedentary; males congregate for breeding; movements 150 km
⁶ Great White Pelican	-	C	-	-	G LC, N VU		Con (colonial)	G 51,200,000 N 90,300	G 265,000-295,000 N 3,000-4,000	G ? N > ?	N v CHAA –	Aquatic habitats, including inland dams 2. Hardap Dam and IBA; congregatory/ single mass breeding site, up to 50 nests – 1 of only 4 known breeding sites in Nam)
⁶ Black Stork	-	R	-	-	G LC, N EN		Pal mig	G 25,100,000 N 66,200	G 24,000-44,000 N 140 birds	G mod depleted N >	N – CHAA –	Perennial and ephemeral rivers, gorges and canyons, inland dams; est. 18 birds on Fish River; resident/nomadic
Violet Wood-Hoopoe	-	-	-	R	G LC, N EN	N NE 90%		G 3,810,000 N 36,000	G ? N 1,850/ 530 prs	G ? N stable to >	N – CHAA –	Escarpment rivers and surrounding arid savannah

BIRD SPECIES	Local abundance ⁴ in vegetation type				Bird species status cf. Criteria 1-3 for Critical Habitat			Other conservation factors				
	1. Karas Dwarf Shrubland	2. Dwarf Shrub Savanna	3. Southern Kalahari	4. Highland Shrubland	1. Critically Endangered & Endangered spp. ^{2,3}	2. Endemic & restricted- range spp.	3. Migratory & congregatory spp.	Area of occurrence / extent of occupancy (km ²)	Population estimates	Population trends	Power line collision incidents (Nam + CHAA) ⁵	Habitat preferences and sensitivity
Rüppell's Parrot		-	C	U	G LC, N NT	N NE 90%		G 170,000 N 140,000	G ? N 29,500 (13,000-46,000)	G ? N >?	N – CHAA –	Ephemeral rivers with large seed- bearing trees, highland areas, escarpment
Damara Hornbill	-	R	-	R	G LC, N LC	N NE 90%		G 414,000 N 268,000	G Widespread, locally common N (*newly described)	G ? N ?	N V CHAA –	Dry Acacia savannah to stony Mopane woodland habitat; large trees associated with ephemeral habitats
Monteiro's Hornbill	-	-	-	R	G LC, N LC	N NE 90%		G 559,000 N 224,800	G Widespread, locally common N 339,500	G ? N ?	N – CHAA –	Rocky habitat; nomadic

8 IMPACT ASSESSMENT

8.1 IDENTIFICATION OF KEY ISSUES

During the Scoping Stage of this project a screening process was applied whereby all potentially significant impacts were identified based on an understanding of existing environmental sensitivities, legal requirements as well as the concerns raised by I&APs. The process explained in **Figure 8-1** was then followed to screen the various potential impacts. Two groups of issues were identified:

- Issues that could be addressed in the ESMP (see **Appendix G** i.e. issues for which mitigation and management measures could already be identified during the Scoping Stage of this ESIA process and issues that do not fall within the scope of this study; and
- Issues that needed further specialist investigation i.e. issues for which sufficient information was not available to propose mitigation measures or assess the potential impact.

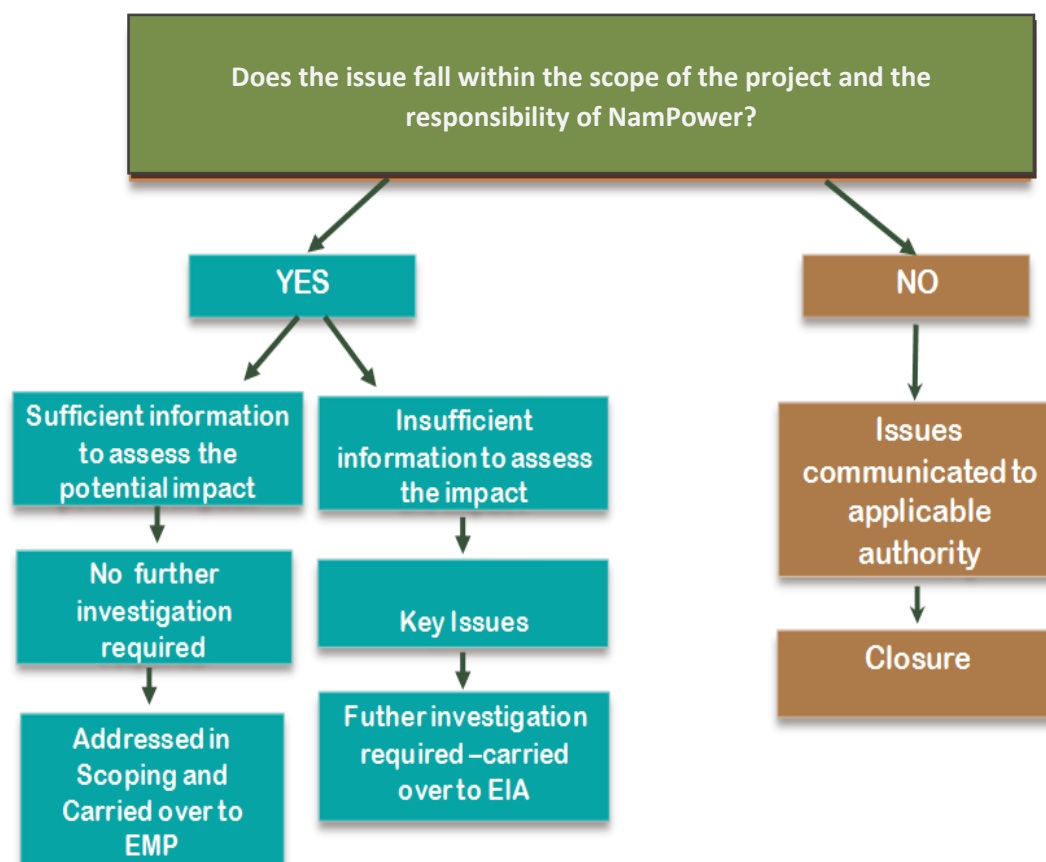


Figure 8-1: Screening process to determine key issues

Based on the screening process outlined above, five areas were identified as those which required further investigation in order to address the potential impacts. Specialists were therefore tasked to further investigate these areas:

- Impacts on vegetation
- Collision of birds with the power lines
- Impacts archaeological sites
- Social impact
- Flooding related impacts

During the 2023 update; this ESIA study; some further potential specialised sub-categories have been considered, as follows:

- ESS2 Labour and working conditions: legal requirements, occupational health and safety, requirements included in the ESMP
- ESS3 Resource Efficiency and Pollution Prevention and Management: included additional provisions in the ESMP
- ESS4 Community Health and Safety: Provisions in the ESMP
- ESS5 Land Acquisition, Restrictions on Land Use and Involuntary Resettlement: Abbreviated Resettlement Action Plan (ARAP)
- ESS6 Biodiversity Conservation and Sustainable Management of Living Natural Resources (Critical Habitat Assessments for birds and vegetation in terms of ESS6 (no further baseline work undertaken, screening species and habits in terms of Critical Habitat Criteria, Biodiversity Management Plan)
- ESS7 Indigenous peoples/sub-Saharan African historically Underserved traditional local Communities: screening the applicability of this ESS in Namibian context, provisions in the ESMP)

The findings from these investigations are summarised in and form the focus of the rest of this chapter.

Table 8-1: Summary of potential impacts addressed in this section

Specialist study	POTENTIAL IMPACTS OF THE PROJECT		
	CONSTRUCTION	OPERATION AND MAINTENANCE	DECOMMISSIONING
Vegetation	<ul style="list-style-type: none"> • Damage to vegetation particularly protected trees due to vehicle activity, clearing of vegetation, construction of pylons and construction laydown. 	<ul style="list-style-type: none"> • Damage to vegetation due to vehicle activity and illegal plant collection. 	<ul style="list-style-type: none"> • Disturbance or destruction of vegetation
Water demand, Flooding and erosion	<ul style="list-style-type: none"> • Erosion and flood risk along access paths and pylons bases • Impact on water resources due to water demand of the project 	<ul style="list-style-type: none"> • Erosion and flood risk along access paths and pylon bases 	<ul style="list-style-type: none"> • Erosion risk along access tracks and pylon bases
Waste management	<ul style="list-style-type: none"> • Degradation and contamination to the terrestrial environment. • Nuisance odours • Vermin and pests 	<ul style="list-style-type: none"> • Degradation and contamination to the terrestrial environment. 	<ul style="list-style-type: none"> • Degradation and contamination to the terrestrial environment.
Avi-fauna	<ul style="list-style-type: none"> • Habitat loss, disturbance associated with clearing of vegetation, traffic and other construction activities 	<ul style="list-style-type: none"> • Collisions with power lines and stay wires 	<ul style="list-style-type: none"> • Disturbance from traffic and noise
Archaeology	<ul style="list-style-type: none"> • Disturbance or destruction of existing archaeological sites 	<ul style="list-style-type: none"> • Disturbance or destruction of existing archaeological sites 	<ul style="list-style-type: none"> • Disturbance or destruction of existing or new archaeological sites
Social impact	<ul style="list-style-type: none"> • Interference with farm management. • Changed of sense of place • Job creation, contribution to the economy • Labour and working conditions impact • Community health and safety impacts • Impact on Indigenous peoples (Nama) 	<ul style="list-style-type: none"> • Conflict with and limits on existing land use and farm management. • Meeting increased electricity demand (positive impact). • Change of sense of place • Labour and working conditions impact • Community health and safety impacts • Impact on Indigenous Peoples (Nama) 	<ul style="list-style-type: none"> • Reduction in the availability of electricity in the country

Specialist study	POTENTIAL IMPACTS OF THE PROJECT		
	CONSTRUCTION	OPERATION AND MAINTENANCE	DECOMMISSIONING
		<ul style="list-style-type: none"> • Magnetic fields result from the flow of electric current and increase in strength as the current increases. 	
Occupational health and safety	<ul style="list-style-type: none"> • Exposure to physical hazards such as working in remote areas, heat stroke, tripping hazards, snake bites, working at heights, exposure to dust. <p>Exposure to live wires during construction, operation and maintenance activities</p> <p>Magnetic fields result from the flow of electric current and increase in strength as the current increases.</p>	<ul style="list-style-type: none"> • Exposure to physical hazards • Exposure to live wires during construction, operation and maintenance activities <p>Magnetic fields result from the flow of electric current and increase in strength as the current increases.</p>	<ul style="list-style-type: none"> • Exposure to physical hazards • Exposure to live wires during construction, operation and maintenance activities

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8.2 METHODOLOGY EMPLOYED FOR THE IMPACT ASSESSMENT

Each of the identified impacts listed above were assessed with the aim of determining their significance. The criteria used to assess and determine the significance of a potential impact on a particular environmental feature (i.e. vegetation, biodiversity, birds, archaeology and socio-economic environment) are described below.

The objective of the impact assessment, in the context of this Environmental and Social Impact Assessment (ESIA) report, is to formally assess all the significant environmental and social impacts that may arise as a result of the proposed activities, in terms of the following criteria:

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

8.3 ASSESSMENT OF IMPACTS

8.3.1 IMPACT ON VEGETATION

DESCRIPTION

Potential impact on vegetation is expected as a result of:

- Direct destruction of, or damage to, protected and/or endemic plant species, *Vachellia erioloba* in particular.
- Illegal collection of plant material such as wood or pods.

Mannheimer (2016), argues that, along the route proposed, with the exception of *Vachellia erioloba* (camel thorn), relatively low numbers of individuals belonging to species of concern might be damaged or destroyed, mostly during the construction phase of the proposed project, but this is unlikely to compromise their conservation status to any appreciable degree. This is because the project is linear and relatively narrow, greatly limiting the probable extent of impact on any habitat or species.

The project does not affect any habitats for vegetation that are considered "Critical Habitat", as defined in ESS6 of the World Bank Environmental and Social Framework (Appendix F).

MITIGATION

- Whenever possible trees, in particular camel thorn trees (*Vachellia erioloba*), should be trimmed rather than destroyed. This applies particularly to the construction and operational phases.
- Wherever possible pylon sites should be carefully selected and placed so as to avoid pan edges, banks of rivers and other drainage lines, and large camel thorn trees.
- Creation of additional tracks, including those made by bulldozers and other large construction vehicles, outside of the service track should not be avoided as far as reasonably possible.
- Staff camps should be pre-determined and marked and should be situated in areas which avoids unnecessary clearance of vegetation (trees).
- Include the conservation of trees in the consent agreement with landowners.
- Penalties should be in place for all contractors and sub-contractors that cause unnecessary collateral damage.
- Random collection of wood for fuel and/or heating should be forbidden. No harvesting of wood by operational/maintenance staff should be permitted. Any

wood used by staff for any purpose whatsoever must be permitted wood supplied by the farmers along the route themselves, or be invader species wood sourced from elsewhere.

- Plant collection of any plants or parts thereof, including seeds and pods, should be forbidden.
- Penalties, including dismissal for repeat offenders, should be in place for all contractors.
- Include mitigation measures including monitoring requirements below in the Biodiversity Management Plan (BMP).

MONITORING

- GPS marking with fixed point photography of areas with significant trees done before and after construction.

Table 8-2: Summary of Vegetation Impact Assessment

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
CONSTRUCTION PHASE (REPEATED DURING DECOMMISSIONING)								
Direct destruction of species of conservation concern, in particular protected tree species	Destruction of protected tree species caused by clearing of vegetation and damage due to vehicles	Regional	Long term to permanent	Medium	Highly probable	High	Medium	Low BMP, avoid protected species, particularly hotspot Camelthorn area, control of tracks and activities in ESMP
Direct destruction of species of conservation concern	Illegal wood or pod harvesting or removal of other plants species for fuel or other purposes cause the loss of protected species leading to biodiversity loss	Regional	Long term to permanent	Medium	Highly probable	High	Medium	Low Control in ESMP (BMP) with penalties
OPERATION PHASE								
Direct destruction of species of conservation concern, in particular protected tree species	Destruction of protected tree species caused by clearing of vegetation, damage by vehicles	Local	Long term to permanent	Medium	Highly probable	High	Low	Low to negligible BMP, avoid protected species, control of tracks and activities in ESMP
Direct destruction of species of conservation concern	Illegal wood or pod harvesting or removal of other plants species for fuel or other purposes cause the loss of protected species leading to biodiversity loss	Regional	Long term to permanent	Medium	Highly probable	High	Low	Low to negligible Control in EMP with penalties

8.3.2 WATER DEMAND, EROSION AND FLOODING

DESCRIPTION

A flood line analysis was conducted for the project site and highlighted the flood risks areas as outlined in the baseline assessment of this report. Based on the flood line analysis, the conclusions described below with regard to the potential risk of flooding and erosion were reached.

Soil erosion will only occur when there is flow in the streams which can be caused by two construction activities (i) the construction of the access track (ii) construction of pylon bases. Soil erosion, if not mitigated, may lead to financial costs to NamPower, should the pylons become unsteady, and will reduce the functioning of the ecosystem as topsoil protection is stripped from the area. Damage will only occur locally and will last as long as there is flow in the stream. In this area the period of flow is likely to be short. The erosion will continue during operations when the pylons and tracks are in the path of floods.

The drainage study concludes that there will not be significant impacts of the project on the environment. The affected environment can be categorised as having a high tolerance to disturbance from the envisaged infrastructure. However, the environment may impact on the project, and the specialist provided mitigation measures included in the ESMP. The specialist also provided inputs into areas where the line could be adjusted to avoid flood areas. This has been incorporated into the line presented.

The project water demand is estimated at a total of 5060m³ or 0.6m³/h (assuming an 8-hour pumping day). Borehole yields on farms generally vary from 0.5-3 m³/h. Impact on water resources is expected to be low, if the Contractor spreads water abstraction over the area, and diversifies the sources to also include surface water resources such as the Hardap Dam. Restrictions will be specified in the ESMP, to avoid very low yielding boreholes.

MITIGATION

- Access tracks construction to be with as little disturbance to the stream bed as possible. The track surface should follow the stream bed level as closely as possible.
- The access route has already been routed to avoid impacts on smaller water courses throughout the area, and flood risk areas. The Fish River is a major system that is avoided by the selected route alternative (preferred eastern route).
- Pylons must be placed outside the 1:100 flood line, as described in Section 5.1.2 and **Appendix F**. Where this is not possible the pylon bases must be designed to withstand erosion from flooding and be provided with flood protection. Without mitigation damage to pylons can be significant leading to high cost of repairs and power outages.

- Construction activities within the streams should be stopped for the duration of flow.
- Construction equipment and materials must be stored outside the 1 in 100 year flood line.
- The Contractor will be responsible to ensure that water requirements will not negatively affect the yields of individual boreholes and that water sources are sustainable. Very low yielding boreholes are to be avoided altogether.

Table 8-3: Summary of Water Resource, Erosion and Flooding Impact Assessment

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
CONSTRUCTION PHASE (REPEATED DURING DECOMMISSIONING)								
Soil erosion	Negative impact. Removal of soil causing a reduction in ecosystem resilience and functioning when there is flow in the streams caused by construction of tracks and pylon bases.	Local	Short term	Low	Probable	High	Low Avoid construction during the flow	Low
Water resource depletion	Negative impact. Diminished water resource on individual farms affecting farm operations and ecosystem.	Local	Short term	Low	Probable	High	Low to medium on individual farms (avoid abstracting water from such farms)	Low
OPERATION PHASE								
Soil erosion	Negative impact. Removal of soil causing a reduction on ecosystem resilience and functioning where there is flow in streams caused the presence of pylons and tracks in the way of the flow.	Local	Short term	Low	Probable	High	High Avoid construction in the 1:100-year flood line. Otherwise protect the bases to prevent erosion.	Low

8.3.3 IMPACTS RELATED TO WASTE DISPOSAL

DESCRIPTION

Waste on the project is expected as follows:

- Wood and organic refuse as a result of land clearing for the servitude. The 461 km of servitude will generate significant amounts of wood and plant refuse.
- The construction process will also result in various types of construction debris including waste such as scraps of cable, wooden cable spools, and wooden insulator crates.
- Low volumes of concrete waste are also expected at each pylon site.
- Maintenance of construction equipment will produce small amounts of waste plastic containers for oils and lubricants, broken filters and belts, and damaged tires.
- Construction and managerial staff will generate some waste such as paper, bottles, cans, plastics, and food scraps.
- Lower volumes of these wastes may be expected during operation.
- Effluent is expected at the construction camps, from washing and ablution facilities.

Waste volumes will be relatively low at each tower construction site, but cumulatively significant for the 461km project.

MITIGATION

A waste management plan is required in the ESMP for the minimisation, recycling, reuse and final disposal of wastes generated during construction and operation. Wastes generated may include the following and each category of waste should have a pre-determined method and procedure in place:

- Wood wastes – agreement with local community for collection and use
- Oils, lubricants, chemical containers, Batteries and electronic waste – arrangement with company for collection
- Metals: arrangement with recycle company for collection
- Food waste – dispose at farm owners waste disposal site
- General waste (paper, plastics, cans, glass) – preference that a recycle company collects, and such an agreement may be a possibility for the entire project, or parts thereof. Otherwise dispose of at nearest approved waste disposal site at the nearest towns.
- Wooden cable spools, pallets and crates: manage for re-use otherwise sell to collectors.
- Effluent: agreement with farm owners for use of existing facilities, or temporary removable sewage facilities disposed of at nearest sewage discharge facility.
- A no-tolerance policy against littering should be instituted on the farms
Agreements with farm owners should include agreed temporary waste management options, with waste requiring removal from the farm and disposal at municipal waste disposal facilities

Table 8-4: Waste disposal impact assessment

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
CONSTRUCTION PHASE (REPEATED DURING DECOMMISSIONING)								
Water and soil pollution, visual and ecological degradation along route and at construction sites, camps and laydown areas due to waste generation	Negative impact on natural resources, human health, and the capacity of waste disposal sites strained , due to waste disposal along the route and at the construction camps and laydown areas.	Regional national –	Short term	Medium	Definite	High	Medium to high	Low
OPERATION PHASE								
Water and soil pollution, visual and ecological degradation along route and at construction sites due to waste generation	Negative impact on natural resources, human health, and the capacity of waste disposal sites strained , due to waste disposal along the route and at the construction camps and laydown areas.	Local	Short term	Low	Definite	High	Low	Low to negligible

8.3.4 IMPACT ON AVIFAUNA

DESCRIPTION

During construction habitat degradation might be detrimental to bird breeding or feeding conditions. That is, clearing of the servitude and corridors will impact and disturb some sensitive species, and open up corridors for predators (avian and mammalian) that may not otherwise occur there.

Disturbance in the form of labourers, machinery and noise is the biggest impact to birds, during construction, particularly large breeding birds that use traditional nest sites on cliffs, large trees or pylon towers.

The key impact on birds is in the operational phase, and involves the potential collision by birds with power lines. There are a number of species that are particularly vulnerable to power line collision, to the extent that they are now considered threatened specifically because of high mortality rates from power line collisions resulting in declining populations (refer to **Section 5.3**). On this project it is particularly the Ludwig's Bustard and Kori Bustard preferring Dwarf shrub savanna habitat, that will be exposed to collisions with the power line.

Other potential impacts include:

- The potential electrocution of birds, mainly large species on support towers has largely been eliminated in the design of modern support structures.
- Disturbance and destruction of nests during inspection and maintenance, mainly relevant to threatened species breeding on the support structures.
- Short-circuits caused by birds as a result of direct electrocution, defecation on insulators (mainly by large raptors and colonial, fish-eating birds where power lines pass close to large water bodies) and building nests which may cause flash-overs, particularly when wet from rain, and which may catch fire.

Every new power line constructed poses an additional threat, particularly to species vulnerable to collision. The more spread-out across the landscape the power lines, the greater the threat. Bundling transmission lines as closely as possible reduces the geographic footprint and thus the exposure of a larger part of the populations of vulnerable bird species to risk.

MITIGATION

The transmission line route has already been aligned along an existing power line to the south to avoid cumulative impacts. NamPower identified suitable routing options for the transmission line in consultation with a range of personnel from NamPower, and with input from the environmental consultants and relevant specialists. The eastern route, as explained is believed to avoid the complex of wetlands to the east of the B1 Road. Yet, the remaining avifauna impacts require the following mitigation:

The following mitigation measures are conditional:

- Implement staggered power line mitigation along the existing 220kV power line.
- Avoid the high risk areas identified in the avian assessment, particularly north of Kalkrand where vultures feed and breed in the Kalahari biome (starting at S23°44'47" E 17°28' 04")
- Mark the areas where bird collision risks remain high with bird diverters.
- Work on construction to be undertaken outside the winter breeding months where large vulture or raptors are found breeding < 100 m from the line
- Avoiding large tree nests or cliffs where raptors or vultures are breeding
- Reducing the possibility of hunting, trapping or wilfully disturbing threatened red data birds, especially those breeding close to the line corridor
- A details of mitigation and monitoring programme will be prepared as part of the Biodiversity Management Plan (BMP). Additional avi-fauna studies will be conducted and will include identification of additional areas to be marked. It will further ratify the proposed staggering design approach and monitoring regime that will form part of the BMP.

Table 8-5: Summary of avifauna impact assessment

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST- MITIGATION
CONSTRUCTION PHASE								
Disturbance to birds, habitat modification/ destruction and poaching.	Red-listed species are disturbed in their feeding/ roosting/ breeding areas. Poaching of birds. This may result in a loss in biodiversity.	Regional	Short term	Low	Probable	Medium	Medium	Low
OPERATION PHASE								
Mortality of birds due to collisions with power line.	Loss of Birds (some of which are Red Data Species) due to collisions with power line. This may result in a loss in biodiversity.	Regional	Long-term/ Permanent	High	Certain	High	High	Medium

8.3.5 SOCIAL IMPACT

Desai (2016) made the following assessment regarding social impacts emanating from the proposed project, which has been updated (2023) to incorporate community health and safety, labour and working conditions, and indigenous peoples' issues.

8.3.5.1 Nuisances and community health and safety risks

DESCRIPTION

The construction activities will generate a range of nuisance factors (e.g. noise, dust, visual intrusions, traffic) resulting from vehicles, machinery, equipment and workers. This is likely to impact negatively on the general sense of place for residents and tourists; animals may also be affected by sudden loud sounds and increased activity on the farm. When the fences are being fitted with gates and the gates are open enabling access, there will be a risk of livestock and game escaping. The presence of workers onsite may increase the risks of vandalism, theft and general security on the farm to people, possessions, infrastructure and livestock. Construction activities will generate waste materials and debris. Allowing community members including children to access the construction areas, will also pose a health and safety risk.

An influx of workers is often an issue on large construction projects, but based on experience is not expected to be a significant concern on this project because employment opportunities will be limited.

Traffic volumes and associated inconvenience will increase in the project area, but this impact is expected to be low, since the construction phase has a limited time frame and the works progress in a linear fashion through the area.

MITIGATION

Pre-construction planning and negotiation

- Given the long delay between Environmental Authorisation and construction, NamPower will reconfirm the details of the affected landowners and users during the detailed planning phase.
- NamPower will negotiate fair compensation with the landowners and users; this should account for disruptions to livelihood activities (e.g. agriculture, hunting and tourism). This is a private negotiation that will be handled on an individual basis. An abbreviated Resettlement Action Plan is also prepared as part of the ESMP.
- The construction schedule and process should be designed to avoid the high tourist and hunting seasons. The landowners and users involved in tourism activities should be requested to confirm this information as part of the detailed planning process prior to construction.

- The construction schedule should be discussed with the commercial farmers to enable them to plan the rotation of livestock accordingly. Their limitations should be accommodated, where possible.
- The schedule and approach to construction must be presented to the directly affected receptors and constituency leaders for input prior to finalisation.

Generic construction phase management measures

- Each affected landowner or user must complete a site 'audit' before construction commences. They should document the state of their properties and assets prior to construction; the inclusion of photographs should be encouraged. Post-construction, the site should be reassessed to ensure that the farm is left in an acceptable state.
- Post-construction, the affected landowner or user should be invited to join NamPower and the appointed contractor for a 'walk down' the power line route to identify any outstanding issues.
- Traffic, dust suppression, visual disturbances, and safety measures are specific in the ESMP.

Recruitment procedures to enhance local employment

- Local employment enhancement will likely reduce the number of general workers from outside the area, and discourage influx.

Workforce management

- Workforce management is to be specified in the ESMP, according to a Code of Conduct agreed on for protocols for working on affected land.

Ongoing engagement and grievance management

- Implement the grievance procedure mentioned in the previous section.

8.3.5.2 Exposure to electromagnetic fields

Exposure to electromagnetic fields potentially causing health risks is a scientific and community concern with transmission line projects.

There is however, no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmission lines and equipment (EHS Guidelines Electric Power Transmission and Distribution, 2007).

Electric and magnetic fields (EMF) are always created, in varying levels, with the generation and use of electricity and at the frequency of the electrical power system (**Table 8-6**).

Table 8-6: Summary of typical magnetic field levels encountered in various environments and close to household appliances (Hubbard, 2012)

DESCRIPTION	MAGNETIC FIELD (μT)
Directly below 400kV power line at ground level.	40
25m from centre line of 400kV power line.	8
Directly below 132kV power line at ground level.	7
25m from centre line of 132kV power line.	0.5
Vacuum cleaner, electric drill.	2 – 20
Food mixer.	0.6 – 10
Hair dryer.	0.01 – 7
Dish washer.	0.6 – 3
Washing machine.	0.15 – 3
Fluorescent lamp.	0.15 – 0.5
Ambient field inside homes.	0.01 – 0.2

Any biological effects that may occur from exposure to microwave frequencies will be as a result of heating of biological tissue. Safety precautions, for this frequency range, are thus based on limiting field levels that may cause a rise in tissue temperature.

Guidelines for electric and magnetic field exposure are set by the International Commission for Non-Ionising Radiation Protection (ICNIRP 1998) and (ICNIRP 2010). This organisation is linked to the World Health Organisation (WHO) and receives worldwide support.

The ICNIRP standards for electromagnetic field exposure associated with power lines can be summarized as follows:

Table 8-7: Electric and magnetic field exposure guidelines set by ICNIRP (1998) and ICNIRP (2010) versions.

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

The highest exposure is at the conductors, from which point there is an exponential decrease with distance (**Figure 8-2**). At a distance of 40m from the source, the radiation levels are expected to be less than 0.5 μ T .

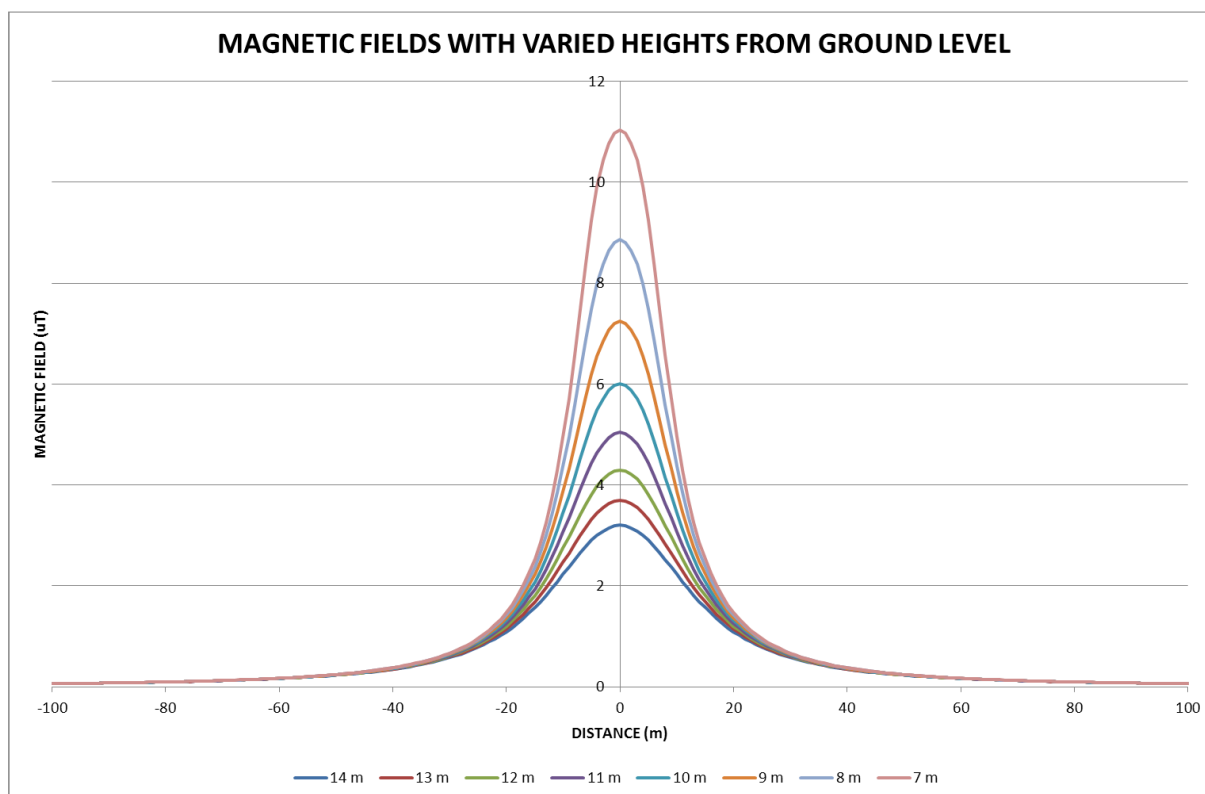


Figure 8-2: Typical Magnetic Field Levels expected from the 440kV Lines.

When considering the existing and proposed servitudes and the facts presented, the following are concluded :

- At 40m distance from the source the expected magnetic exposure is below 0.5 μ T which is 99.95% below the prescribed ICNIRP guidelines (2010). Exposure directly under the conductors would also be far below the given standards.
- With distance the exposure decreases exponentially, tending towards zero.

- Evidence does not support any causal relationship between exposure to electromagnetic fields and cancer (e.g. Leukemia), impacts on reproductive health and adverse neurobehavioral effects, or developmental effects.
- The absence of evidence on health effects is generally not considered to mean evidence of the absence of health impacts and has resulted in some scientists advocating caution (precautionary principle) and finding ways to avoid or reduce exposure.

The closest residences where there may be prolonged exposure to electromagnetic fields, is at least 350m away, with most being further than 1km away. Given the above facts and guidelines, potential impact on health is considered negligible and no mitigation is required.

8.3.5.3 Destruction or Disruption to Homesteads and Farm Infrastructure

Following a number of alterations to the proposed route alignment, the impact on homesteads and farm infrastructure resulting from construction activities would remain a negative impact that will be experienced in the immediate proximity of the site (low extent). All structures have been avoided with the siting of the servitude; however, the construction works is likely to cause some disturbance to infrastructure. The total construction duration is ~24 months (short-term) but the impact will be experienced at single locations for short periods of time (6-8 weeks) as the work progresses along the line; as such the construction phase duration will be low for each farm. The intensity will be low given that all known farm infrastructure has been avoided. There may still be impacts to some view sheds from residences and there will be planned alterations to fences; however, these alterations may be seen as a positive impact for some farmers.

MITIGATION

Over and above the mitigation mentioned in the previous section, the following is recommended:

- Any damage to property (intentional or unintentional) by workers or construction equipment should be compensated in a manner agreed to by the landowner or land user.

8.3.5.4 Employment creation and benefits for the economy

DESCRIPTION

Positive benefits may be experienced for the national and regional economies (high extent); some local economies may also benefit. More reliable and secure power will be available that may or may not translate into actual economic benefits nationally.

NamPower will be in a position to more readily trade with electricity to South Africa in future.

ENHANCEMENT

Even though employment creation will be relatively limited, labour and working conditions need to be specific in the contract according to ESS2 of the World Bank as well as the Labour Act and Health and Safety Regulations of Namibia. These will be specified in the ESMP. Recruitment of labour should be from the project affected population where possible.

8.3.5.5 Compromised labour relations

DESCRIPTION

A general potential risk on construction projects is the exploitation of the workforce lacking the protection of their rights. Not giving attention to these matters on a project may lead to compromised relations, worker dissatisfaction, and unresolved grievances. By applying Namibian labour, regulations combined with specific provisions of the World Bank, in the construction contracts, and managing the contracts to ensure compliance, these risks are reduced to a low significance.

The following specific risks with regard to labour can be distinguished:

- Health and safety risks, particularly working at heights, and working near live wires (see Section **8.3.5.6**).
- Likely incidents of child labour or forced labour. Worst forms of child labour in Namibia occur in the agricultural, fishing and services (domestic work and street work, including begging and food service, including selling fruits, phone vouchers, and small goods) sectors. Child labour on this project, where a formal contractor is expected to comply with Government Regulations, is not expected to be a significant risk. Regular monitoring should be done on the project to check that all workers are 18 years of age or above. ²⁸ Legal requirements in this regard should be set in the Labour Management Plan (LMP).
- Likely presence of migrants or seasonal workers. The project has a duration of 36 months; therefore a seasonal workforce is a low risk. However, a limited number of migrant workers (workers employed for a limited period) could be employed by the contractor if not managed. Therefore, limitations should be set in this regard in the LMP, namely that workers should be utilised from the local area as far as possible.

²⁸ <https://www.dol.gov/agencies/ilab/resources/reports/child-labor/namibia>

- Risks of labour influx. Labour influx is expected to be limited, since people in search of job opportunities will normally move to large cities or to projects where the prospect of a job is considered good, unlike this project, which employs a low number of people and has a short duration. The limitation of using local people and working with the regional council officers during recruitment is expected to be adequate.
- Risks of gender-based violence. Gender based violence is a risk in any situation in Namibia where both males and females will be working together for a period, especially when male and female labourers are accommodated for prolonged periods of time. Since expected employment figures are low, this risk is similarly low. Mitigation recommended include employing labourers from the local area where the work is conducted, divulging workers' rights to them and ensuring an accessible grievance mechanism on the project. These are included in the LMP.

MITIGATION

The Namibian Labor, and Health and Safety Regulations should be applied, combined with the World Bank Standards (Ess2: Labour and Working Conditions), which aim:

- To promote safety and health at work .
- To promote the fair treatment, non-discrimination and equal opportunity of project workers .
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children of working age, including those directly employed and contracted workers.
- To prevent the use of all forms of forced labour and child labor .
- To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law.
- To provide project workers with accessible means to raise workplace concerns. This is achieved through the requirement of an appropriate grievance mechanism put in place for the workforce, which is operational and accessible.

8.3.5.6 Labor Health and Safety

DESCRIPTION

There are general health and safety risks applicable to construction projects. These include among others, exposure to physical hazards from use of heavy equipment and cranes; trip and fall hazards; exposure to dust and noise; falling objects; work in confined spaces; exposure to hazardous materials; and exposure to electrical hazards

from the use of tools and machinery. Specific health and safety risks associated with power line construction and operational projects include working at heights, working near live power lines (the existing 220 kV transmission line will be live while this line is being constructed, working with live wires during operation, electric and magnetic fields exposure (adjacent 220kV power line) and exposure to chemicals.

Should the Namibian and World Bank health and safety measures be implemented, as described below, then health and safety risks will be minimised.

Exposure to magnetic fields (EMF) are discussed in Section **8.3.5.2** from a community health and safety point of view. The principles mentioned are also applicable to the workforce, namely that, at a 40m distance from the source the expected magnetic exposure is below 0.5 μ T which is 99.95% below the prescribed ICNIRP guidelines (2010). Even directly under a power line, the exposure will be well within the above limits.

EMF exposure would be applicable to the adjacent 220kV power line. The latter servitude will be at least 25m away from the nearest boundary of the proposed 400kV servitude. Exposure levels are therefore expected to be low and within the ICNIRP standards.

MITIGATION

General health and safety

- General health and safety standards should be strictly adhered to, including those of the Health and Safety Regulations of Namibia and the World Bank. These standards are specified in the ESMP and should be specified in the construction and maintenance contracts.

EMF levels

- Personal exposure monitoring equipment should be set to warn of exposure levels that are below occupational exposure reference levels, particularly during maintenance when the wires are live.
- ICNIRP standards for minimum exposure limits should be adhered to, as included in the ESMP.

Exposure to live wires

- Only allowing trained and certified workers to install, maintain, or repair electrical equipment;
- Workers should not approach an exposed energized or conductive part even if properly trained unless:
 - o The worker is properly insulated from the energized part with gloves or other approved insulation; or,
 - o The energized part is properly insulated from the worker and any other conductive object; or,
 - o The worker is properly isolated and insulated from any other conductive object (live-line work) (
- Workers should not approach an exposed energized or conductive part even if properly trained unless: 1) The worker is properly insulated from the energized

part with gloves or other approved insulation; or, 2) The energized part is properly insulated from the worker and any other conductive object; or, 3) The worker is properly isolated and insulated from any other conductive object (live-line work).

- Where maintenance and operation are required within minimum setback distances, specific training, safety measures, personal safety devices, and other precautions should be defined in a health and safety plan. (IFC Environmental, Health and Safety Guidelines, 2007).

Working at height during construction and operational phases

- Testing structures prior to commencement of work;
- Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others (IFC Environmental, Health and Safety Guidelines, 2007).

Exposure to chemicals

- The measures prescribed for handling hazardous substances are also applicable to the exposure of chemicals, particularly the use of pesticides during maintenance.
- The use of pesticides should be avoided.
- Should limited amounts of pesticides be used only when there is no other practical alternative, then proper training should be ensured of those applying same.

8.3.5.7 Changed sense of place

DESCRIPTION

The visual intrusion resulting from the presence of the proposed transmission line phase may negatively affect the sense of place for some receptors in the Project area. The majority of the farms and receptors will only be marginally negatively affected by the proposed Project. The intensity will range considerably depending on the land use activity, the value placed on the visual landscape by individual receptors, and the associated expectations of each receptor. It is therefore expected that intensity will be low for the majority of affected receptors and high for a small number of receptors; notably some land owners/ users and some tourists. Local experience on Project affected farms and farms in the broader area have demonstrated that most tourists do not react negatively to the presence of existing transmission lines.

MITIGATION

Where the route does not follow the existing 200kV line it is recommended that, prior to construction, when the farms are visited for negotiations, small adjustments to the route be considered to avoid specific view sheds.

8.3.5.8 Land use restrictions in the servitude area and disruption to farm management

During the operational phase of the project, it is expected that agriculture and tourism activities can continue uninterrupted. Land use restrictions are that structures (e.g. windmills, houses, lodges) cannot be built within the transmission line servitude and NamPower will require unhindered access to the servitude for line inspections and repairs, if required. NamPower personnel will undertake monitoring visits approximately every 3 years and on an *ad hoc* basis should the need arise. They will have keys to access the property as required.

Some farmers are concerned about the presence of workers on their land, degradation of farm roads, risks linked to leaving gates open, damage to fencing, and litter. The most concerned farmers are those that make use of aircraft for farm management; they are concerned about the risks of flying. This is considered to be a negative impact.

Some farm owners have expressed concern about potential electromagnetic radiation impacts on the health of their families and workers. However the line is at adequate distances away from any homesteads and areas where people spend much time or congregate (shortest distance 250m, mostly more than 1km) for this not to be a concern (see EMF section above).

MITIGATION

- Land use restrictions are being compensated to each affected land owner (i.e. wayleaves), according to NamPower standard practice, which includes an amount per Ha paid out to the land owner. It includes a wayleave agreement demonstrating the area affected, the size and the amount being compensated.
- Management of workforce and monitoring visits similar to the construction phase.
- Warning spheres to be installed close to any landing strips.
- NamPower will comply with all the civil aviation regulations and the line will be registered with the civil aviation authorities.
- The coordinates may be provided to concerned landowners whom will then be in a position to introduce this data to their aviation systems.

8.3.5.9 *Impact on indigenous Peoples: Nama traditional communities and their livelihoods*

DESCRIPTION

It has already been shown above that the proposed servitude is far removed from any homesteads or settlements throughout the project area. This also applies to the communal area of the Nama people and all other areas where they reside.

The livelihoods of the Nama people include their livestock which are herded throughout the communal area between Mariental and Keetmanshoop. The large size of this area means that the power line construction and operational activities will not appreciably upset these livelihood strategies.

Very little of the low shrubs and grasses will be removed (only for the 12m two-spool maintenance track) and grazing impact will therefore be minimal

Due to the vast size of the conservancy (2427km²), compared to the small strip of the proposed servitude passing through, construction activities will have a minimal and temporary effect on the hunting activities undertaken in it (maximum three months).

The servitude does cross the hunting zones, as shown on **Figure 6-4**. However, hunting activities in the area are limited to Springbok only. Hunting permits for other antelope such as Kudu, Steenbok, Gemsbok, and Klipspringer, are currently not issued due to their very low numbers. Disturbance to wildlife will therefore be for a limited period and grazing impact will be negligible. Hunting activities, which are for a short season in Winter, will likely not be disturbed at all.

Activities during operation and maintenance will also be very limited. Even though no structures may be erected within the power line servitude, the area is very large and this will have no discernible effect on the available area for settlement.

It is concluded that the construction and operation of the proposed project will not affect the Nama people and their livelihoods to any discernible degree.

Conversations with the Conservancy Committee, Nama community representatives and other traditional leaders from the Constituency confirmed this conclusion. Their only concerns were 1) whether the line affects the settlement at Kriess (as explained it does not, since it is routed 250m from the closest structure); 2) whether their livestock posts will be affected (grazing is not affected, save for the limited area during construction, and no structures are affected), and 3) whether there will be any job opportunities on the project. Attendants were explained that it will be made a condition that people of the local area should be employed on the project, but that job opportunities will be limited. The Stakeholder Engagement Report (**Appendix E**), contains the minutes of the meeting held with the conservancy and constituency representatives.

MITIGATION

The following recommendations are made for the participation of the Nama people on the project and for mitigation:

- Engagement with the Nama community representatives and the !Khob !Naub Conservancy members should be ongoing before, during and after construction. Conditions to this effect are included in the Stakeholder Engagement Plan.
- Engagement should include an agreement with regard to conduct in the conservancy during construction and operation, to avoid disturbance to wildlife, unnecessary habitat destruction, water sources, etc. All the same general respect to other land owners, with mitigation as applicable, will be applicable in the Nama traditional area.
- The Nama people should specifically be represented on the construction workforce. Since a large proportion of the project area is inhabited by Nama people, it is recommended that at least 30% of the construction workforce be made up of Nama people. This target has been included in the Labour Management Plan.
- It is recommended that a social responsibility project be undertaken in the area where the Nama people reside. It is recommended that a specific area of training which may lead to a trade, be considered, for example the making of furniture and other items from the pallets and spools which will become available during construction. Nampower should employ a consultant to investigate such a project in conjunction with the community and to facilitate its implementation.

Table 8-8: Summary of the potential impacts of the proposed power line project on the social environment.

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
CONSTRUCTION PHASE								
Employment creation	Positive. People recruited and contributing to the economy for the livelihoods of their families, communities and the country.	Local	Short term	Low	Probable	High	Enhancement measures specified in ESMP Low	Medium
Compromised labour relations	Negative. Workforce, including vulnerable people are treated unfairly and their health and safety is jeopardised due to unfair, unsafe practices at the workplace.	National	Long term/permanent effect	High	Probable	Medium	Labour and working conditions specified in the ESMP, with a Labour Management Plan. Medium	Low
Disruption of livelihood activities, community health and safety	Negative. Social nuisances and effects on livelihoods caused by construction activities specifically on commercial farms and tourism areas. Increased traffic.	Local	Short term	Low to medium	Highly probable	Medium	Mitigation measures to manage the workforce with a Code of Conduct, communication with affected land owners, etc. Traffic management. Low-to medium	Low

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
Impact on homesteads and farm infrastructure	Negative. Despite all known infrastructure and structures have been avoided through carefully routing the line, there still remain visual impacts and possible disruptions to some infrastructure in isolated cases.	Local	Short term	Low	High	High	Low Agreements and ongoing communication with land owners. Grievance mechanism.	Very low
Worker health and safety	Negative. Health and safety risks are associated with hazardous working conditions generic to constriction projects, and includes specific health and safety risks related to power lines including working with heights, live wires and chemicals exposure.	Local	Short term (long term to permanent if fatal/serious injury)	High	Highly probable	High	High Implement health and safety regulations.	Low
Impact on indigenous peoples (Nama Community)	Disruption to hunting and grazing activities, lack of engagement with the community, discrimination regarding job opportunities, disruption of activities due to construction.	Regional	Short term	Medium	High	High	Low negative Ongoing engagement, include in job opportunities, social project including training and project implementation for Nama people	Low- medium positive

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILITY	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST-MITIGATION
OPERATION PHASE								
Benefits to the economy	Caused by a more secure and reliable network, indirectly benefitting the national and regional economy and increasing electricity trade possibilities with SADC.	National	Long term	Medium	High	High	Low to medium	Low to medium
Changed sense of place	Affected viewsheds and on farms at specific receptors that place a high value on this resource.	Local	Long term	Low on line, high for specific receptors	Definite	High	Small changes to route made in specific cases if possible. Low generally, High for specific receptors	Low generally, high to medium for specific receptors.
Land use restrictions and disruption to farm management	Loss of land use possibilities in the servitude area, disruption to farm management due to the three-year inspection by NamPower personnel.	Local	Long term	Low	High probable	High	Proper protocol on farms Medium	Medium to Low
Impact on indigenous peoples (Nama traditional community)	Impact on livelihoods (grazing and hunting), disturbances to activities	Regional	Long terms	Low	Highly probable	High	Proper protocol, ongoing engagement, inclusion in long term project. Negative Low	Positive, low for Nama community

8.3.6 DESTRUCTION OR DAMAGE TO ARCHAEOLOGICAL SITES

DESCRIPTION

The following sensitive archaeological sites were identified within the proposed Kokerboom to Auas transmission line corridor:

- QRS 243/604 S26.14268 E18.30721: Pre-colonial burial cairn 2m diameter, slightly dispersed, on stream terrace.
- QRS 243/605 S26.14444 E18.30861: Colonial era grave, 2.2m long, unmarked, on stream terrace.
- QRS 234/615 S22.88937 E17.56039: Historic/modern farm cemetery >50 graves, fenced, 30m east of road centreline. Confirmation is required as to whether this is the site referred to by the I&AP Comments and Response Report (4th August 2016), Item B035, Mr Romeis. The site is an established cemetery and unlikely to be affected by the proposed Kokerboom to Auas transmission line corridor.

These sites are not directly situated on the corridor, but may be implicated due to construction activities, specifically construction vehicles.

During construction they may further be implicated by gully erosion.

MITIGATION

- Mark the site, introduce supervision, barrier fencing, and deviate the servitude track.
- Should this not be possible, the sites should be excavated and removed by a specialist.

Table 8-9: Summary of archaeology impact assessment

POTENTIAL IMPACT	STATUS/ NATURE	EXTENT	DURATION	INTENSITY	PROBABILIT Y	DEGREE OF CONFIDENCE	SIGNIFICANCE	
							PRE-MITIGATION	POST- MITIGATION
CONSTRUCTION PHASE								
Disturbance and/or destruction of heritage resources.	Three sensitive sites could be implicated by the movement of vehicles.	Local	Short term	High	High	High	Protect, if possible, otherwise remove by a specialist. High	Low
OPERATION PHASE								
Disturbance to/destruction of sensitive archaeological sites due to erosion	Three sensitive sites could be implicated during operation through vehicle movement and gulley erosion.	Local	Long term	High	High	High	Protect, if possible, otherwise remove by a specialist. High	Low

8.3.7 ASSESSMENT OF CUMULATIVE IMPACTS

8.3.7.1 Introduction

According to the Cumulative Impact Handbook (IFC, 2013) cumulative impacts “are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities.”

Cumulative impacts are normally considered for projects where it is clear that there is a combined effect of multiple pasts, existing and/or future developments. In the context of this project, there will be three power lines owned and operated by NamPower. The Main B1 Road connecting the South Africa, and the South of Namibia to the interior, could be added as another major linear project.

The Handbook referred to above, provides guidelines for a Cumulative Impact Assessment (CIA), to be carried out for such situations.

The cumulative impact assessment in this section draws upon cumulative impact assessment work carried out during the Scoping Report (2016) and the Social Impact Assessment conducted in 2018. The CIA Handbook requires that VEC's (valued Environmental and Social components (VEC's) be determined in collaboration with stakeholders. Ongoing engagement with stakeholders indicates what they consider to be VECs, although the engagements did not specifically include such terminology. This CIA is a first attempt for NamPower to expand and strengthen their thinking about cumulative impact and its management, along with other stakeholders whose developments may contribute to the situation, or who have scientific and community contributions to make.

8.3.7.2 Scope of the assessment

For the purposes of this assessment, the combined effect of the existing 220kV and planned 400 kV transmission lines are being considered. This could in future be expanded and strengthened by adding the other existing corridors in the area. There are no other planned major corridors along the main route between Keetmanshoop and Windhoek that have been disclosed.

8.3.7.3 Valued Environmental and Social Components (VECs)

“VECs are environmental and social attributes that are considered to be important in assessing risks; they may be: physical features, habitats, wildlife populations (e.g., biodiversity), ecosystem services, natural processes (e.g., water and nutrient cycles, microclimate), social conditions (e.g., health, economics), or cultural aspects (e.g., traditional spiritual ceremonies). While VECs may be directly or indirectly affected by

a specific development, they often are also affected by the cumulative effects of several developments." (IFC, 2013)

Based on scientific and community concerns regarding cumulative impact, the following VEC's have been selected:

- a) Health of vegetation (particularly *Vachellia erioloba*)
- b) Health of bird populations particularly those susceptible to power line collisions especially Ludwig's Bustard and Kori Bustard
- c) Visual quality as a tourism resource
- d) Social conditions on farms (specifically conflicts related to power line construction workers and maintenance teams)

8.3.7.4 Servitude width and are affected by the transmission lines

The entire length of the proposed transmission line is estimated to be approximately 500 km.

The servitude will be 80 m wide for the entire line an estimated 12 m width needs to be totally cleared of vegetation and obstacles to create a service road, to provide access (during construction and maintenance) to the line throughout its lifespan of 30 years. Owing to its larger footprint, the area about the centre of each V-structure to be cleared of vegetation will cover an area of approximately 70 m X 50 m. The ESIA team however assessed a corridor of 500 m wide (250 m on either side of the proposed line).

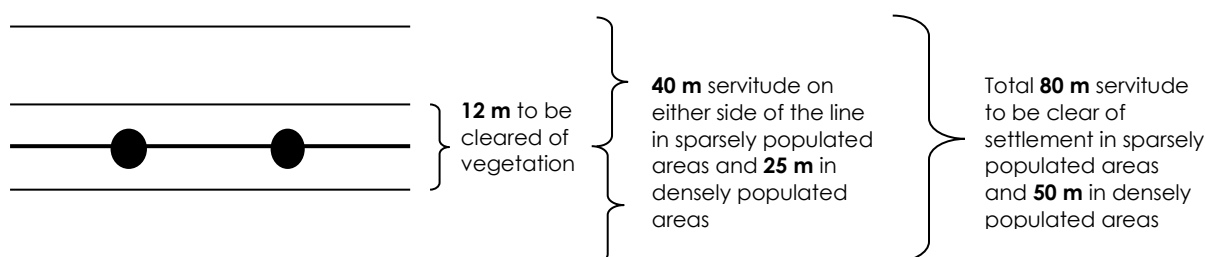


Figure 8-3: Servitude details for the proposed transmission line

Since the line will run parallel to an existing power line to the south (about 75% of its length), the servitude width there including the existing line will be 111m in total, consisting of a minimum distance of 46m between the two lines, and a 40m servitude outside the centre line of the 400kV line, and 25m outside the centre line of the existing 220kV line (**Figure 8-4**).

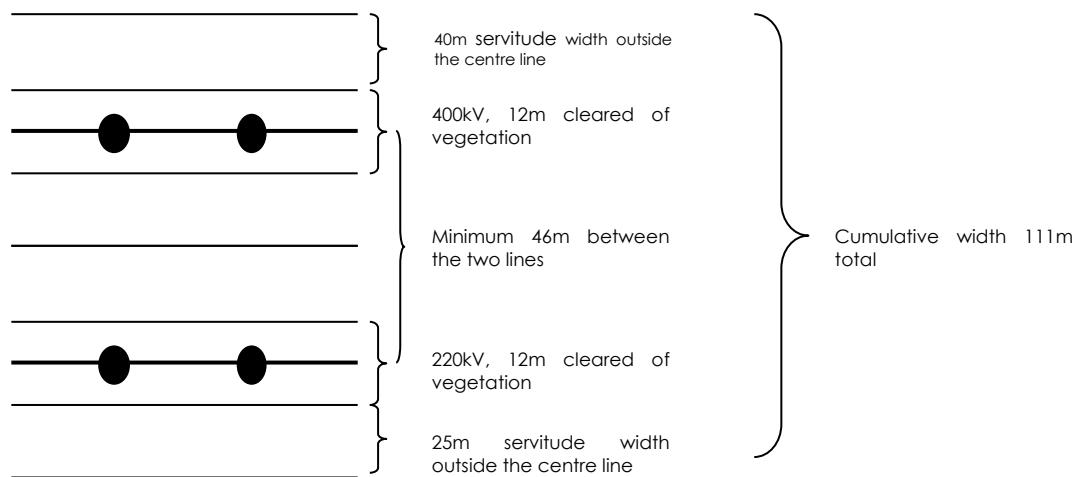


Figure 8-4: Cumulative servitude of the 400kV and 220kV lines adjacent to each other.

The impacts on the four identified VECs are discussed below.

8.3.7.5 Cumulative impact on vegetation

Impact on vegetation is over the long term for woody species, particularly Camel thorns in the study area. Whereas smaller plants can be allowed to grow back under the line, large Camel thorns are often removed. These trees have significant ecosystem, social and heritage value. The large ones are several hundreds of years old. There is a risk area on the project North of Kalkrand for this project. It is likely that some Camelthorn trees were removed during the construction of the existing 400kV transmission line. More trees are likely to be removed that are in the way of the servitude, for this current project too. This is the key cumulative impact on vegetation resulting from the project, although the species' welfare will not be threatened in this event; their distribution is widespread. General habitat destruction is cumulative because an increased area under the servitudes is being cleared.

Important mitigation to consider in this case to curtail cumulative effects are:

- Avoid habitats where the vegetation is of a higher conservation concern, generally on outcrops and ridges, in the study area. The route has avoided such areas, except where there is no other way.
- Align corridors alongside each other to avoid habit fragmentation. This is being achieved for a large part of the route.
- Trim, rather than remove large trees where possible.
- Use the same access road for both corridors.

These together with other general vegetation management measures will be combined in the Biodiversity Management Plan (BMP) for the project.

8.3.7.6 Cumulative Impact on avifauna

Details of the two power line structures (M van der Merwe, NamPower, pers. comm. 17 July 2023) are compared in **Table 8-10**.

Table 8-10: Comparative components of the planned 400kV and existing 220kV line structures that will run largely in parallel.

Line	Structures	Tower height (m)	Span length (m)
Planned 400kV	V-type guyed (cross rope) suspension tower (90% of the line) Self-supporting strain structures	28.5m to 43.5m, most commonly 37.5m	Approx. 550m
Existing 220kV	Self-supporting, double circuit lattice pylon (suspension and strain structures)	32m to 40m, most commonly 34.5m	Approx. 450m

As explained in ECS (2020), the NamPower/Namibia Nature Foundation Strategic Partnership database (October 2017; EIS 2017), indicates that of the top 5 bird collision species in the Namibian landscape, 4 are also Red Data species. Bustard collisions, one of these species, have been recorded in large numbers in the south, the study area, and specifically along the existing two power lines namely the 220V and the 400kV line. Of 2 surveys, fatalities along the lines are up to 0.66 fatalities/km/year under the 400kV line in the south. This means that up to 4316 Bustards can be lost over the life span of 20 years within their habitat.

Furthermore, Africa Conservation Services (2020) comments on existing cumulative impact:

"Thousands of kilometres of high voltage power lines criss-cross Namibia and South Africa and red data birds such as bustards, cranes, and vultures are killed and less-often electrocuted on these lines. Including those killed on the smaller reticulation lines 46 000 bustards are estimated to be killed annually in South Africa (Shaw et al. 2015a) and similar figures are likely for Namibia. This is causing population declines. Thus, there are wide-spread and far-reaching cumulative effects for the collision-prone red data species in southern Africa and the staggered pylon mitigation may be the most effective means of reducing this exceptionally high mortality rate."

Simmonds (2020) recommended that the 400kV line, with a very high current mortality rate as explained above, be staggered with the current proposed transmission line (**Figure 8-5**). He argues that, by realigning the new lines adjacent to the existing 220 kV line and **staggering the pylons**, the high bustard fatality rate is expected to be reduced to acceptable levels. Most bird strikes occur with conductors and earth wires between the towers – usually mid-span, the ideal configuration would be to place the

towers of the proposed line about mid-way between the towers of the existing line. The towers become a visual obstruction for the birds and would help mitigate bird strikes. This new mitigation measure arises because extensive research shows that bustards (the main collision species) hit the towers themselves by only about 10% of the time, and thus seem to avoid them. Thus, by aligning the tower of one line with the mid-span of the adjacent line, bustard fatalities could be reduced by >50%. This may make a significant contribution to reducing bird strikes on both lines. As part of the preparation of the BMP, the proposed mitigation measure will be further ratified through engagements with specialist in this topic.

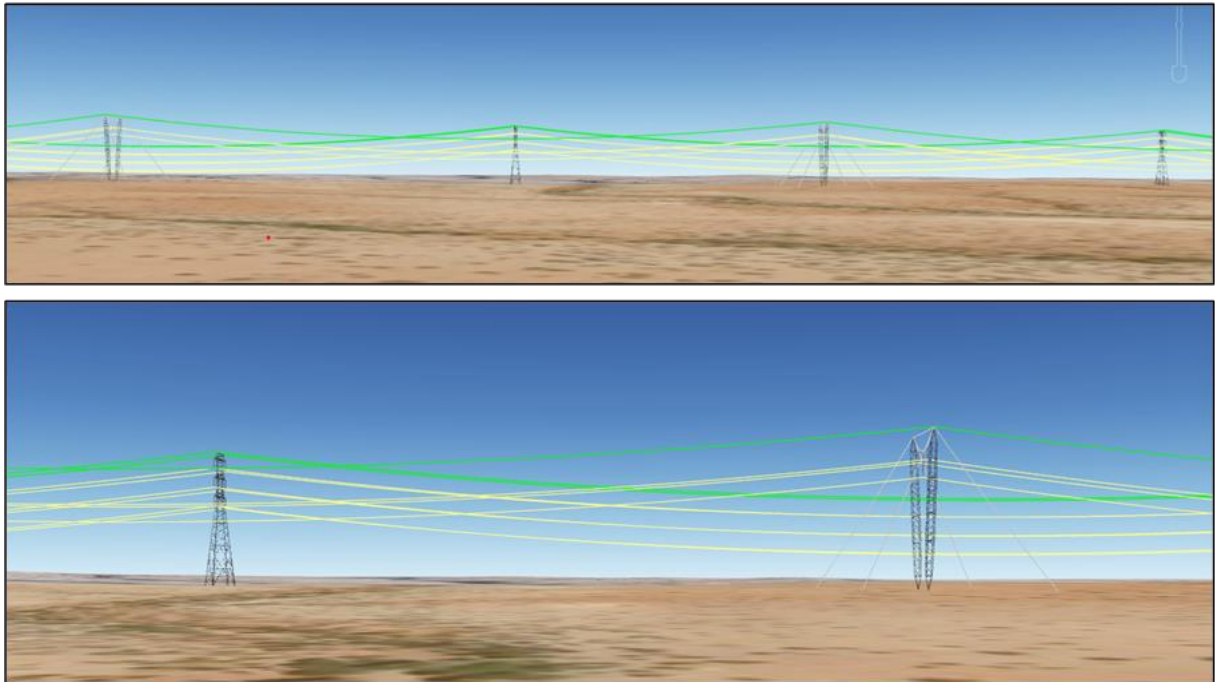


Figure 8-5: Examples of “staggering” or offsetting of the planned guyed 400kV and existing self-supporting 220kV power line structures (yellow lines = conductors; green lines – optical ground/earth wires; the intended centre line distance between the two structures is 46 m (power line modelling provided by M van der Merwe, NamPower, pers. Comm, 2023, cited in ECS, 2023).

NamPower confirmed that this arrangement of pylons of the existing 220kV line and the new 400kV line, will in fact realise. The outcome would therefore be mitigation of the existing mortalities as well as mitigation on the current proposed line, bringing about a positive impact on the existing 400kV line in terms of bird collisions and a reduced impact on the new line. This results in an offset of impacts. Cumulative impact of project can thus be considered as follows:

	Significance of Impact of existing 220kV transmission line (no mitigation)	Significance of proposed new 400Kv transmission line (not staggered)	Significance of both lines aligned, and staggered
Bird collisions and resulting fatalities particularly bustard collisions in savanna habitat	High	High	Moderate

The cumulative effect of adjoining the two transmission lines is therefore considered to potentially lead to a significant reduction in Bustard mortalities and curtailment of the current population decline. Staggering, bird markings and monitoring is prescribed in the ESMP and will be included as part of the BMP.

8.3.7.7 Cumulative impact on visual quality as a tourism resource

On many of the Project affected farms, there are already one or more transmission lines. The addition of a new line will exacerbate the already disturbed visual appearance of the area. Thus, the negative cumulative impact will be enhanced.

For some owners, however, this is not a concern as the lines are in an area on the farm where it does not cause a negative visual effect. For others, notably the communal areas, cultural preferences and land use mean that the visual resource is not highly valued or utilised. Based on interactions with the Project Affected Parties, there are only a few cases where cumulative visual impact is a concern. In all cases where this matter was raised, NamPower made an effort to move the line to avoid vistas and other elements important to the farm owner. There is one known case where nothing could be done to reduce visual impact of the high voltage transmission lines, although NamPower agreed to move a smaller low, voltage line for the owner as an offset. Thus, for the overall project, cumulative visual impact as it related to tourism, is considered to be low.

This matter, however, needs continued consideration as the area has more tourism potential and this needs to be preserved for future generations.

8.3.7.8 Social conditions on farms (specifically conflicts related to power line construction workers and maintenance teams)

Interactions between the work teams and the farm owners' activities causing conflict, insecurities and risks for farm owners have been discussed in the impact assessment. There is only one project foreseen, namely this 400kV line, which will have such construction activities running at one given time frame. However, farm owners have

had to deal with the related frustrations in the past, and this project will likely add to these frustrations. Another cumulative effect is the maintenance teams accessing the farms cumulatively to work on the multiple lines.

Protocols dealing with these matters need to be spelled out in a general management plan and a specific one for the current cumulative situation on the farms in the study area. The grievance redress mechanism is crucial in terms of dealing with conflict and management of maintenance teams on the farms. This matter is addressed in the ESMP.

9 STAKEHOLDER ENGAGEMENT AND INFORMATION DISCLOSURE

9.1 INTRODUCTION

The Stakeholder Engagement and Information Disclosure process on this project is being aligned with the Namibian Environmental Management Legislation and Regulations (2017) as well as with World Bank ESS10: Stakeholder Engagement and Information Disclosure.

The objectives are ESS10 are as follows:

“To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties.

- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance.
- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them .
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format
- To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances .

The stakeholder engagement process on this project has a history since 2016 and various iterations has afforded the team the opportunity to iron out most of the concerns of the project affected parties and other stakeholders, particularly the bird specialists. The details of the work done so far and the outcomes thereof, are contained in the Stakeholder Engagement Report (**Appendix E**), with the Stakeholder Engagement Plan used to gauge additional work needed and outlines work needed going forward to future stages. The salient aspects of it are provided below.

9.2 WORK DONE TO DATE

9.2.1 Engagement during 2016 Scoping Study

This work was extensive and engaged affected landowners, neighbouring landowners, organs of state and public, who involved themselves in the environmental assessment process. Already at that stage there was general support of the conclusions and recommendations of the scoping assessment as presented at the public meetings.

Concerns about potential impacts on individual farms were, however, voiced and include:

- Concerns over the impacts on avifauna, change of sense of place, long-term disruption to livelihoods (e.g. high-end tourism) and life (including homesteads and farm infrastructure) as well as short-term disruption to farm management (including safety concerns regarding use of gyrocopters near power lines). Suggestions were made to realign the power line away from established infrastructure (e.g. landing strips, graves) to minimise/ avoid impacts to livelihoods, as well as away from habitats that support sensitive avifauna (e.g. rare and endangered bird breeding sites and from their flight paths) and flora (e.g. forests). There was also support for the avifaunal specialist's recommendation to place the pylons close to the existing pylons, but in a staggered arrangement. Some landowners were concerned about the cumulative impacts of multiple power lines within a particular area (e.g. around the Substations).
- A number of specific mitigation measures/ management actions were proposed for investigation in the assessment phase.
- There was support for the proposed ESMPs for the construction and operational phases in order to mitigate potential detrimental impacts.

The details of these concerns and proof of consultation are attached in **Appendix E** to this report.

The detailed studies continued in response to the above concerns and are attached as **Appendix F** to this report.

Part of this work is specific ESMPs for the construction and operational phases, which include all of the proposed management actions/ mitigation measures recommended in the ESIA and its associated public consultation process. These Plans include an Avifaunal Monitoring Plan for the pre- and post-construction phases, in the Biodiversity Management Plan (BMP), detailed specifications for vegetation and flood management, as well as an archaeological chance find procedure.

An alternative route was subsequently proposed by the Bird Specialist, the Western route, to bring about staggering of pylons with the 400kV route and so avoid bird collisions.

9.2.2 2019 FEEDBACK

NamPower and the ESIA Team appointed in 2019 considered the alternative route and it was found that the eastern route has marginal environmental and social benefits compared to the western route (**see Section 2.2**). The latter servitude was selected as the preferred route because of technical considerations put forward by the Borrower.

The Draft Assessment Report was completed and circulated for review to the stakeholders, notably the effected farm owners on 11 November 2019. After this process it became apparent that some farm owners still objected to the position of the line on their farms. A follow up meeting was therefore arranged with these specific farm owners (refer to **Appendix E**). Most concerns were addressed by adjusting the route to avoid the sensitivities pointed out by the farm owners. In one instance, this was not possible due to cost implications, new impacts to other farm owners when moving the line, and the need to keep the line parallel to the existing one to avoid bird collisions. The details of this communication are contained in **Appendix E**.

9.2.3 2023 FOLLOW UP CONSULTATION

During the current update, the documentation with selected route was re-circulated, with an opportunity to attend focal meetings. Two meetings were held with stakeholders, including the leadership of the Kriess community where the transmission line passes relatively closely (250m). This meeting included particular engagement with the Nama community and Conservancy representatives. These engagements were aimed at gaging potential impacts of the project on the livelihood strategies of the Nama people. All those present confirmed that the project would not affect their activities due to the large extent of the communal area and the fact that the power line servitude will be far removed from any hunting activities, the latter which is limited in the affected conservancy. They were also satisfied that there will be land use restrictions in the servitude (not structures to be erected) but that grazing could continue unaffected, besides the narrow two-spoor access road required. Besides some technical questions and an encouragement to employ the local communities, there were no further comments on or objections to the Project.

A Background Information Document was also sent to the stakeholders of the BESS Project. To this end, no feedback has been received.

9.3 ENGAGEMENT DURING IMPLEMENTATION AND BEYOND

The Stakeholder Engagement Plan (**Appendix E**) requires that a Grievance mechanism be compiled for the project and this is contained in the ESMP. It also spells

out further steps to be taken to ensure continued stakeholder engagement during construction and operation of the transmission line.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 CONCLUSIONS

10.1.1 Route selection

The western route alternative which mostly follows the existing 400kV transmission line from Windhoek to Keetmanshoop, will cause marginally less environmental and social impacts than the eastern route alternative, which mostly runs parallel to the existing 220kV transmission line. This is mainly because the eastern alternative is slightly longer than the western route. However, overall the difference in impacts is considered marginal. By contrast, it is more difficult to mitigate the associated technical risks of having the two 400kV lines adjoining each other, and of having a line crossing. The eastern route avoids these risks as opposed to the western route. Since avoiding these interruptions is of national importance, and all specialists agreed that the marginally more significant impact assessment along the eastern route can be overcome with mitigation, the eastern route is supported.

10.1.2 Critical Habitat

It may be concluded from the Critical Habitat Assessment, that given all the criteria combined, the Karas Dwarf Shrubland and Dwarf Shrub Savanna are considered critical habitat. The **Ludwig's Bustard**, which is classified as Globally Endangered, according to the IUCN Red Data list of species and listed as Endangered on the Namibian Red List, prefers open grassland areas such as those found in the mentioned habitats. Within these habitats, the Hardap Dam is also an Important Bird Area and an important area for migratory species, namely the Great White Pelican. Even though the dam is some 10km to the west of the proposed route, birds in this habitat may be affected by the power line.

Even though these habitats are considered important habitats for Ludwig's Bustard, and other species of conservation concern, it is the presence of the power line as a physical barrier in the habitat, which poses the threat in terms of potential collisions, that needs to be addressed intentionally.

Biodiversity Risk Management (or mitigation) measures following a mitigation hierarchy approach have been considered in the Critical Habitat Assessment. The goals of No Net Loss and Net Gain should be set in the Biodiversity Management Plan.

A staggered design (i.e., the "staggering" or offsetting of pylons of the new 400 kV line with those of the adjacent 220 kV line) is being proposed, to increase the visibility of

the obstruction of the power line infrastructure to flying birds, and thus reduce the chances of collisions.

Since regional monitoring shows that current available mitigation, i.e. marking of lines to make them more visible, are ineffective for Bustards, this mitigation is considered a potential solution and as such it is anticipated that the number of bird deaths at a regional scale can be significantly reduced. This approach has not yet been proven, and will be applied as a trial to determine the effectiveness of staggering transmission lines to reduce bird collisions. It is proposed that, prior to construction, further studies, in addition to consultations with avifauna specialists, be conducted to refine this approach as a mitigation measure as part of the finalization of the design. This preparation period will also be used to refine the power line marking methods to be used, and as preparation of a robust monitoring plan in the BMP. A plan of study is being proposed to set the terms for this further work prior to construction.

The BMP will set out a short (pre-construction), medium (during construction) and long term (post-construction) monitoring programme. The BMP will in particular focus on the monitoring of key critical habitat areas, to assess the effectiveness of the mitigation measures that have been proposed thus far (staggering and line markers), with an aim to achieve Net Gain. A further aim of the monitoring is to assess local population numbers and trends of sensitive bird species (especially bustards) that are using these key critical habitat areas.

The BMP will contain the requirements for further, ongoing biodiversity monitoring during the operational phase, to evaluate how effectively the mitigation measures proposed are in achieving the Net Gain targets.

10.1.3 Impact assessment

The impact assessment carried out on the eastern route revealed the following significant effects:

- **Impact on vegetation:** Because of the linear nature of the project, the impact on vegetation is expected to be generally low. The loss of protected tree species, specifically the protected Camel Thorn rates medium and can be reduced to achieve a low significance with proper vegetation management. Appropriate mitigation is included in the Biodiversity Management Plan (BMP). No Critical Habitat (for vegetation) is affected on the Project.
- **Impact on birds:** The project area supports a relatively high diversity of red data species, including Vultures, Eagles, and Bustards that are particularly vulnerable to power line collisions. The main impact on birds will be bird strikes once the line is operational. The route has been aligned along an existing 220kV transmission line to minimise cumulative impacts. However, there still remain habitats that harbour sensitive red data bird species. Mitigation measures, which are a non-negotiable condition be implemented, namely staggering the 220kV with the 400kV pylons (to be the same height to increase the chance

of bustards seeing and clearing both lines), and where this staggering is not possible or ineffective after a period of monitoring, the line be marked with bird diverters. A rigorous monitoring programme, consisting of monitoring prior to, during and after construction. The exact mitigation and content of the BMP is to be refined with further studies before construction.

- **Social impacts:** The most significant impacts include disruption to farm management and changed sense of place. For some farmers the key impact will be during construction when the team interferes with and could potentially introduce nuisances on their farms such as noise, dust, security risk, poaching, etc. to their land. This impact will continue somewhat during operation when maintenance is carried out on the line. Some owners are concerned who already have a number of lines crossing their land. For some who place a high value on view sheds, their sense of place will change. These impacts are low generally for the entire route, but rated high to medium for some receptors.

NamPower has made significant effort to accommodate farm owners concerns in this regard, by making route adjustments where possible. Mitigation of potential nuisance and conflict on farms during construction and operation includes a well-planned management and communication protocol. There will be no resettlement or land take on this project. Land restrictions include that no structures be erected within the project servitude. Farms are generally large and used for grazing under the transmission line corridors. Grazing may continue without interruption. NamPower's efforts to compensate for the land restrictions are considered reasonable and do satisfy the World Bank's Environmental and Social Standard: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

The limited land use restrictions are expected to have a low impact on the Nama Traditional Local Community, considered an Indigenous People group according to the World Bank ESS7. Engagement with the group's representatives, including those of the !Khob !Naub Conservancy, confirmed this assessment. The conservancy is large, none of their settlements or structures will be affected and livelihood strategies will continue mostly unaffected. Continued engagement with this group is very important and recommendations have been made to limit impact on the community during construction. A recommendation is also made to include a social upliftment programme targeting the Nama community, into the project implementation.

- **Impact on archaeology:** Three sensitive sites have been discovered along the route, including one burial cairn, a grave and a graveyard. These are not directly on the route, but may be implicated during construction and operational activities in the area, particularly vehicles driving on the access track. The sites should either be marked and protected, or if this is not possible,

removed completely before construction commences. The impact on these sites is rated high and the careful consideration of how to protect them is crucial.

Other impacts, including impacts on labour, impacts related to waste, and community health and safety issues, have been assessed and should be addressed as part of the ESMP and the directives in the World Bank ESS.

10.1.4 Cumulative Impact Assessment

The cumulative impacts of the existing 220kV transmission line combined with the additional proposed 400kV transmission line were considered at a preliminary level. Impacts on the following Valued Environmental and Social Components (elements that are of value in the area), were assessed:

- a) Health of vegetation (particularly *Vachellia erioloba*): the two routes follow through the same hotpots for these trees, therefore cumulative numbers of trees are being removed. The impact is localised and does not threaten the overall survival of the population. This impact can be mitigated by implementing the Biodiversity Management Plan.
- b) Health of bird populations particularly those susceptible to power line collisions especially Ludwig's Bustard and Kori Bustard. The existing 220kV transmission line already causes significant bird mortalities annually. The 400kV line will add to this impact. By placing the two lines next to each other and staggering the pylons, the impact is most likely significantly reduced on both lines. Bird markings and monitoring is also crucial to mitigate the impact, as prescribed in the Biodiversity Management Plan.
- c) Visual quality as a tourism resource. Because of the increasing number of transmission lines, especially where there are tourism related activities existing or planned, this impact is a concern. Mitigation has been implemented by rerouting the line on the farms as far as possible, where this was raised as a concern.
- d) Social conditions on farms (specifically conflicts related to power line construction workers and maintenance teams) will likely be impacted. There is only one project foreseen. However, farm owners have had to deal with the related frustrations in the past, and this project will likely add to these frustrations. Another cumulative effect is the maintenance teams accessing the farms cumulatively to work on the multiple lines. Protocols for interactions on the farms have been included in the ESMP. The grievance redress mechanism is crucial in terms of dealing with conflict and management of maintenance teams on the farms.

10.2 RECOMMENDATIONS

In light of what can be concluded regarding the potential impacts associated with the proposed transmission line, NamPower will be able to reduce the significance of most of these to acceptable levels if they implement the mitigation measures outlined in both the Construction and Operational ESMP. The BMP, SEP and LMP also need to be implemented. A BMP will be prepared as according to the Plan of Study, in the biodiversity and critical habitat assessment report, to refine biodiversity mitigation and monitoring, particularly as it relates to avifauna impacts and monitoring. It is important that the ESMP is audited to ensure compliance and that monitoring takes place as outlined therein otherwise the impacts identified will remain unacceptable.

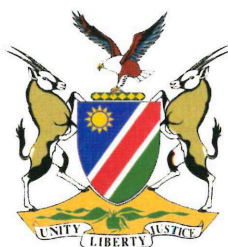
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REPUBLIC OF NAMIBIA
MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
 OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental
 Management Act (Act No. 7 of 2007)

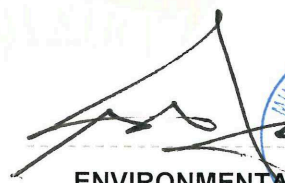
TO

**Namibia Power Corporation
 P O Box 2864, Windhoek**

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

**PROPOSED CONSTRUCTION AND OPERATION OF A 400Kv
 TRANSMISSION LINE FROM KOKERBOOM TO AUAS SUBSTATION,
 KHOMAS, HARDAP AND //KARAS REGIONS RESPECTIVELY**

Issued on the date: **2021-01-29**
 Expires on this date: **2024-01-29**


ENVIRONMENTAL COMMISSIONER
 MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM
 Private Bag 13306
 WINDHOEK, NAMIBIA
04 FEB 2021
 ENVIRONMENTAL COMMISSIONER
 REPUBLIC OF NAMIBIA

(See conditions printed over leaf)

This certificate is printed without erasures or alterations



CONDITIONS OF APPROVAL

1. This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office
2. This certificate does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from these activities. Instead, full accountability rests with the proponent and its consultants
3. This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project
4. All applicable and required permits are obtained and mitigation measures stipulated in the EMP are applied particularly with respect to management of ecological impacts.
5. Strict compliance with national heritage guidelines and regulations is expected throughout the life-span of the proposed activity, therefore any new archaeological finds must be reported to the National Heritage Council for appropriate handling of such.

Terms of Reference

**UPDATING OF ENVIRONMENTAL AND SOCIAL IMPACT
ASSESSMENT (ESIA) FOR KOKERBOOM-AUAS 400KV
TRANSMISSION LINE IN NAMIBIA.**



12 May 2023

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ACRONYMS AND ABBREVIATIONS

BMP	Biodiversity Management Plan
DC	Direct Current
ECC	Environmental Clearance certificate
EHSG	Environmental, Health and Safety Guideline
EHS	Environment, Health and Safety
EMF	Electro-Magnetic Field
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESF	Environmental and Social Framework of the World Bank
ESS	Environmental and Social Standards of the World Bank
FPIC	Free, Prior and Informed Consent
HVDC	High Voltage Direct Current
IFC	International Finance Corporation
ILO	International Labour Organization
IUCN	International Union for Conservation of Nature
LMP	Labour Management Plan
NGO	Non-government Organization
NTS	Non-technical Summary
PAH	Project Affected Households
PAP	Project-affected Person
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
SEP	Stakeholder Engagement Plan
ToR	Terms of Reference

1 BACKGROUND

NamPower intends to construct a 400kV power line from the Kokerboom Substation near Keetmanshoop to the Auas Substation about 40km from Windhoek. The line will cover approximately 500km from Auas Substation to Kokerboom Substation.

The proposed transmission power line is for the benefit of the Namibian electricity transmission backbone and Namibian economy. The expected Namibian electricity load growth together with possible transfer of power northwards, via the Zambezi Link Interconnector High Voltage DC (HVDC) scheme, requires this transmission line to be operational. Also, the number of cases where an outage of the existing 400 kV line can be accommodated (hence relying only on the 220 kV interconnector from South Africa) is becoming less and less each year as the Namibian electricity load grows.

There are two existing transmission lines connecting the Kokerboom and Auas Substations, a 400 kV and a 220 kV line, but this infrastructure alone is considered inadequate to meet the future power demands of the country. Therefore, NamPower has approached the World Bank to support the construction of a new 400 kV line between the Kokerboom and Auas Substations.

Two possible routes for the new 400kV line were considered.

The first possible route, shown as the white line in Figure 1, follows the existing 220 kV line to the east.

The second possible route, shown as the black line in Figure 1, follows the existing 400 kV line to the west.

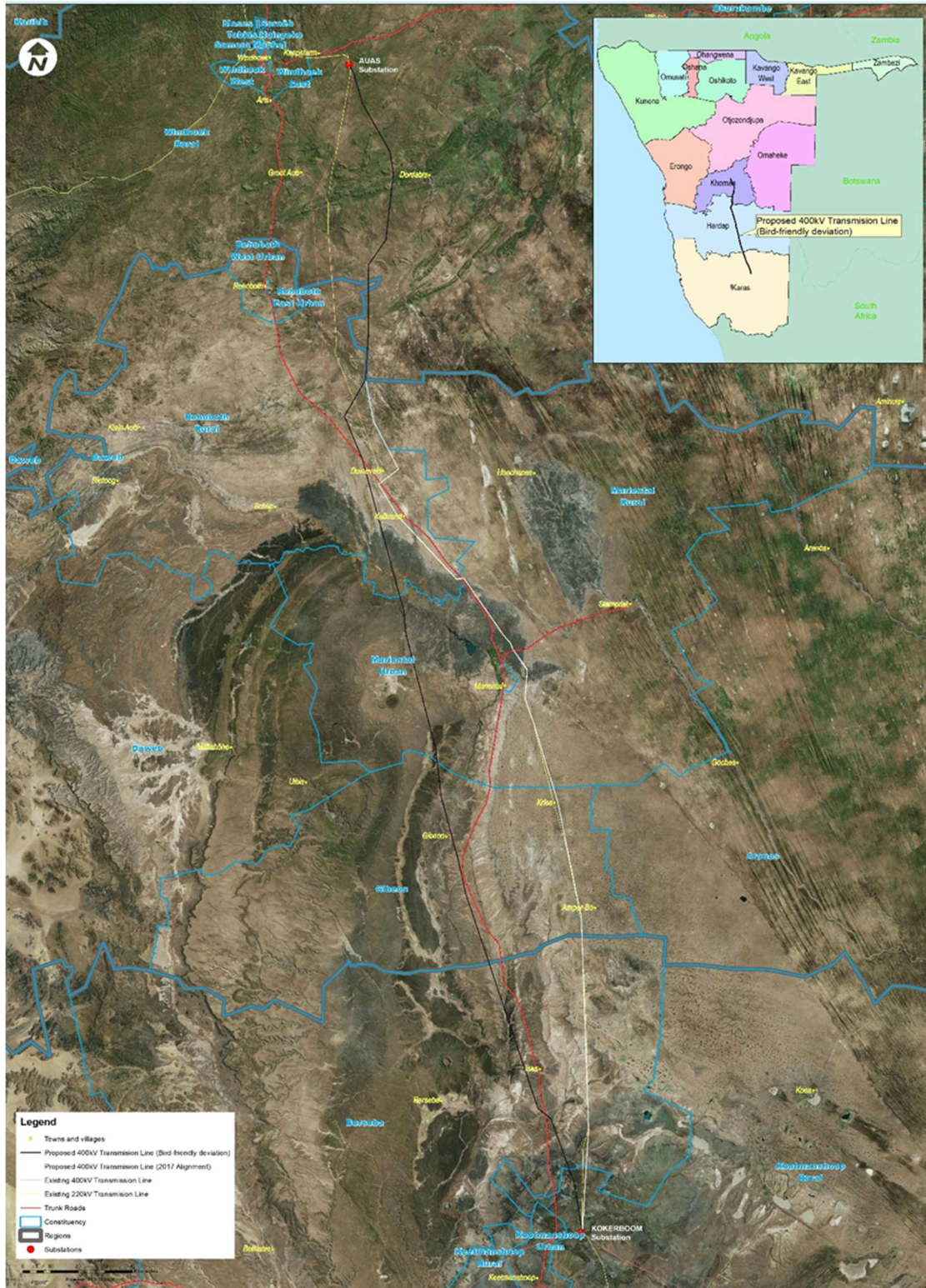


Figure 1: Locality Map of the proposed 400kV power line

There are three distinct vegetation types found along the transmission line corridor namely a) the Dwarf shrub Savanna; b) Mixed tree and shrub savanna of the Southern Kalahari biome and the c) Highland Savanna biome which host the highest plant diversity and endemism in Namibia. This biome contains both endemic and nationally protected species such as the Camel thorn tree and Shepherds trees found mostly along slopes of koppies and mountains. The Nama-Karoo and mixed trees and shrub savanna vegetation types are known habitats for bird species such as the Ludwig Bustard (Endangered), Kori Bustard (Near threatened) and White-

backed vulture (Critically endangered) among others. The preferred corridor alignment largely avoids mountain slopes which are susceptible to erosion and that support sensitive biota, in addition to current and future land use, infrastructure, and high value cultivated land.

The proposed transmission line corridor traverses three regions (namely Khomas, Hardap and //Karas). Khomas region is one of the most densely populated regions of Namibia; it is home to the national capital, Windhoek. Hardap and //Karas regions are geographically extensive regions with low levels of population density; large parts of these regions comprise the Namib and Kalahari deserts. The Project area is also defined by high levels of poverty, relatively low levels of access to infrastructure, and poor-quality rangelands. Livestock agriculture is the most dominant economic sector in the proposed Project area. Most of the employed population derive income as employees. There are no formal settlements located within the proposed 500 m corridor. The area is used for grazing (domesticated livestock and game) and some eco-tourism and hunting activities. There are some private residences and tourist facilities located near the proposed transmission line.

The proposed construction work to be carried out on the new 400kV power line includes:

- Site establishment, including site demarcation and fencing (temporary and only where required), layout and establishment of the contractor's camps including ablution and cooking facilities (this will only be established if required by the appointed Contractor);
- Bush clearing at pylon base sites and to facilitate access (where necessary), for construction and safe operation of the power line;
- Concrete batching by concrete batching plant, & transportation to site
- Excavation of holes for the concrete pylon base and foundations.
- Casting of concrete platforms for the pylons;
- Transportation of plant, machinery, and equipment to site.
- Transport of the conductor into position by means of a pulley system or by rolling large coils of conductor into position.
- Hoisting and lifting of the pylons into position.
- Stringing and regulation of the conductor.
- Construction of the access road.
- Rehabilitation of disturbed areas and erosion prevention,
- Temporary waste management
- Final inspection and handover for operation; and
- Rehabilitation of the site.

An Environment and Social Impact Assessment (ESIA) study was prepared in 2020, to meet the requirements of the Namibian environmental legislation and an Environmental Clearance Certificate (ECC) was obtained from the Ministry of Environment, Forestry and Tourism on the 29th of January 2021 and is valid till the 29th of January 2024. A Project Area of Influence of 500m either side of the transmission line was used in the 2020 ESIA to assess direct and indirect impacts associated with the Transmission line. For the purpose of the updating of the ESIA, a Project area of influence of 1km (500m either side of the transmission line) will be considered for the updating of the Critical Habitat Assessment. NamPower has submitted a request to the World Bank to fund the construction of the new 400 kV Kokerboom-Auas Transmission line. To meet the requirements of the World Bank Environmental and Social Framework (ESF) (2018), NamPower is required to update the existing 2020 ESIA. NamPower therefore seeks the service of a consultant to update the ESIA in line with the requirements of the World Bank ESF as set out in this Terms of Reference (ToR).

2 OBJECTIVES OF THE ASSIGNMENT

The objective of this consultancy is to update the ESIA report that was undertaken by Enviro Dynamics (2020) for the proposed project along with all relevant associated environmental and social instruments as set out in this ToR.

The Consultant shall ensure that the updated ESIA report complies with and meet the legal and technical requirements of Namibia and the World Bank. These, include the World Bank's requirements under the World Bank ESF (ESS1 to ESS10), World Bank Group's Environmental Health and Safety Guidelines, including EHS Guidelines (EHSG) for Electric Power Transmission and Distribution, and the World Bank Good Practice Notes (GPNs) on Labor influx and SEA/SH Gender Based Violence.

The Consultant shall ensure that all beneficial and adverse impacts associated with the construction and operation of the project, including all associated/ancillary works and linked activities if any, are assessed and taken into account.

The updated ESIA is expected to include the following (not an exclusive list): :

- A Critical Habitat Assessment according to the 5 Criterion described under paragraph 23, per ESS6, see Annex 1 (note that ESS6 also requires an assessment of the proposed infrastructures on modified and natural habitats). If potential adverse impacts are expected in critical habitats, the consultant will include a discussion on the extent of compliance with the seven conditions (a to g) as presented under paragraph 24, ESS 6 (see Annex 2).
- An analysis of alternatives of the possible routes. The alternative analysis should provide an overview of the main reasons and rationale for selecting the chosen option, including comparison of the environmental and social effects of each. The analysis should include the "do-nothing" option.
- A Cumulative Impact Assessment (cumulative environmental and social risks related to the existing servitude lines along the proposed route).
- An Environmental and Social Management Plan (ESMP). The ESMP shall include a Biodiversity Management Plan (BMP), a Labour Management Plan (LMP).
- A Stakeholder Engagement Plan (SEP) to identify potential stakeholders and beneficiaries such as the local governments, vulnerable and disadvantaged groups and their representatives, community leaders and representatives, civil society organizations (CSOs). Given that the proposed transmission line will go through an area of important biodiversity environmental protection agencies and NGOs should be identified. The SEP will include engagement strategy with these stakeholders to engage into meaningful consultation. The SEP will include measures to strengthen the existing grievance mechanism of NamPower to be aligned with ESS1 and ESS10 prescriptions.
- A retroactive land acquisition audit to ensure that previous acquisition was conducted without significant gaps and in line with ESS5 principles, if such retroactive land acquisition was indeed carried out in direct anticipation of the project.
 - An assessment of potential physical and/or economic resettlement accompanied with a description of the process for preparing site-specific RAP should such plan be needed.
 - Livelihood restoration measures to manage risks associated with right of way, and impacts associated with land use and tenure.
 - An assessment to determine presence or absence of Indigenous Peoples (as defined per ESS7 paragraph 8) and of the nomadic/pastoralist communities.
-

3 RELEVANT STANDARDS AND LEGAL REQUIREMENTS

To ensure that potentially negative environmental and social risks and impacts stemming from Project activities are minimized, and in order to strive to enhance benefits for local communities in the Project area, the Assignment will be conducted in accordance with the following Relevant Standards and Guidelines

- Namibian environmental laws and regulations.
- International Law including conventions and treaties adopted by Namibia and applicability to transmission and distribution Project.
- World Bank Environmental and Social Standards (ESS)¹ (and their associated Guidance Notes for Borrowers).
- The following WB Good Practice Notes:
 - Addressing sexual exploitation and abuse and sexual harassment in investment project financing involving major civil works (2020)²
 - Assessing and Managing the Risks of Adverse Impacts on Communities from Project-Related Labour Influx (2021)³
- EHS Guidelines of the World Bank Group, including:
 - The General EHSG⁴ and
 - Industry Specific EHSG for Electricity Power Transmission and Distribution
- The Fundamental Conventions of the International Labour Organization (ILO)
- Reducing avian collisions with power lines: the state of the art in 2012 (APLIC)⁵

As part of the assignment, the specific applicability of the requirements under each of these Legal Requirements, Standards and Guidelines needs to be evaluated and scoped out as appropriate, including the relevance and rationale and then referred to as “Relevant Standards”.

4 SCOPE OF WORK

The ToR aims to outline the tasks to be undertaken by the consultant in as much detail as possible. The Consultant shall ensure that it performs all necessary works and services in order to ensure the fulfilment of the outlined objectives and in so produce a high-quality fit-for-purpose ESIA for the Project.

It is anticipated that the Assignment will be undertaken through the following tasks:

- Task 1: Update ESIA including a critical habitat assessment and cumulative impact assessment
- Task 2: Update on ESS5 risks and impacts (including an audit of previous land acquisition to assess compliance with ESS5) and a set of livelihood restoration measures.
- Task 3: Prepare an ESMP, including BMP and LMP
- Task 4: Update on ESS7 risks and impacts

¹ <http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards>

² <https://thedocs.worldbank.org/en/doc/741681582580194727-0290022020/original/ESFGoodPracticeNoteonGBVinMajorCivilWorksv2.pdf>

³ <https://thedocs.worldbank.org/en/doc/fc074f5b6cc1621dc65675bf83c9d0b8-0290032021/original/ESF-Labor-Influx-Good-Practice-Note.pdf>

⁴ <https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final+-+General+EHSGuidelines.pdf?MOD=AJPERES>

⁵ https://www.aplic.org/uploads/files/15518/Reducing_Avian_Collisions_2012watermarkLR.pdf

- Task 5. Consultations and Stakeholder Engagement

The tasks are described in the sub-section below. Further details of the required scope and guidance on content and proposed methodologies are provided in the annexes to the ToR. If no guidance is given or the Tenderer would like to suggest a different approach (e.g., for a specific modelling approach), the proposed methodology shall be presented as part of the proposal.

4.1 TASK 1: UPDATE THE ESIA

NamPower will provide available existing and any updated information in regarding the project design, environmental and social aspects, as required by the consultant and other information which may be deemed relevant. The Consultant shall become familiar with the project information and relevant standards as listed in Section 3. The Consultant shall propose a kick-off meeting (or a kick-off-call, as appropriate) if the initial review of the documentation may cause any divergence in the assumed work plan or if any additional clarification or information is required in order for the consultant to complete the assessment.

The Consultant will carry out the necessary studies and processes culminating in an updated detailed ESIA Report including the ESMP and supporting documents consistent with the requirements of set out in Section 3

The following sub-sections outline which aspects should be covered by the ESIA at minimum.

4.1.1 Updated Project Description

The Consultant shall review the current project description and produce a concise and comprehensive updated project description, where relevant, supported by maps, plans, graphs and charts to provide an easy and structured overview. The description shall be based on information on existing and updated project reports and documents and shall cover both activities associated with the Transmission line and any minor works to take place within the existing substations funded under the project (if any). The level of detail of the project description shall be commensurate with potential project effects on the receiving environment. This may include nature and quantity of the materials and natural resources (including water) to be used and approximate number of work force that will be involve at the peak of the project etc.

4.1.2 Description of the legislative and regulatory framework and requirements, including a gap analysis with international standards

The Consultant shall provide a comprehensive and appropriately detailed updated description of the Namibian legislative requirements and framework relevant to the Project (i.e., describing the key laws, regulations, or ordinances etc. in the area of environment, social aspects such as physical and economic resettlement, indigenous peoples, cultural heritage, stakeholder engagement, consultation requirements, labor conditions and occupational health and safety).

The legislative framework should identify relevant environmental and socio-economic legal requirements (laws) applicable to the assessment and to be adhered to within project implementation (e.g., related to air emissions, impact on watercourses, wastewater discharge, noise, protected species etc.). This may also include internal requirements which NamPower has to follow (referred to as borrower framework). Additionally, the Consultant shall briefly describe the relevant international environmental and social obligations of the country (such as the Convention on Migratory Species as an example and the ILO Fundamental Conventions) , as relevant to this project, as well as details of the international environmental and social

standards, guidelines and Good Practices Notes which are referenced for the Project in Section 3.

The legislative framework shall also include a description of gaps between national legislation and the applicable ESSs. The Consultant shall develop a structured gap analysis to present the gaps between the national legislation and the ESSs requirements. Based on the analysis the Consultant will provide measures and recommendations to bridge the gaps.

4.1.3 Updated Baseline Information and impact assessment

The consultant shall undertake a review of the baseline data presented in the ESIA completed in 2019 and applicable specialist studies and evaluate relevance and accuracy of the data and its consistency with meeting the requirements of the World Bank ESS and identify actions to be taken to update the baseline information.

Based on the consultant's review and gaps identified the Consultant shall collect, collate and present the updated baseline information on the natural (biological and physical) and human environments (social, cultural and economic) of the study area by qualified experts. Where relevant the baseline description shall be derived from both secondary sources and fieldwork to collect primary data and should be inclusive of, but not be limited to:

- Physical environment (geology, ground topography, climate, air quality, surface and groundwater etc.);
- Biological environment (i.e., flora and fauna types and diversity, endangered species⁶, sensitive habitats⁷, ecosystem services etc.);
- Social and cultural environment, including present and projected (i.e., demography, population, land use, planned development activities, infrastructure facilities/community social structures, employment and labor market, sources and distribution of income, cultural/religious sites and properties, vulnerable groups and indigenous populations, nomadic/ pastoralists communities, cultural heritages, infrastructure and basic social services.);
- Economic activities (agriculture, livestock, industries, tourism etc.);

While the full scope of the coverage for updating the ESIA will be confirmed by the consultant, the following key issues should be addressed:

- Assess potential impacts on worker health and safety and provide mitigations as part of the ESMP to guide the preparation of an Occupational Health and Safety Plan consistent with ESS 2 and World Bank ESHGs during project implementation.
- Assess potential impacts on community health and safety (ESS 4) associated with the construction of the transmission line, for example impacts associated with electro-magnetic fields (EMF), increase in movement of construction vehicles and potential influx of labor and risks associated with SEA/SH etc. and provide mitigation measures as part of ESMP.
- Assess the water needs of the project and determine any impacts the project water requirements may have on surrounding ecosystems and communities, if any, and propose feasible mitigation measures for optimizing water efficiency as part of the ESMP.
- Assess impacts associated with the generation of waste (hazardous and non-hazardous) and handling and storage of hazardous substances.

⁶ According to the IUCN Red List of Threatened Species and the national List.

⁷ The habitat characterization should also specify if it falls into a modified, natural or critical habitat definition per ESS6.

- Fragmentation, degradation or loss of natural habitat including critical natural habitat from direct construction and/ or operation. This should include, in particular, impacts to the conservation area; natural habitats including migratory/movement routes of birds, stopovers points for migratory birds, nesting areas, other wildlife species, ecological corridors and impacts on the sensitive areas, such as wetlands, rivers etc. in the project area of influence. To the critical habitat assessment, the project Area of Influence is set at a 1km buffer (500m either side of the transmission line). The Consultant will be required to prepare a Critical Habitat Assessment to determine impacts on both identified protected bird and tree species (IUCN listed, Endangered and Critically Endangered and locally protected). The assessment should also capture if any natural habitats are present.
- Based on the findings of the critical habitats assessment, the consultant will prepare a Biodiversity Management Plan which shall include at a minimum the following elements:
 - A summary of the critical habitat assessment screening and if potential adverse impacts in areas of critical habitat (as defined under paragraph 23, ESS6) are expected to occur due to any project activities. If potential adverse impacts are expected in this type of habitats, the consultant will include a discussion on the extent of compliance with the seven conditions (a to g) as presented under paragraph 24, ESS 6 (see Annex 3);
 - A description of the potential measures consistent with the mitigation hierarchy⁸ to address impacts and risks on the habitats, the birds (both migratory and residents), the terrestrial fauna and the bats (if applicable). The mitigation measures presented shall be breakdown according to the main project stages e.g., design, construction and operation. For instance, in the design stage one of the key measure to avoid impacts start with the selection of the route with a lesser biodiversity value and/or the route with the less expected anticipated impacts.
 - Identification of the responsible parties for the implementation of the measures and this by taking into account all stages of the project (design, bidding documents, contract, construction, and operation);
 - A preliminary budget for the proposed measures (including cost of all the devices (for instance if bird flappers are recommended, anti-perching devices, spirals, etc), installation, maintenance, follow-up and monitoring (for example the post-construction survey of carcasses during operation is a mitigation measure that will have a financial cost);
 - A description of the monitoring procedures recommended including a list of preliminary biodiversity indicators
 - If the findings of the field survey and subsequent data analysis indicate that significant residual impacts may remain, and this, despite the implementation of mitigation measures, the consultant will propose a strategy to compensate for those impacts or offset them.
- Land Management and Tenure section should be updated to include the following: (i) nature of impacts (i.e. will there be land acquisition, economic impacts on livelihoods during or after construction is completed; and/or physical resettlement); (ii) if yes, what will be the processes to acquire land, including with regard to consultations, cut-off date to identify eligible individuals/farms, and compensation payments to affected peoples. ESIA should have a section on with audit of any recent land acquisition that was done in direct anticipation of the project financed by WB. The audit should be a benchmarking exercise to assess previous land acquisition against ESS5 requirements.

When assessing the impacts and risks, the Consultant shall consider both the positive and negative environmental and social impacts (direct, indirect and cumulative, temporary and permanent) potentially stemming from the Project. This should include impacts in terms of magnitude, significance, reversibility/potential for mitigation, extent, duration (major, moderate, minor and negligible impacts) during the pre-construction, construction and operation/

⁸ Paragraph 27, ESS1, WB: The environmental and social assessment will apply a mitigation hierarchy which will : a) anticipate and avoid risks and impacts; b) where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels; c) once risks and impacts have been minimized or reduced, mitigate; and d) where significant residual impacts remain, compensate for or offset them, where technically and financially feasible.

maintenance phases as well as for decommissioning or closure and reinstatement. For each impacts assessed, a determination if residual impacts will persist should be made.

The consultant shall further assess the potential cumulative impacts associated with the transmission line following the methodology set out in the Cumulative Impact Handbook published by the IFC⁹. In line with this Handbook, the valued environmental components (VECs) selected should be consulted and validated by the stakeholders.

Working in collaboration with NamPower, other responsible institutions, agencies, organizations and representatives of affected groups, the Consultant will identify and develop realistic and cost-effective mitigation measures, in line with the mitigation hierarchy approach (as defined under ESS1 paragraph 27), for significant adverse environmental and social impacts and residual impacts. These measures will cover all aspects and phases of the project and may include, but are not limited to, changes in the project's footprint, design details and operating procedures, land management, social support, institutional development and capacity building for both government and civil society organizations as may be deemed relevant.

The ESIA report shall be presented in a logical and clear format and include an assessment of the impacts prior to and following the implementation of mitigation measures. It should identify constraints associated with the mitigation methods recommended and allow provision for modification.

4.1.4 Assessment of Alternatives

A systematic identification and consideration of feasible alternatives to the Project in terms of location, technology, design and scale in terms of potential environmental and social impact shall be compiled. Specifically, the alternative analysis should provide an overview of the main reasons and rationale for selecting the chosen option, including a comparison of the environmental and social effects. The analysis should include the 'do-nothing' option. Mitigation and compensation measures should be considered when assessing alternatives, both with a view to strengthening the feasibility of the Projects, and to improving the Project's design. The Alternative Assessment chapter shall contain a description of the reasonable alternatives that were assessed and an indication of the main reasons for selecting the chosen option with regards to their environmental and social impacts and risks.

4.1.5 Preparation of a Non-Technical Summary (NTS)

The Consultant shall compile and include an easy-to-understand NTS of the updated ESIA and stakeholder engagement no longer than 10 pages. The NTS will serve to inform the public and other interested parties of project activities. The NTS shall be in the form of a concise, standalone document and should include:

A concise summary description of the proposed project.

- i. The rationale for the proposed project.
- ii. A short summary description of the environmental and social baseline;
- iii. Any significant environmental and social impacts, issues or opportunities.
- iv. A summary of key aspects of the ESMP.
- v. Residual risks/issues and material information gaps or the need for further studies should be highlighted.

⁹ International Finance Corporation. 2013. *Cumulative impact assessment and management guidance for the private sector in emerging markets: Good practice handbook*. World Bank Group, Washington, DC, USA. www.ifc.org

- vi. A summary of stakeholder consultation held and further activities, information about availability of grievance mechanism and contact details for further information.

Deliverables Task 1:

- Updated ESIA

4.2 - TASK 2: UPDATE ESIA ON ESS5

4.2.1 Assessment of ESS5-related risks and impacts

The project will likely to require application of ESS5 on Involuntary Resettlement, and given that the project sites are known before appraisal, a site-specific Resettlement Action Plan (RAP) or Abbreviated Resettlement Action Plan in accordance with ESS5 will have to be prepared as a separate document. Any required ESS5 documentation on resettlement and/or land acquisition should be prepared in parallel with the ESIA and an expert on resettlement/land acquisition should be included in the team. At minimum, ESS5 is deemed as applicable if: a) the project will require labor camps/temporary resettlement during construction; b) if anyone may lose income as a (direct) result of the project, (probably not likely); and c) if additional associated infrastructure, will result in the acquisition of private land. The early findings of the ESIA should also include section with resettlement audit, if applicable, of any prior land acquisition that was carried out by NamPower in direct anticipation of the project to be financed by the WB. In addition, if the new line will likely have a servitude, this may add up to the servitude of the existing transmission line that is following the proposed line. Such cumulative social impacts should be assessed in the ESIA and inform measures to be proposed by RAP.

- A retroactive land acquisition audit to ensure that previous acquisition was conducted without significant gaps and in line with ESS5 principles if such retroactive land acquisition was indeed carried out in direct anticipation of the project.
 - An assessment of potential physical and/or economic resettlement accompanied with a description of the process for preparing site-specific RAP should such plan be needed.
 - Livelihood restoration measures to manage risks associated with right of way, and impacts associated with land use and tenure.

Deliverables Task 2

- An assessment of potential physical and/or economic resettlement accompanied with a description of the process for preparing site-specific RAP should such plan be needed.
- A retroactive land acquisition audit to ensure that previous acquisition (if any) was conducted without significant gaps and in line with ESS5 principles, if such retroactive land acquisition was indeed carried out in direct anticipation of the project.
- Livelihood restoration measures to manage risks associated with right of way, and impacts associated with land use and tenure.
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4.3 TASK 3: PREPARATION OF THE ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

Based on the results of the ESIA, the Consultant shall prepare an Environmental and Social Management Plan (ESMP) that compiles the impacts and required mitigation measures as identified in the ESIA, as well as the monitoring requirements to ensure that the identified measures are implemented, and any unforeseen impact is identified and handled aligned with the ESMP.

The ESMP shall align with the requirements of the indicative outline provided in ESS 1:

- details on specific management plans that will be required.
- a table of the commitments based on the mitigation measures identified, which should include details on:
 - the anticipated objectives or target of each measure,
 - related milestones, time frames and estimated costings
 - reporting requirements as well as
 - required resources (competencies, human resources, required equipment, materials and budgets required for the implementation of this commitment).
- Details on appropriate monitoring activities taking into consideration the parameters set out in the World Bank ESHGs where relevant, to ensure that (a) mitigation measures are effective, (b) unforeseen negative impacts or trends are detected and addressed, and (c) expected project benefits or opportunities are achieved. Indicators should be aligned to elements of the existing pre-project baseline and be (a) Specific, (b) Measurable, (c) Achievable; (d) Relevant and (e) Time-bound.

Also, the Consultant shall include a precise and specific action plan, detailing required training (technical assistance, equipment and supplies, organizational changes) for the management and monitoring of environmental and social impacts as well as corresponding costs. Where significant residual impacts remain after application of mitigation measures, the Consultant shall propose measures to compensate/offset the identified impacts. The ESMP shall be clearly structured and should cover all Project phases.

The ESMP should further include provisions or guidance for the preparation of the Construction Environmental and Social Management Plan, including guidance for the preparation of specific plans, during project implementation, including but not limited to the following, Occupational health and Safety Management Plan, Emergency Preparedness and Response Plan, Community health and safety plan, Waste management plan, Hazardous substances management plan and a chance finds procedure etc. As part of the ESMP, the Consultant will prepare a Biodiversity Management Plan consistent with the requirements stipulated in section 4.1.3) and Labor Management Plan, which will need to be disclosed with the updated ESIA and ESMP.

Deliverables Task 3:

- Updated ESMP
- Biodiversity Management Plan
- Labor Management Plan

4.4 TASK 4: ASSESSMENT OF ESS7 RISKS AND IMPACTS

The updated ESIA should include the following elements related to ESS7 risks and impacts (including in relation to nomadic/pastoralist communities as defined under ESS7, ft. 8), as applicable: 1. A review of the legal and institutional framework applicable to IP/SSAHUTLC. 2. Gathering of baseline data on the demographic, social, cultural, and political characteristics of the IP/SSAHUTLC; the land and territories within the project areas that they may have been traditionally owned or customarily used or occupied; and the natural resources on which they depend. 3. Taking the review and baseline data into account, the identification of project-affected parties and the elaboration of a culturally appropriate process for involving and consulting with the IP/SSAHUTLC (see paragraph 23 of ESS7). 4. An assessment, based on meaningful consultation tailored to IP/SSAHUTLC, of the potential adverse and positive effects of the project, as applicable. e. The identification and evaluation of measures necessary to avoid adverse impacts, or if such measures are not feasible, the identification of measures to minimize, mitigate, or compensate for adverse impacts on IPs, if any.

Deliverables Task 4:

- | |
|---------------------------------------------------------------------------------------------------------------------------|
| <ul style="list-style-type: none">- Assessment of ESS7 risks and impacts to be included in the updated ESIA |
|---------------------------------------------------------------------------------------------------------------------------|

5 CONSULTATIONS AND STAKEHOLDER ENGAGEMENT

The updated ESIA will have analysis of consultations to be held during preparation and inform preparation of a Stakeholder Engagement Plan as a separate document. In particular, updated ESIA will: 1. Identify all affected people (e.g. people affected by construction activities and during operation) and will facilitate dissemination of information to relevant authorities and interested and affected parties concerning the proposed. Project NGOs and government departments and agencies that may have a stake in the Project and its effects should be consulted. 2. Describe a schedule for public consultation with these different groups, including number and timing of public input, and the methods to be employed (e.g., media announcements, town hall meetings, questionnaires, one-on-one meetings, public EA steering committees). Public consultation should occur, at least, during the inception and collection of baseline information, and at the draft report stage. There has to be a specific consultation focused on Valued Environmental Components, in line with the Cumulative Impact Handbook published by the IFC. An annex of ESIA should summarize the public consultation process and the results of the consultation process. 3. Gather more detailed information through which the study team could anticipate issues not raised by the IAPs that will be addressed by the environmental impact assessment report. 4. Inform preparation of Stakeholder Engagement Plan, which is an inclusive process conducted throughout the project life cycle and a key aspect of any ESIA process. Given that the proposed transmission line will go through an area of important biodiversity, environmental protection agencies and NGOs should be identified. The SEP will include engagement strategy with these stakeholders to engage into meaningful consultation. The SEP will include measures to strengthen the existing grievance mechanism of NamPower to be aligned with ESS1 and ESS10 prescriptions. A transparent engagement between the NamPower and project stakeholders is an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation. Stakeholder Engagement of the Project shall be aligned with ESS10 and Namibian requirements.

Deliverables Task 5:

- | |
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| <ul style="list-style-type: none">- Carry out and update ESIA based on at least two rounds of consultations with stakeholders, and inform preparation of SEP as a separate document in line with ESS10 |
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6 DISCLOSURE REQUIREMENTS

The consultant shall ensure that its work program for updating the ESIA and ESMP takes into consideration the World Bank internal review and clearance timeframes (10 working days) and the final disclosure date of **17 August 2023**.

7 SCHEDULE

The completion of all deliverables is expected by July 2023, to allow World Bank opportunity to make an investment decision.

Interim milestone dates include:

Draft updated ESIA (Task 1) and ESMP (Task 3) for Bank Review - 26 June 2023

Final ESIA, ESMP, BMP and LMP for Bank review, clearance for disclosure – 20 July 2023

8 STAFF AND QUALIFICATION

The project team and their qualifications have to reflect the scope of services and show excellent technical and professional qualifications. The Consultant will ensure that appropriately qualified experts are available, as required, for each of the tasks outlined above.

The following experts should form part of the ESIA team as a minimum:

1. ESIA Team Lead

The proposed expert shall have at least a master's degree in environmental science, environmental engineering or in a related environmental discipline and at least 10 years of experience in Environmental and Social Impact Assessment, thereof at least 5 years as a Principal Specialist. S/he shall have performed EIA/ESIA/SEA studies for IFIs, be fluent in English and it is preferable that s/he has prior experience working in the region.

2. ESIA (environmental) expert

The proposed expert shall have at least a master's degree in environmental science, environmental engineering or in a related environmental discipline and at least 8 years of experience in Environmental and Social Impact Assessment. S/he shall have performed EIA/ESIA/SEA studies for IFIs, be fluent in English and it is preferable that s/he has prior experience working in the region.

3. ESIA (social) expert

The proposed expert shall have at least a master's degree in social science or similar with at least 10 years of experience in consultancy, preferably in EIA/ESIA and economic analysis of infrastructure projects preferably including Transmission and Distribution projects. Prior experience working in the region and fluency in English and at least one of the predominant local languages of the project area.

4. Biodiversity Specialist

The proposed expert shall have at least a master's degree in ecology with at least 10 years of experience in consultancy. Prior experience working in the region and experience with transmission and distribution line projects and preparation of biodiversity management plans are essential and it is preferable that she/he is fluent in English.

5. Avi-fauna Specialist

The proposed expert shall have at least a master's degree in Zoology with a specific focus in avi-fauna with at least 10 years of experience in consultancy. Prior experience working in the region and experience with transmission and distribution line projects and preparation of biodiversity management plans are essential and it is preferable that she/he is fluent in English.

6. Cultural Heritage Specialist

The proposed expert shall have at least a master's degree in archaeology or other relevant qualification with at least 10 years of experience in consultancy. Prior experience working in the region and fluency in English are essential.

ANNEX 1: GUIDANCE ON THE PREPARATION OF AN STAKEHOLDER ENGAGEMENT PLAN AND PLANNING OF STAKEHOLDER ACTIVITIES

Information to be provided by a SEP

The SEP shall contain information on the following (at least but not limited to):

- **Background information:** Overview of the proposed Project design and its activities during the different project stages (planning, construction, operation, maintenance), its purpose, costs and financiers;
- **Public consultation regulations and requirements:** Description of national regulations and requirements as well as international Standards and international Best Practice. Where ever there are gaps between national and international requirements, the most stringent will be applied;
- **Previous public consultation and disclosure activities:** Summarize all public consultation and information disclosure activities to date. This should include the types of information disseminated, the locations and dates of meetings, descriptions of those individuals/groups involved. An overview of issues discussed, how they were responded to and how they were communicated back to the concerned publics.
- **Stakeholder identification:** The first step of the stakeholder engagement activities is the identification and characterization of the Project stakeholders. In this regard, provide an inventory of key stakeholder groups who were/will be informed and consulted about the project. This would include authority, local communities, landowners, civic organizations, Non-Governmental Organizations (NGOs) and Community Based Organizations (CBOs) and government representatives as well as take into account power/influence relations and inter- and intra- social dynamics across all stakeholders, identifying under-represented and vulnerable groups. The identified stakeholders shall be compiled in a list.
- **Stakeholder planning:** The SEP shall describe the engagement planning activities to be undertaken. The planning activities should define the goals of the SEP, its methods for information disclosure and consultation, including appropriate communication methods (culturally appropriate and relevant language(s)), timing and activities for stakeholder engagement as well as the issues to be presented based on the ESIA study. Also, a schedule detailing when public consultation and information disclosure will occur, with which stakeholder groups, at what stages of the project's process/project cycle, and through what formats will be provided.
- **Stakeholder documentation:** The Tenderer shall prepare the necessary documentation required for engagement activities. This will include a Background Information Document (BID), presentation for use at stakeholder meetings, advertisements and notices as well as maps, pictures and posters as required.
- **Stakeholder interactions:** including meetings, provision of information, advertisements, notices, radio and TV advertisements.
- **Reporting:** The results of the stakeholder interactions should be summarized within the Scoping Report and ESIA Reports. The issues raised should be listed and grouped, and the ESIA should demonstrate how these issues have been addressed within the ESIA. Additional Annexes (e.g. stakeholder register, consultation log, grievance forms...) should be included.
- **Grievance Procedure:** If not in place, a Grievance Mechanism must be set up that is scaled to fit the level of risks and impacts of the project. It should fit and be integrated into the PEA broader process of stakeholder engagement. It is important that the process is accessible, transparent and tracked through a form of records of each grievance and complain. (see details below)
- **Monitoring, reporting and review:** Monitoring activities for review of the stakeholder engagement activities and the need for updating of the SEP through a management of

change process. Identify where and when the results of public consultation and information disclosure will be reported. This should include at a minimum reporting on the results of consultations at the draft ESIA stage and annual monitoring reports.

- **Resource and Responsibilities:** The staff and resources that will be required to implement and manage stakeholder management activities and how it will be integrated in the current management activities.
- **Disclosure:** The stakeholder engagement activities should include sufficient disclosure of Project information, including release of the Scoping Report and ESIA Report.

General scope of the Grievance Mechanism

- 1) The scope, scale and type of grievance mechanism required will be proportionate to the nature and scale of the potential risks and impacts of the project.
- 2) The grievance mechanism may include the following:
 - (a) Different ways in which users can submit their grievances, which may include submissions in person, by phone, text message, mail, e-mail or via a web site;
 - (b) A log where grievances are registered in writing and maintained as a database;
 - (c) Publicly advertised procedures, setting out the length of time users can expect to wait for acknowledgement, response and resolution of their grievances;
 - (d) Transparency about the grievance procedure, governing structure and decision makers; and
 - (e) An appeals process (including the national judiciary) to which unsatisfied grievances may be referred when resolution of grievance has not been achieved.
- 3) The PEA may provide mediation as an option where users are not satisfied with the proposed resolution.

Exemplary Table of Content of a SEP

The following exemplary table of content shall be used or amended accordingly to the impacts and risks of the Project

1. Introduction

- 1.1 Project Description
- 1.2 Public Consultation and Project Design, Construction and Operations
- 1.3 Project Purpose and Objectives
- 1.4 Total Project Cost and Associated Financiers and Lenders

2. Public Consultation Regulations and Requirements

- 2.1 Local Regulations and Requirements
- 2.2 International Best Practice

3. Previous Public Consultation and Disclosure Activities

- Summarize all public consultation and information disclosure activities to date. This should include the types of information disseminated, the locations and dates of meetings, descriptions of those individuals/groups involved.
- An overview of issues discussed, how they were responded to and how they were communicated back to the concerned publics.

4. Stakeholders

- Provide an inventory of key stakeholder groups who will be informed and consulted about the project.
- Account for inter- and intra- social dynamics across all stakeholders, identifying under-represented and vulnerable groups.

5. Stakeholder Engagement Plan

5.1 Goals of the Plan

5.2 Methods for Information Dissemination and Public Consultation

5.3 Information Disclosure and Public Consultation

5.3.1 Issues Scoping

5.3.2 ESIA Review

5.3.3 Construction and Operations

6. Schedule and Timetable

- Provide a schedule detailing when public consultation and information disclosure will occur, with which stakeholder groups, at what stages of the project's process/project cycle, and through what formats.

7. Resources and Responsibilities

- Indicate budgets allocated to the realisation of all activities foreseen in the Plan
- Indicate management and expert staff devoted to, and responsible for, the public consultation and disclosure programme.

8. Grievance Mechanism

- Describe how the operation- affected people can bring their concerns to the project authority and how they will be considered and addressed.

9. Monitoring and Reporting

Identify where and when the results of public consultation and information disclosure will be reported. This should include at a minimum reporting on the results of consultations at the draft ESIA stage.

Guidance for the implementation of stakeholder engagement activities

Stakeholder Engagement activities may be but not be limited to:

- Gathering of all the people concerned by meaningful means (publication of an open invitation in local newspapers, radio, etc. and specific invitations in collaboration with adjacent communities) and at least two weeks in advance of each meeting. The nature, frequency, and number of the engagement meetings (if required separate meeting for different stakeholder groups to facilitate participation) shall be determined by the Tenderer as appropriate for the project nature and context;
- Every effort should be taken to include broad representation from all stakeholder groups with particular attention to include potentially marginalized or vulnerable groups;
- Presentation of the project during the meeting with adapted and appropriate languages;
- The Tenderer will have to present the project in the less technical way, and the nearest to the population's concerns;
- The presentation should include a clear summary of the main information contained in the ESIA, and especially the information related to potential positive or negative impacts of the project and the measures to be implemented to avoid, mitigate or compensate harmful consequences of the project on the human and natural environment. It should also contain a situation plan detailing the borders of the predictable area impacted by the Project.
- Organization of a debate session to answer the questions raised by people attending the meeting; and
- Efforts should be made to accurately and thoroughly document the meeting attendees, their affiliation, gender, profession, views and concerns as well as all questions and answers and signed attendance sheet.

In addition, the Tenderer should note the following in the preparation of the proposal for this work:

- Stakeholder engagement activities need to satisfy host country legal requirements, guidelines and formats.
- Engagement meetings will be well advertised, at least two weeks in advance of each meeting. The communication mechanisms shall be culturally appropriate and be defined within the Tenderers proposal.
- Every effort should be taken to include broad representation from all stakeholder groups with particular attention made to include potentially marginalized or vulnerable groups such as women and lower income groups. Efforts should be made to accurately and thoroughly document the meeting attendees, their affiliation, gender, profession, views and concerns.
- The nature, frequency, and number of the engagement meetings shall be determined by the Tenderer as appropriate for the Project nature and context.

Annex 2 – Five Criteria of a Critical Habitat

WB ESF- ESS 6 Paragraph 23. Critical habitat is defined as areas with high biodiversity importance or value, including:

- (a) habitat of significant importance to Critically Endangered or Endangered species, as listed in the IUCN Red List of threatened species or equivalent national approaches.
- (b) habitat of significant importance to endemic or restricted range species.
- (c) habitat supporting globally or nationally significant concentrations of migratory or congregatory species.
- (d) highly threatened or unique ecosystems.
- (e) ecological functions or characteristics that are needed to maintain the viability of the biodiversity values described above in (a) to (d).

Annex 3 – Conditions for implementing projects in a Critical Habitat

WB ESF- ESS6, paragraph 24: In areas of critical habitat, the Borrower will not implement any project activities that have potential adverse impacts unless all the following conditions are met:

- (a) *No other viable alternatives within the region exist for development of the project in habitats of lesser biodiversity value.*
- (b) *All due process required under international obligations or national law that is a prerequisite to a country granting approval for project activities in or adjacent to a critical habitat has been complied with.*
- (c) *The potential adverse impacts, or likelihood of such, on the habitat will not lead to measurable net reduction or negative change in those biodiversity values for which the critical habitat was designated;*
- (d) *The project is not anticipated to lead to a net reduction in the population of any Critically Endangered, Endangered, or restricted-range species, over a reasonable time period.*
- (e) *The project will not involve significant conversion or significant degradation of critical habitats.*
- (f) *The project's mitigation strategy will be designed to achieve net gains of those biodiversity values for which the critical habitat was designated; and*

- (g) A robust and appropriately designed, long-term biodiversity monitoring and evaluation program aimed at assessing the status of the critical habitat is integrated into the Borrower's management*



Photographs 1 and 2: Auas Substation near Dordabis.



Photograph 3: Aerial view of Auas Substation near Dordabis.

Photograph 4: Existing 200 kV transmission power line between the Kokerboom and Auas Substations.



Photographs 5 and 6: View of the existing 400 kV transmission power line where it crosses the national road.



Photograph 7: Aerial view of Kalkrand town, which is in the vicinity of the proposed centreline of the transmission line alignment.

Photograph 8: Aerial view of landscape between Kalkrand and Kokerboom Substation.



Photographs 9 and 10: Kokerboom Substation near Keetmanshoop.



Photograph 1: A 400 kV transmission line with Guyed Compact Cross-Rope Suspension Towers. This illustrates what the proposed Kokerboom to Auas transmission line will look like in the straight sections of the alignment, where servitude constraints are not an issue.



Photograph 2: Strain Tower, to be constructed at bend points (of up to 60 degrees).



Photograph 3: Example of a Self-supporting Suspension Tower which would to be constructed within selected sections of the proposed Kokerboom to Auas transmission line, where the Guyed Compact Cross-Rope Suspension Tower would be impractical (eg at turning points and where there are servitude constraints).

Nov
2023

Environmental and Social Impact
Assessment for the Proposed 400 kV
Transmission Line from Auas to
Kokerboom Substation

DRAFT

STAKEHOLDER ENGAGEMENT PLAN
November 2023



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PROJECT NAME	Proposed 400kV Transmission line from Awas to Kokerboom Substations ESIA and ESMP
REPORT	Stakeholder Engagement Plan and Report
STAGE OF REPORT	Final
CLIENT	NamPower Attention: Martin van der Merwe
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1 INTRODUCTION

NamPower intends constructing a 400kV power line from the Awas Substation near Dordabis to the Kokerboom Substation near Keetmanshoop, Namibia. The line will assist in securing the supply of electricity to Namibia in future and open up opportunities for selling power to the Southern African Power Pool.

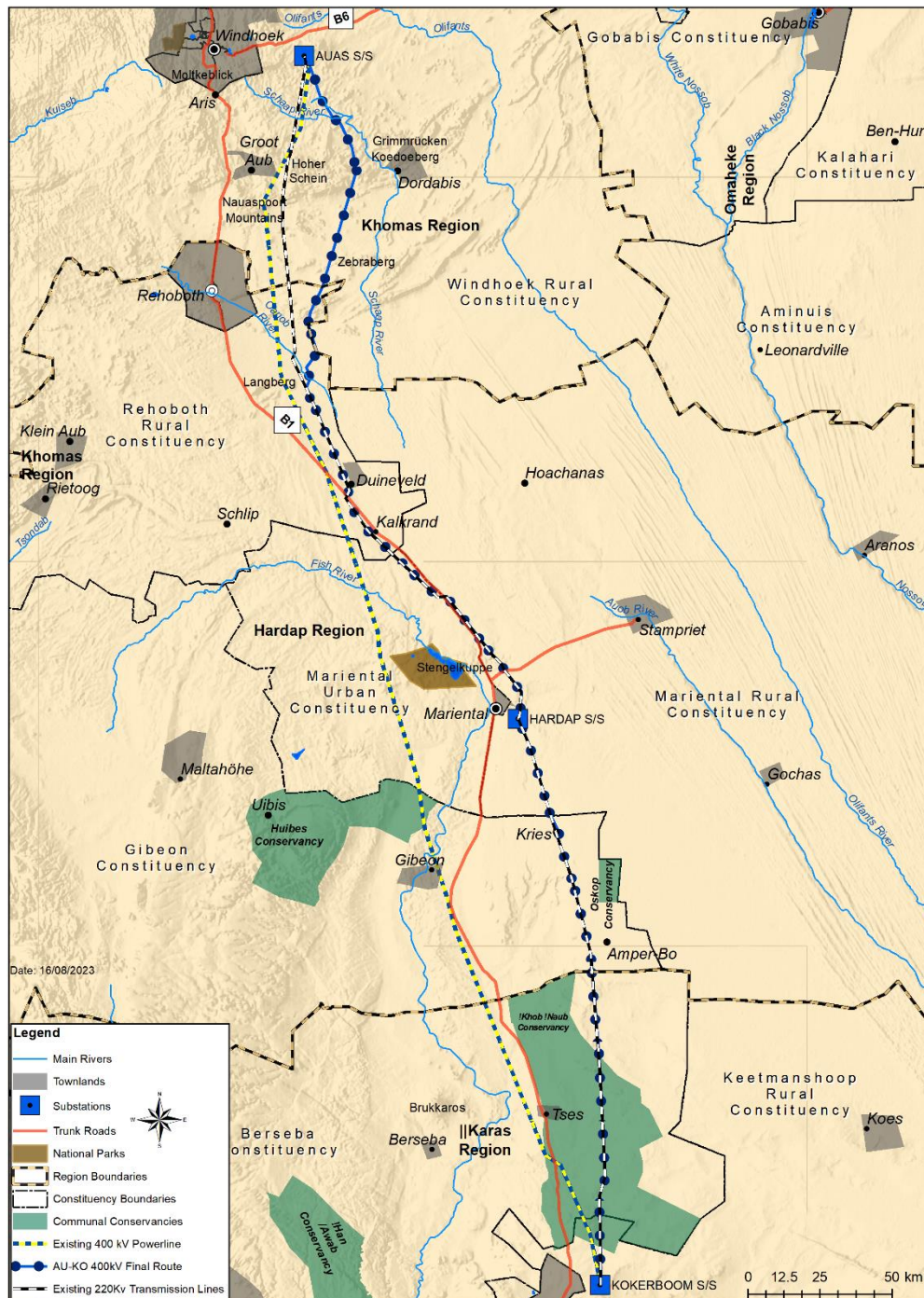


Figure 1: Locality of the proposed Awas-Kokerboom 400kV Transmission line

An initial Environmental Impact Assessment was conducted for the project to satisfy the requirements of the Environmental Management Act (2007) and its Regulations (2012), i.e. before involvement of the World Bank. An Environmental Clearance Certificate was received for the project in January 2021 in terms of the mentioned Namibian legislation. The updated ESIA for the project was prepared in 2023, and is currently under review by the World Bank to be finalized by project appraisal in January 2024.

NamPower is currently seeking funding from the World Bank for the construction of the transmission line along with a number of associated works, which will include the following:

- The new Avas-Kokerboom 400kV Transmission Line, with associated infrastructure at both substations such as switchgear and reactors
- A Battery Energy Storage System (BESS) to be installed at Lithops Substation, that will enable NamPower to store energy generated by, amongst other, renewable sources such as solar or wind energy to allow utilisation of such energy when these resources are not available, such as after sunset. See **Appendix D** with further project details on the BESS.

The World Bank requires of its Borrowers to fulfil the requirements of its Environmental and Social Framework (ESF). The Framework sets out the environmental and social safeguards to be implemented during all phases of a project life-cycle.

Enviro Dynamics has been appointed to update the Environmental Impact Assessment process (2020) to fulfil the above requirements of the World Bank.

Stakeholder Engagement has been carried out for the Environmental Impact Assessment conducted to Namibian and World Bank standards. This document sets out the work to be conducted for the ESIA, according to the Stakeholder Engagement Plan also presented here, as a final round of consultation following the initial consultation, to fulfil the requirements of the ESF, as set out in Environmental and Social Standard 10: Stakeholder Engagement and Information Disclosure.

2 THE PROJECT SCOPE

2.1 PROJECT DESCRIPTION – 400KV TRANSMISSION LINE

2.1.1 Transmission line route

The general direction of the 500km route is from Avas substation near Dordabis to Kokerboom substation near Keetmanshoop. The overall aim is to keep the route short over this distance, yet avoid major topographical limitations. Furthermore, the aim is to place the route alongside existing infrastructure to avoid the breaking up

of productive land, habitat and limit visual intrusion, as well as any physical resettlement of people and land acquisition. Historic work on the route finalisation has focussed on these aims and to accommodate stakeholder concerns where possible.

2.1.2 Structural and physical requirements of the line

The entire length of the proposed transmission line is estimated to be approximately 500 km.

There will be no land acquisition conducted, and all of the impacts on land are limited to servitude. The servitude will be 80 m wide for the entire line an estimated 12 m width will be cleared of vegetation and obstacles to create a service road, to provide access (during construction and maintenance) to the line throughout its lifespan of 30 years. Owing to its footprint, the area about the centre of each V-structure to be cleared of vegetation will cover an area of approximately 70 m X 50 m.

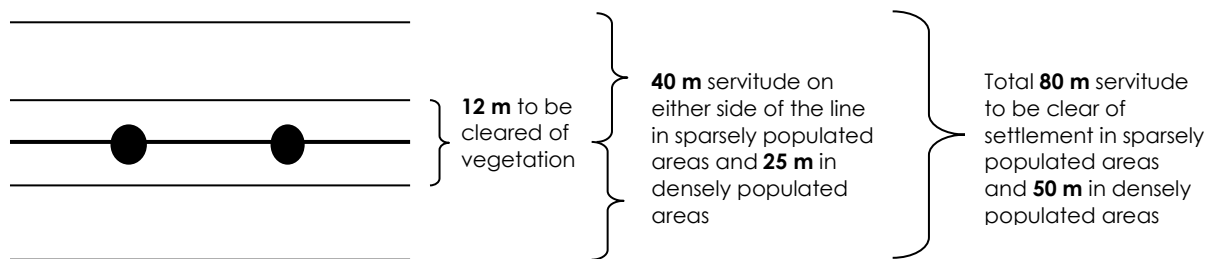


Figure 2: Servitude details for the proposed transmission line

Since the line will run parallel to an existing power line to the south, the servitude width there including the existing line will be 110m in total, consisting of a minimum distance of 45m between the two lines, and a 40m servitude outside the centre line of the 400kV line, and 25m outside the centre line of the existing 220kV line.

For safety and technical reasons, no permanent structures other than the towers are allowed within the servitude. Grazing and cultivation of fields with associated farming activities may be accommodated within this area as there is still plenty of land surrounding the actual footprint, except for the 12 m strip, which is needed during construction. No serious impact on livelihoods or economic displacement is expected as a result of works (with the exception of low to minimal impacts associated with processing servitudes).

2.1.3 Regeneration stations

There are no new substations required for this proposed power line, although changes will be made to the existing Auas and Kokerboom substations to accommodate it.

Four new Fibre Regeneration stations will need to be constructed. These stations are normally contained within the footprint of one of the towers, and are fully fenced off with a gate. Therefore, no land acquisition, servitude, or any other ESS5 impacts are anticipated.

2.1.4 **Project Cost and Timeline**

Cost estimates are approximately N\$ 2.2 million per km for the V-tower system. The total cost is therefore expected to be at least N\$ 990 million.

The construction period will be approximately 36 months or two to four years, depending on the construction programme favoured.

2.1.5 **CONSTRUCTION MATERIALS AND PROCESS**

The project will require the following approximate volumes of materials per km of transmission line:

- Approximately 12 m³ water from boreholes for concrete.
- Approximately 50 m³ sand and stone for concrete, sourced locally.
- Approximately 12 tons galvanised steel, sourced internationally.
- Conductor, Optical fibre, Insulators and associated hardware will be sourced internationally.

The project will be sourced from two base camps as well as satellite camps for every 40 km of line. The construction process will use three separate teams that will be responsible for:

- Clearing the line, digging and casting of foundations;
- Constructing towers (specially trained team); and
- Stringing and clamping the cabling (specially trained team).

2.1.6 **Employment Creation**

About 100 people will be employed during construction of a section of line, of which approximately 10 people will be of management and supervisory capacity. The remainder will be artisan and skilled labour, with a smaller component of unskilled labour.

The maintenance of the new transmission line is likely to be done by existing NamPower staff, therefore, no employment creation is expected during operation. If an agreement can be reached between NamPower and the local authorities, the maintenance of the cleared portion of the servitude could serve as an employment opportunity in the future when works are completed.

2.2 BATTERY ENERGY STORAGE SYSTEM (BESS)

A Battery Energy Storage System (BESS) is comprised of three major components: the battery which is the energy container; the power conversion system/inverter, which interfaces the DC battery system to the AC power system; and the power plant controller which governs, monitors, and executes the intended functions of the energy storage application.

The NamPower grid shows strong feasibility during normal operation. The final decision to install the BESS at Lithops substation is taken in terms of arbitrage. This is a suitable location for the BESS installation:

- This location is close to high-loading mine area and the BESS could reduce the inrush current when the heavy machinery is connected.
- Power fluctuations from upcoming PV projects can be compensated directly at the source.
- BESS will allow PV penetration to be increased beyond the current committed expansion plans in the region. The demand here for captive PV power plants is especially interesting due to the large industrial loads.

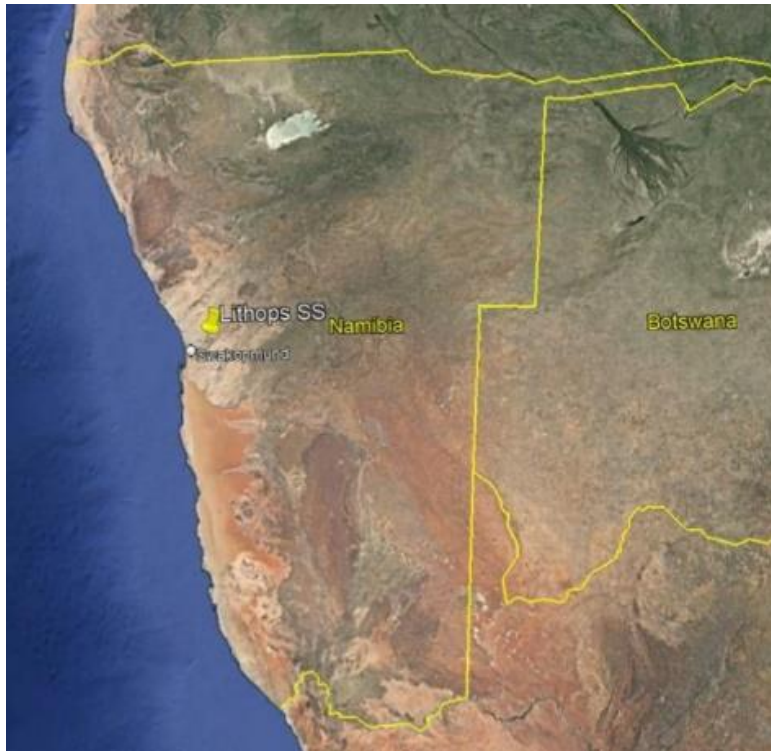


Figure 3: Lithops Substation Location: proposed site for BESS

3 PREVIOUS STAKEHOLDER ENGAGEMENT ACTIVITIES: 400kV TRANSMISSION LINE

3.1 WORK DONE PRIOR TO 2023 ESIA UPDATE

3.1.1 Scoping study

During the Scoping study of the EIA process, a thorough stakeholder engagement exercise was undertaken during May and June 2016. Although this was prior to anticipation of World Bank financing, the demographical landscape of stakeholder has not been changed since then.

At the time of the initial round of consultation, the Consultant used all relevant means to ensure engagement, access to the information and a reasonable chance to comment.

Public meetings were held at the following places:

- Keetmanshoop Show Hall, Keetmanhoop
- Tses Community Hall, Tses
- Gibeon Community Hall, Gibeon
- Mariental Hotel, Mariental
- Kalkrand Community Hall, Kalkrand
- Hermann van Wyk Memorial Hall, Rehoboth
- Dordabis Farmer's Association Hall, Dordabis and
- NamPower Convention Centre, Windhoek.

Forty six (46) Interested and affected parties commented at this time, indicating that engagement was effective and bring benefits to communities. Comment received during the Scoping phase fell into the following categories:

- Confirmation of the need for the proposed project due to the unreliable electricity supply in the area and the need to strengthen the counties' overall transmission line network, and the encouragement of NamPower to construct the proposed project
- Support for the proposed EMP for the construction and operational phases in order to mitigate potential detrimental impacts
- Concerns over the impacts on avifauna, change of sense of place, long-term disruption to livelihoods and life (including homesteads and farm infrastructure) as well as short-term disruption to farm management.

Suggestions were made to realign the powerline away from established infrastructure to minimise/ avoid impacts to livelihoods. Notably, these suggestions are incorporated in the latest route proposed to the World Bank, and will avoid significant land impacts and require only servitude.

- Various specialist studies were undertaken to address the concerns as presented during this engagement process.

3.1.2 Engagement during Environmental Impact Report 2019-2021

During the submission of the 2019-2021 Environmental Impact Reports, stakeholder engagement was again undertaken, since a number of years had lapsed since the scoping study was commissioned.

The Draft Assessment Report was circulated for review to the stakeholders, notably the effected farm owners on 11 November 2019. After this process it became apparent that some farm owners still objected to the position of the line on their farms. Follow up engagements therefore took place with these specific farm owners. All concerns were addressed by adjusting the route to avoid some of the sensitivities pointed out by the farm owners. In one instance, this was not possible due to cost implications, new impacts to other farm owners when moving the line, and the need to keep the line parallel to the existing one to avoid bird collisions.

The details of this process are available in the presentation (Appendix A), and the focus areas consulted is shown in **Figure 4**.

4 2023 STAKEHOLDER ENGAGEMENT PLAN

A thorough identification of stakeholder groups was done during the 2016, then again in 2019-2021, Scoping Process. This was renewed again in 2023 in the context of the World Bank involvement and its ESS10 requirements.

The aim of the current process is to focus on the affected authorities, directly affected parties (i.e. farms which are affected by the transmission line), as well as applicable NGOs, notably those concerned with biodiversity and birds, as well as representatives of Indigenous Peoples/vulnerable and disadvantaged groups.

4.1 AUTHORITIES

The proposed transmission line traverses three (3) regions (namely Khomas, Hardap and //Karas Regions). **Table 1** below shows the Constituencies within each region that are affected.

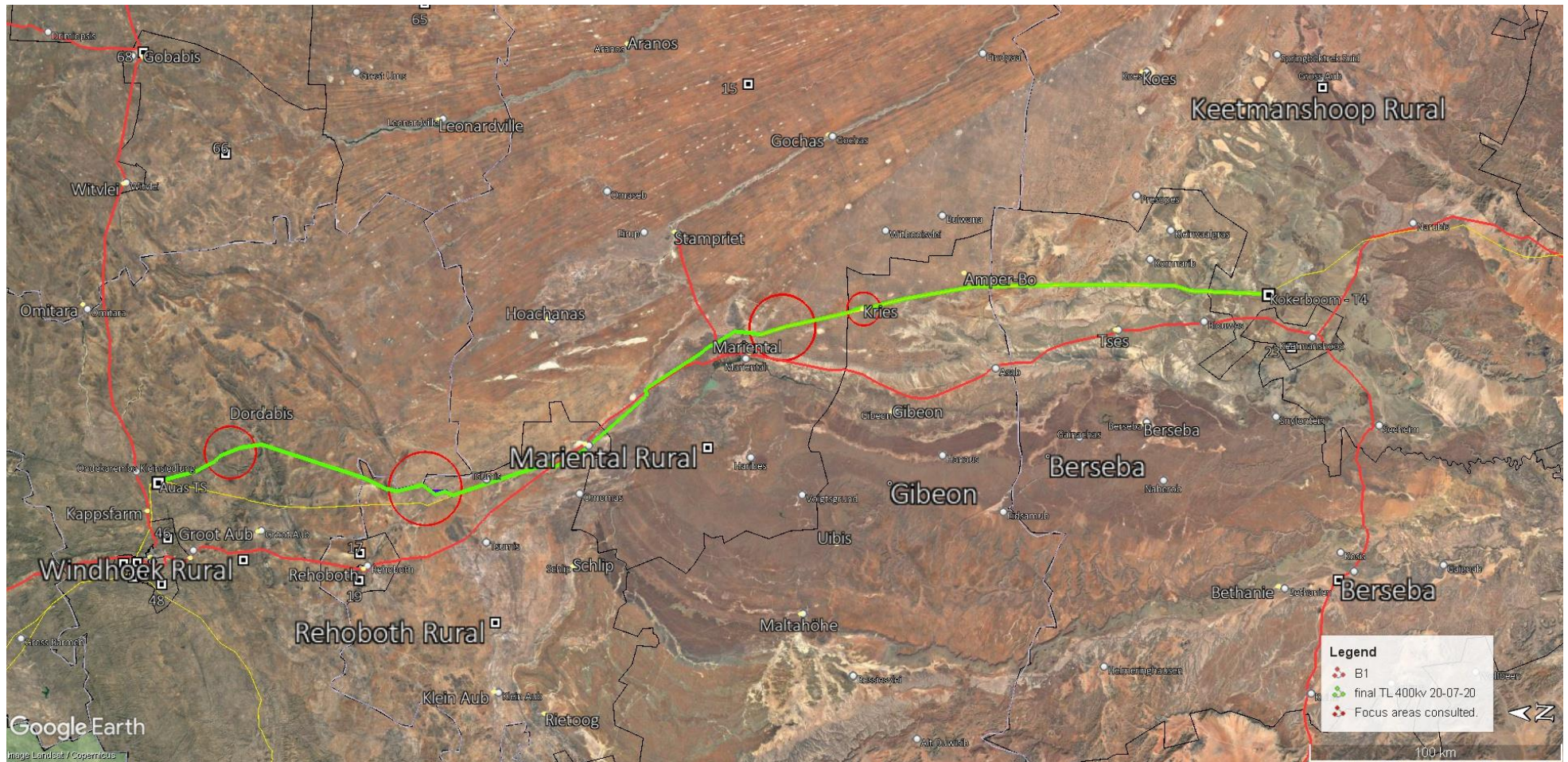


Figure 4: Proposed Transmission Line Route showing affected Constituencies, Villages and Towns passed, and focus areas consulted.

4.2 PROJECT AFFECTED PARTIES

4.2.1 Land owners and occupants – 400kV line

The proposed transmission line traverses 88 farms¹, the distribution and ownership status² of these farms is presented in **Table 1**, which also illustrates the freehold and communal areas in the three project-affected regions.

Table 1: Distribution and tenure status of affected farms.

Region	Constituency	Total Farms	Private		State-Owned	Unknown
			Individuals	Companies		
Khomas	Windhoek Rural	28	22	6	-	-
Hardap	Mariental Rural	19	10	5	3	1
	Mariental Urban	1	1	-	-	-
	Rehoboth Rural	18	13	2	3	-
	Gibeon	10	-	-	10	-
//Karas	Berseba	6	-	1	5	-
	Keetmanshoop Rural	7	2	-	5	-
TOTAL		89	50	14	24	1

Source: Surveyor General, May 2016 and personal interviews, October 2016, cited in Desai, 2016.

The farms located in Windhoek Rural are 100% privately owned by individuals or companies. In Mariental Rural, Mariental Urban and Rehoboth Constituencies, ~82% of the farms are privately owned and 16% are state-owned.

The Rehoboth 'Baster Gebiet' is largely located in Rehoboth Constituency and crosses the boundary into the southern parts of Windhoek Rural Constituency.

¹ This information was collected from the Deeds Office. The accuracy of the information is variable. (Desai, 2016)

² The tenureship status is as captured at the Deeds Office in 2009. More detailed work was done in 2020 to verify the ownership of these farms and the updated information was used during engagement at that time. Ownership had changed in some cases, but not ownership status.

'Baster Gebiet' refers to land located in the vicinity of Rehoboth, Duineveld and Kalkrand towns. The Rehoboth Basters, amongst other 'Baster' groups, migrated north of the Orange River, as they were not permitted to own land in the Cape. They searched for new homes and secure pastures. With Namibian independence, their communal 'Gebiet' ceased to exist; the land was divided up into privately owned freehold farms (registered to individual Basters);³. These farms are often divided between family members following the death of the registered owners; this occurs informally and is not reflected at the Deeds Office. As such, in practice, these farms may be smaller than those recorded at the Deeds Office.

South of Kries, almost 100% of the farms are state-owned in Gibeon and Berseba constituencies. Five of the 7 affected farms in Keetmanshoop Rural (71%) are state-owned and the remaining 2 are private. In Gibeon and Berseba, some of the state-owned land is leased on a contract basis as 'resettlement farms'; however, the majority of state land is communal and under the jurisdiction of the Traditional Authorities. The Ministry of Land Reform has over-arching responsibility for all state-owned land.

Straddling the boundary of the Hardap and //Karas regions is the communal land (this includes the 'pre-independence private farms'); see **Table 1**. The proposed transmission line will run through this area, ending approximately 23km north-east of Keetmanshoop. The communal area is referred to as Namaland and is occupied and used by the Nama people. Kries, Gibeon, Amper-Bo, and Tses are some of the established settlements that accommodate many of the Nama households, education and healthcare facilities. There are structures (including kraals, water points, small houses) scattered throughout the communal area, however these are sparsely distributed.

All these villages and structures are avoided by the power line with the route planning work done to date.

4.2.2 Other interested parties

As mentioned, NGO's and individuals specifically concerned with birds, biodiversity and vegetation were including in the Stakeholder Engagement Plan and targeted.

³ Rehoboth, Namibia – Past & Present, 2012.

4.2.3 Vulnerable groups

Generally, vulnerable groups⁴ are present in the study area. These groups were all identified as part of the original stakeholder engagement exercise, as described above. Because of distinct languages, rural nature, or relative illiteracy, such groups are sometimes excluded from various engagements, and therefore, the project preparation specifically focused on ensuring that such groups are well informed of project decision making and are aware of the proposed project activities. Thus, all directly affected owners and occupants as well as their leaders were identified. The communal land is mostly where vulnerable groups reside. None of their assets or livelihoods are affected by the project. Grazing of livestock is still possible under the power lines. However, during the current engagement process, care was taken to involve the leadership of these groups, to ensure their concerns could be heard, if any.

The vulnerable groups in the area also include women, and those without jobs. The English language may also be a barrier, therefore the stakeholder engagement process used necessary translation and applicable language where necessary. Another barrier was access to written documentation for the communities. Therefore physical meetings were held where needed.

The Nama people

The Nama group, residing in the lower two thirds of the transmission corridor, is considered to be a specific Indigenous Group, recognised as such in Namibia. The Nama people reside mostly in villages and towns along the route. The people are livestock farmers, but do increasingly work in towns and villages in the area. The

⁴ World Bank Definition of vulnerable groups as described in ESS7 "8 . In this ESS, the term "Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities" (or as they may be referred to in the national context using an alternative terminology) is used in a generic sense to refer exclusively to a distinct social and cultural group possessing the following characteristics in varying degrees: (a) Self-identification as members of a distinct indigenous social and cultural group and recognition of this identity by others; and (b) Collective attachment⁶ to geographically distinct habitats, ancestral territories, or areas of seasonal use or occupation, as well as to the natural resources in these areas; and (c) Customary cultural, economic, social, or political institutions that are distinct or separate from those of the mainstream society or culture; and (d) A distinct language or dialect, often different from the official language or languages of the country or region in which they reside . 9 . This ESS also applies to communities or groups of Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities who, during the lifetime of members of the community or group, have lost collective attachment to distinct habitats or ancestral territories in the project area, because of forced severance, conflict, government resettlement programs, dispossession of their land, natural disasters, or incorporation of such territories into an urban area . 7 This ESS also applies 5 The scope and scale of consultation, as well as subsequent project planning and documentation processes, will be proportionate to the scope and scale of potential project risks and impacts as they may affect Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities . See paragraph 11 . 6 "Collective attachment" means that for generations there has been a physical presence in and economic ties to land and territories traditionally owned, or customarily used or occupied, by the group concerned, including areas that hold special significance for it, such as sacred sites . 7 Care must be taken in application of this ESS in urban areas . Generally, it does not apply to individuals or small groups migrating to urban areas in search of economic opportunity . It may apply, however, where Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities have established distinct communities in or near urban areas but still possess the characteristics stated in paragraph 8 . to forest dwellers, hunter-gatherers, pastoralists or other nomadic groups, subject to satisfaction of the criteria in paragraph 8"

!Khoi !Naub Conservancy (**Figure 1**), is a protected area occupied by Nama people. The area contains limited wildlife, for which hunting permits are issued annually by the Ministry of Environment, Forestry and Tourism and has zones allocated according to the management plan of the conservancy.

Representatives of the Nama people, as well as of the conservancy, were targeted as important stakeholders, and have attended consultations.

The Kriess Village, occupied by Nama people was also targeted during this engagement, since it is a settlement adjacent to the proposed route, but not directly impacted by its footprint.

4.2.4 Stakeholders of BESS

The BESS team identified the following specific stakeholders on the BESS at the Lithops substation:

- NamPower
- Ministry of Mines and Energy (MME) as competent authority
- Ministry of Environment, Forestry and Tourism, (MET) as regulator
- Ministry of Agriculture, Water and Land Reform (MAWF), Ministry of Works and Transport (MWT), Ministry of Labour and Social Welfare (MLRS), Ministry of Health and Social Services (MHSS), Ministry of Industrialization, Trade and SME Development as other involved ministries, or ministries to keep informed.
- National Heritage Council (NHC)
- Erongo Regional Council with jurisdiction in the region
- City of Arandis and Swakopmund as off-takers
- Adjacent Landowners, which Sahara Mine Dimension Stone, Khan Mine, Stone Africa Dimension Stone, Savanah Marble, Rössing Mine.

4.3 SUMMARY OF STAKEHOLDER NEEDS

Stakeholder group	Key characteristics	Language needs	Preferred notification means (e-mail, phone, radio, letter)	Specific needs
Regional and national stakeholders	Time constraints Fluent in English Literate Distanced from the project	English	E-mail	Provide ample time for comment
Community leaders	Rural nature, sometimes inability to read, comprehend invitations, project details	English, Afrikaans	Mobile phone no access to e-mails. Councillor may share information	Meetings advance notice.

Stakeholder group	Key characteristics	Language needs	Preferred notification means (e-mail, phone, radio, letter)	Specific needs
				Explain in simple terms
Land owners	Rural – commercial and communal Time constraints Distance from meetings Rural ability to understand The commercial farm owners mostly have access to e-mail, and are literate in English. This includes the BESS adjacent landowners.	English, Afrikaans	E-mail for commercial owners, BESS. rural – notified through leadership and e-mail where applicable, watssapp	Advance notice Focal meetings where there are objections

4.4 STAKEHOLDER ENGAGEMENT METHODS

All stakeholders were notified of the updated ESIA process through e-mail. All the commercial farm owners and BESS stakeholders have access via e-mail, as well as WhatsApp as this has proven to be the most optimal method to reach stakeholders. Specific stakeholders such as councillors and other leaders were directly contacted and requested to arrange the meetings for the communal area specifically Kriess where it was felt that this community was perhaps excluded from Consultation before during 2016 scoping. During this round of consultations, the consultant aimed to engage the leadership of communal areas.

All engagements were recorded and the issues and responses identified.

The ESIA and ESMP Reports will be circulated for comment to these stakeholders again before project's appraisal in January 2024.

5 2023 STAKEHOLDER ENGAGEMENT REPORT

From experience it was found that the farm owners from Windhoek to Mariental have e-mail access and that, through past interactions, all their concerns were addressed and the line moved to suit their needs.

For this reason, one meeting was held at Gibeon to target the leadership of the Kriess community, the general Gibeon Constituency, and leadership of the !Khub !Naub Conservancy.

Another meeting was held in Windhoek for any commercial farm owners who still needed an opportunity to comment.

The minutes of these meetings are attached as **Appendix A**.

A Background Information Document (**Appendix B**) was circulated to all on the stakeholder database in order to solicit comments, either telephonic, or by way of a focal meeting. A Background Information Document (**Appendix D**) was also sent to the stakeholders of the BESS project, soliciting their concerns.

There were technical questions asked at the meeting and some needed confirmation on, for instance, how far the power line would be from their residences. After an explanation on the distance of servitude and necessary processes, there was clarity and no further comments were received. At Gibeon there was a request to employ the local people as unemployment was reported as being very high, which is indicative of broader economic situation in the country. It was explained candidly and to manage expectations of stakeholders that the project is not a significant employment creator at this point.

The Avifauna specialist who was involved in conducting the original Avifauna Impact Assessment, requested an edit within the main ESIA, to reflect the fact that the staggering of the pylons is important for mitigation purposes.

To date no comments have been received on the BESS component of the proposed project.

The e-mail communication, for both the 400kV transmission line project and the BESS is presented in **Appendix C**.

6 STAKEHOLDER ENGAGEMENT PLAN DURING CONSTRUCTION AND OPERATION

The following schedule and roadmap is proposed for engagement during construction and shall be included in the ESMP.

Project stage	Topic of consultation	Method used	Timetable Location and dates	Target stakeholders	Responsibilities
Pre-construction	Recruitment	Meeting	At Regional council Prior to construction	Community leaders And Councilors meeting	Contractor

Project stage	Topic of consultation	Method used	Timetable Location and dates	Target stakeholders	Responsibilities
Pre-construction	Construction activities and what to expect Health and safety Grievance	E-mail NamPower website	Electronic prior to construction, with updates every three months or as may be appropriate	Community leaders Landowners	Community Liaison Officer (CLO) Engineer
As needed	Grievance redress	Individual, meeting,	Needs based	Leader and affected individual	Community Liaison Officer (CLO) Engineer
Monthly	Progress report Environmental and Social performance	Meeting	As determined by the community leaders where construction is in progress	Leaders Stakeholder list	Community Liaison Officer (CLO) Engineer

7 GRIEVANCE REDRESS MECHANISM

By adopting this SEP, NamPower is committed to fostering a constructive project work environment in which the views and rights of both NamPower and its internal and external stakeholders are respected. Feedback received from stakeholders will contribute to the development and status of the stakeholder engagement matrix. The project has therefore, instituted this grievance procedure aimed at:

- Providing all stakeholders (internal and external) with the opportunity to raise any individual or group grievances; and
- Ensuring a consistent and fair approach in addressing any stakeholder dissatisfaction/grievance that has been raised within the project

Principles:

- The project is committed to the fair treatment of all its stakeholders who lodge a grievance and stakeholders are therefore encouraged to raise grievance without prejudice to the contracts/interest/roles, provided that the grievance is not false or of a malicious nature.
- Any stakeholder has the right to submit all its grievances to the Project Manager for a solution.
- Provided that the grievance issue is within the Project Manager's control, the Project Manager shall attempt expedite the resolution of the matter diligently.
- Recourse to the mechanism will not prevent access to judicial or administrative remedies.
- Complainants may request anonymity and confidentiality, and procedures should respect such requests, in line with Namibia's laws as well as WB's ESF.

The Project Grievance mechanism is attached as Appendix E. Its implementation is required according to the ESMP of both the 400kV transmission line and the BESS.

There are various avenues that will be employed in the stakeholder engagement process throughout project cycle by NamPower going forward:

a. Community Forums: To facilitate effective consultation with the communities during implementation of the project, establishes community forums through local community established leadership to disseminate project information to community members.

b) Local Government: engaging local government representatives as a channel to disseminate information on the project.

c) Information Boards: Notice boards are effective mechanisms to inform the communities and wider audiences about the project. These can be installed on specific areas of impact (communities).

d) Media: Newspapers commonly read in the project area will be used to notify the general public.

e) Using Whatsapp, Phone, Email to keep regular contact with key stakeholders, as well as receive necessary feedback from them.

8 STAKEHOLDER ENGAGEMENT DURING OPERATION AND MAINTENANCE

The following is applicable to both the BESS and 400kV transmission line projects.

8.1 REPORTING

The MEFT requires bi-annual reporting and as part of this reporting, the environmental and social performance is due. The reporting should include grievances redressed for the period as well as accidents and incidents in the community and how they were resolved. It is recommended that all those on the stakeholder list also receive access to this report via the internet and the local leadership as appropriate. This requirement will be included in the ESMP.

8.2 FUTURE PROJECT MAINTENANCE WORKS AND EXTENSIONS

Any new construction schedules and significant maintenance works should be communicated to the applicable community/stakeholders as described above, and they should be included as stakeholders to the project.

Access to farms and the conservancy should be communicated beforehand to the land owner and occupants, in line with Namibia's laws, as well as principles of the WB's ESS10.

APPENDIX A MINUTES



AUAS-KOKERBOOM 400kV TRANSMISSION LINE

Community Consultation Meeting

5 July 2023

Meeting date: 5 July 2023

Venue: Gibeon Constituency Office

Conveners: Norman van Zyl, Enviro Dynamics
Martin Van Der Merwe, NamPower

Attendants: Appendix A, including representatives from the Conservancy, Kriess village, Gibeon Constituency, Including Nama leaders.

Presentation: Appendix B

1 INTRODUCTION AND PURPOSE

Mr. Norman van Zyl introduced the conveners and the purpose of the meeting, namely to bring progress with the project, get final input and explain the way forward. The meeting was conducted in Afrikaans as per the overwhelming wish of the participants. For further information refer to Appendix B. Detailed information on each project components were delivered to the participants to make them fully aware of the activities.

2 THE PROJECT

Mr van Zyl further used the presentation (Appendix B), to explain the history of the EIA and its findings as well as the proposed project route with its details. He emphasised the objective of NamPower to fund the project through World Bank. The Auas-Kokerboom 400kV transmission line, a Battery Energy Storage System (BESS) and further technical studies for NamPower will be funded by World Bank. He also emphasized that should participants have any suggestions at any point during actual consultations, and any point thereafter, they should feel free to reach out to him as well as NamPower to express any wishes or concerns that they may have.

3 QUESTIONS AND COMMENTS

Mr Van Zyl explained the limitations under the route, namely that no structures could be erected, but that grazing could continue there once the construction phase was

completed. During construction phase, grazing can continue elsewhere as there is adequate land beyond the footprint of the project activities along the route. He enquired from the audience whether there would be any impacts on the livelihoods of the people. Participating did not express any particular concerns on livelihoods, or land impacts, or construction. Overall, they welcome the longer term benefits that the project will bring to the region and communities. The following are some of the key responses, questions and comments were received from the audience:

(Note: English responses, below Afrikaans language responses)

Comments/questions	Response
<p>Van Kries af is daar plase naby die 220kV lyn. Sal die nuwe hulle nie affekteer nie?</p> <p>Around Kries there are farms near the 220kV line. Will they be affected by the new line?</p>	<p>Nee. Dit is bevestig dat hulle aan die ander kant van die lyn lê.</p> <p>No. It is confirmed that they lie on the other side of the old line.</p>
<p>Wat van die vee poste?</p> <p>Wat about stock posts?</p>	<p>Dit het geen effek op vee poste se gebruik nie. Beeste kan nie in die nuwe toring ontwerp vassit nie.</p> <p>It will have no effect on the use of stock posts. The new tower design will also not allow cattle to get stuck.</p>
<p>Sal die ou 220kV lyn tot niet gemaak word?</p> <p>Will the 220kV line be shut down?</p>	<p>Nee.</p> <p>No.</p>
<p>Sal nuwe plase van die 400kV lyn krag kan kry?</p> <p>Will new farmhouses be connected to the 400kV line?</p>	<p>Nee, die nuwe 400kV lyn is te groot. Dit is te duur om plaaslike huise te koppel.</p> <p>No, the new 400kV power line is too big. It would be too expensive to connect farmhouses.</p>
<p>Sal Kries gekeer word van onder die lyn uitbrei?</p> <p>Will Kries be kept from expanding underneath the power line?</p>	<p>Niks permanent moet onder die lyn gebou word nie.</p> <p>Yes, nothing permanent should be built underneath the power line.</p>

Comments/questions	Response
<p>Sal die nuwe 400kV lyn die krag pryse verlaag?</p> <p>Will the new 400kV line lower power costs?</p>	<p>Die krag lyn sal nie noodwendig die prys verlaag nie, maar dit sal krag voorsiening stabiliseer en nuwe bronne akkomodeer.</p> <p>The new power line will not have a direct impact on prices, but will stabilise power provision and will accommodate new sources.</p>
<p>Sal die plaaslike mense konstruksie werk kry?</p> <p>Will the locals get construction work?</p>	<p>Die ooreenkoms met die kontrakteur sal voorsiening maak vir die gebruik van plaaslike werkers waar moontlik.</p> <p>The agreement with the contractor will make provision for the use of local workers where possible, although employment opportunities are limited.</p>

APPENDIX A: ATTENDANCE LIST

Gibeon Constituency Office		
5 July 2023 / 400kV line meeting.		
Name	Office	Contact
J.F.A. BERENA	BONDERSWARTS	08/2886157
Josephine SKETER	Bondelswats	0814422437
RUDY BASSON	KRIGSS. SET. OFF	0812336911
Silia Bloodstam	EDUCATION	0813091490
STANLEY KATZAU	GIBEON COUNCIL	0816490166
GERTSON HOKOBER	"Guguru - Ames" ^{SOUT PUT}	0812426519
Juleata J. Kisting	SIC	0816210408
CHRIS Kisting.	MANLR	0813352261
Moritz Apellus	ROSENHOF	0813196027
Ludwig WINDSTAAN	South Bok - Area	0814411597
Bonifatius Witbooi	BONDERSWARTS	0817118234
Amon D. Steuwe	Gibeon	0813289256
JEREMIAS SWARTBOOI	HEMAT	0817584130
ANNA ELIAS	Farm Falkenhof	0814028686
JOHANNES J. EISER	FALKENHOF	0813684961
Timo Isaackes	GRUNDPORING	0812617479
Derrin Demminde	Cuben	0813890821
IDA KARICUS	Ciibeon	0812606907
Willem Hance	Ciibeon	0812027380

APPENDIX B: PRESENTATION

Environmental Impact Assessment for the proposed Auas - Kokerboom 400 kV Transmission Line

Existing EIA update to World Bank Standards

Stakeholder update and engagement



Agenda

- Introduction of the project.
- Purpose of the engagement.
- History and findings of the EIA
- Description of the project
- Your comments



Introduction

- Norman van Zyl / Martin van der Merwe.
- 400kV transmission line:
 - approximately parallel to existing 200kV transmission line
 - from the Kokerboom substation, near Keetmanshoop,
 - to the Auas Substation, near Dordabis.
- Original EIA - 2016, Update – 2021.
- Now require an update for Word Bank funding.



Purpose of the engagement

- World Bank funding for:
 - The new Auas-Kokerboom 400kV Transmission Line with substation infrastructure.
 - Battery Energy Storage System (BESS) at Auas Substation for renewable sources energy.
 - Other energy focussed studies in support of NamPower.
- World Bank require Environmental and Social Framework.
 - Stakeholder re-engagement to fulfil requirement.
 - Kries community.



EIA history and findings

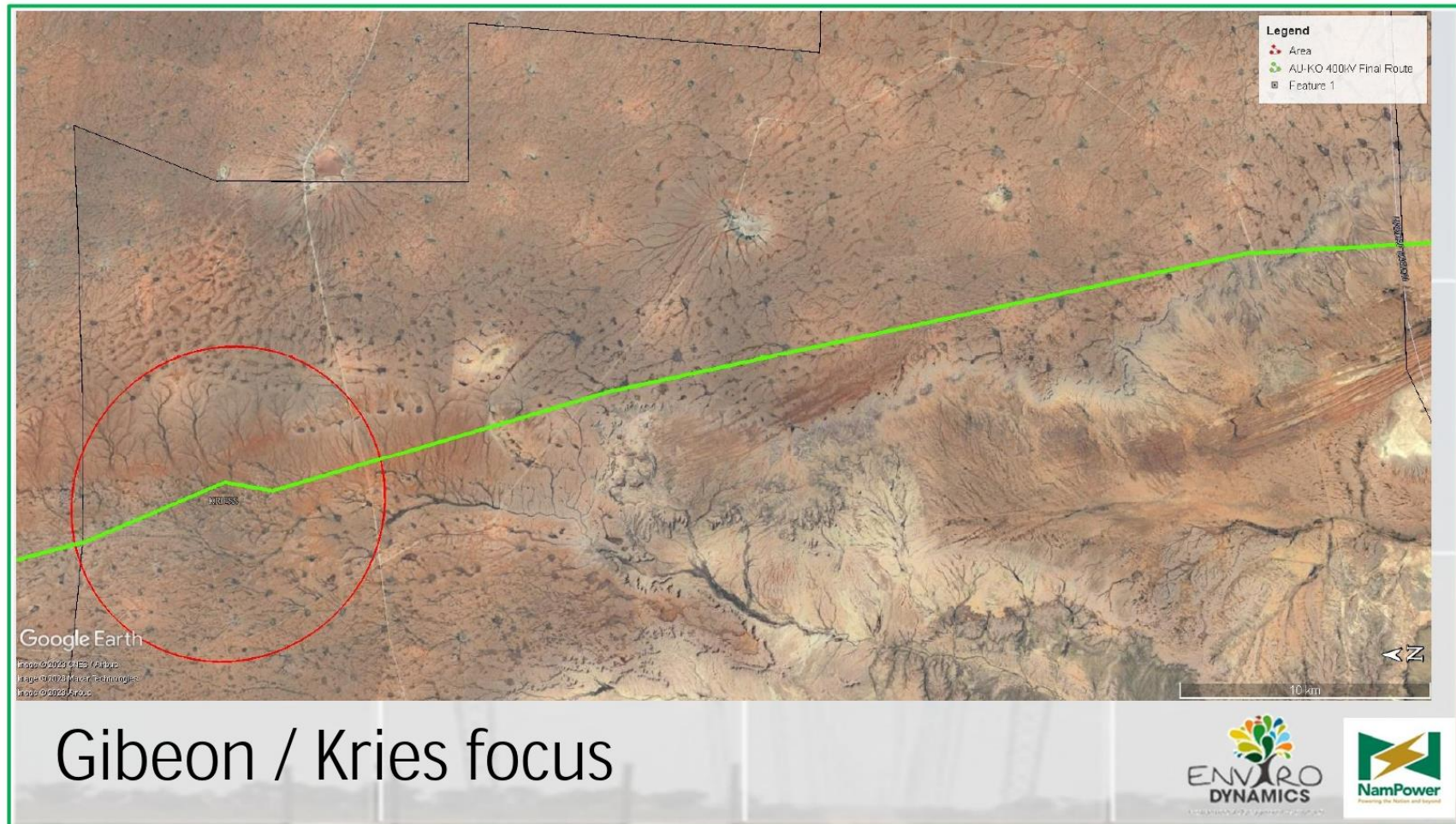
- Engaged all stakeholders in 2016 as well as 2020.
 - Included two route alternative considerations.
 - Extensive specialist input into birds, vegetation, land use.
 - Led to various final route adjustments.
 - Finalised and received GRN clearance in 2021.
- Key findings:
 - Risk to vegetation limited to protected trees.
 - Risk to birds complex. Will require further monitoring.
 - Risk to land use - route adjustments minimized.



Project description – 400kV Transmission Line

- 400kV transmission line:
 - approximately parallel to existing 200kV transmission line
 - from the Kokerboom substation, near Keetmanshoop,
 - to the Auas Substation, near Dordabis.
- Let's look at some maps and details.









Your input

- Update of existing engagements.
- Focus on communal area, - Kries community.
- Confirmation of consultation.



Way forward

- Questions and comments may be sent to:
 - Send your inputs to the e-mail address provided below;
 - Attend one of the pre-arranged meetings communicated;
 - Contact us directly

- Contact details:

Stephanie van Zyl

E-mail: stephanie@envirod.com

Tel: +264 833305891



AUAS-KOKERBOOM 400kV TRANSMISSION LINE

Public Consultation Meeting

12 July 2023

Meeting date: 12 July 2023

Venue: NamPower Convention Centre

Conveners: Norman van Zyl, Enviro Dynamics
Martin van der Merwe, NamPower

Attendants: Appendix A

Presentation: Appendix B

1 INTRODUCTION AND PURPOSE

Mr. Norman van Zyl introduced the conveners and the purpose of the meeting. The meeting was conducted in English and Afrikaans. For further information please refer to Appendix B.

2 THE PROJECT

Mr van Zyl used the presentation (Appendix B), to explain the history of the EIA and its findings as well as the proposed project route with its details. He emphasised the objective of NamPower to fund the project through the World Bank. The Auas-Kokerboom 400kV transmission line, a Battery Energy Storage System (BESS) at the Auas substation and further technical studies for NamPower will be funded by the World Bank.

3 QUESTIONS AND COMMENTS

Mr Van Zyl explained the limitations under the route, namely that no structures could be erected, but that grazing could continue there once the construction phase was completed. During construction phase, grazing can continue elsewhere as there is adequate land beyond the footprint of the project activities along the route. He enquired from the audience whether there would be any impacts on the livelihoods of the people. Participating did not express any particular concerns on livelihoods, or land impacts, or construction. Overall, they welcome the longer term benefits that the project will bring to the region and communities. The following are some of the key responses, questions and comments were received from the audience:

Comments/questions	Response
Is the line route final? Can there be adjustments to the new 400kV line?	NamPower explained the long history of considering the final route of the 400kV line, including various iterations with the stakeholders in order to accommodate their needs.
What is the distance between the 220kV and 400kV line at Kries?	The 220kV line runs close to the western edge of the Kries village which leaves no space for the 400kV line. Therefore, the 400kV line will deviate to the east of the village with at least a 250m buffer from the village.
Sal die ou 200kV lyn af gesit word? Will the 200kV line be shut down?	No.
What is in that space between the 220kV and 400kV line?	The Kries village.
Will it go over my house on Atsigas farm?	No, it will be 500m away at the closest point.
Is there no way to miss the mountain at Atsigas farm?	There is a technically viable path through the mountain range. Going around would mean we have to go through more farms.
Will it influence my radio, television and phones.	No, it gives of less electromagnetic interference at the 500m distance than the background normal electromagnetic interference.
Can I use the vehicle track that is created when the power line is built?	Yes. Both NamPower and the farm owner must have access through the gates on the line and the track.
You should use the locals for work. There is a lot of unemployment among them.	Noted
Will you remove Camelthorns from my farm (Atsigas)?	There will be an 80x80m area cleared for construction of towers every 500m. There will also be a jeep track cleared between each

Comments/questions	Response
	tower. This means the removal of any camelthorn trees will be avoided as far as possible. Gates on the farm will receive a dual lock to prevent NamPowers maintenance team and farmers from getting locked out.

APPENDIX A ATTENDANCE LIST

Attendance List – Public Meeting Meeting Proposed new NamPower Auas - Kokerboom 400 kV Transmission Line World Bank Update



Date: 12 July 2023 @ 10h00

Venue: NamPower Convention Centre

NAME	ORGANISATION	POSITION	TELEPHONE	E-MAIL	SIGNATURE
Norman van Zyl	Enviro Dynamics	EAP	0812739265	norman@envirod.com	
Simon van Zyl	"	N/A	"	"	SvZ
Roger Getze	Petrusdal No 3 No 422	Owner	0811223732	roger.getze@gmail.com	
Harry Eiman	Atsigas N. Wetsteunede 151	Owner	0812709649	eimancar@gmail.com	
Caroline Eiman	Atsigas N. Wetsteunede 151	Spouse of Owner	0812354818	eimancar@gmail.com	
Geo-Chris Rittmann	NamPower	Transmission	061 205 2721	Geo-Chris.Rittmann@nampower.com.na	
Calvin Sisamy	NamPower	Transmission	081124457	calvin.sisamy@nampower.com.na	
Smut Mateng	NamPower	Transmission	0814077820	smut.mateng@nampower.com.na	

APPENDIX B: BACKGROUND INFORMATION DOCUMENT 400KV TRANSMISSION LINE

July
2023

Environmental Impact Assessment for the Proposed Auas-Kokerboom 400 kV Transmission Line

Background Information Document



1 INTRODUCTION

NamPower intends constructing a 400kV transmission line approximately parallel to the existing 200kV transmission line from the Kokerboom substation, near Keetmanshoop, to the Avas Substation, near Dordabis. The new transmission line is of national importance, to assist in securing the supply of electricity to Namibia and open up opportunities for selling power to the Southern African Power Pool.

An Environmental Impact Assessment was completed for the project by Lithon Project Consultants in 2020. Part of this process involved stakeholder engagement in 2016, as well as in 2020. An Environmental Clearance Certificate was obtained from the Ministry of Environment, Forestry and Tourism in 2021, to construct the power line.

NamPower is currently applying to the World Bank for funding of the project, which will entail the following:

- The new Avas-Kokerboom 400kV Transmission Line, with associated infrastructure at both substations such as switchgear and reactors

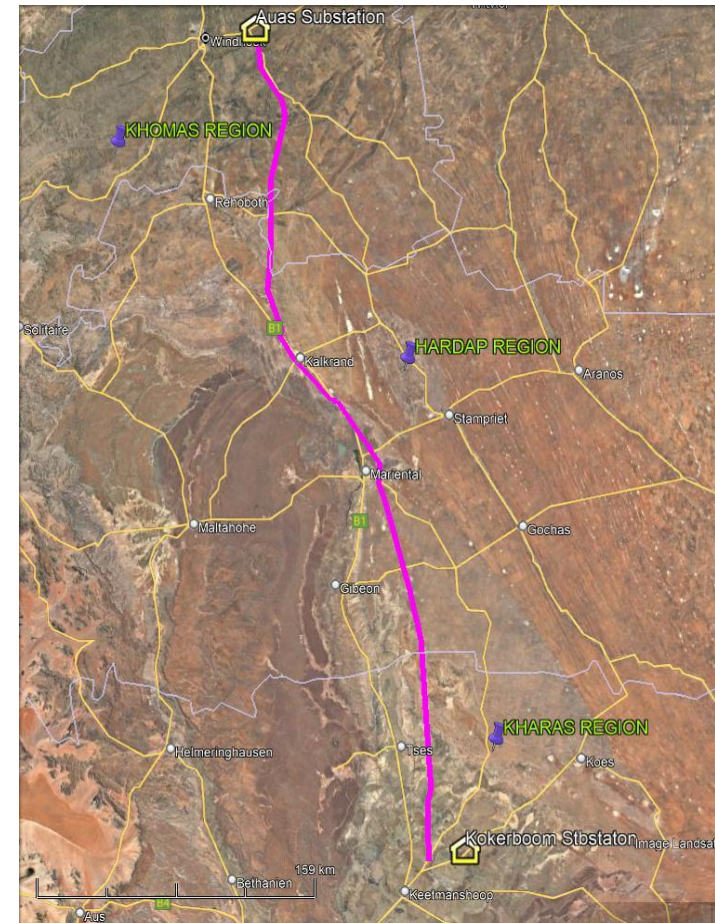


Figure 5: Locality of the proposed 400kV power line from Kokerboom substation near Keetmanshoop, to Avas substation, near Dordabis, Namibia.

- A Battery Energy Storage System (BESS) to be installed at Lithops Substation, that will enable NamPower to store energy generated by, amongst other, renewable sources such as solar or wind energy to allow utilisation of such energy when these resources are not available, such as after sunset.

Part of the funding requirements of the Bank is commitment to its Environmental and Social Framework (ESF), (<https://thedocs.worldbank.org/en/doc/837721522762050108-0290022018/original/ESFFramework.pdf>). Enviro Dynamics has been appointed to ensure the project meets these requirements. As part of this process, we are involving all stakeholders in order to get updated information about project progress and to be afforded a final opportunity for questions and comments, before project implementation commences.

2 WORK DONE TO DATE

The 2016 – 2020 Environmental Impact Assessment, with accompanying consultation with affected parties, focussed on avoiding ecological and social impacts as far as practically possible. Two main route alternatives were considered and the current alternative is preferred financially, technically and ecologically. During 2020 NamPower continued to consult with farm owners and bird specialists, adapting the route as feasible, to avoid settlements, lodges, farmsteads, views, and important habitats. The current route has therefore undergone rigorous consideration. An excerpt from the findings of the

2020 Environmental Impact Report is provided below in Appendix A and the full documents are available on request.

3 PURPOSE OF THIS CONSULTATION

Your inputs are welcomed for the following purposes, keeping in mind national interests and the broader context of the route:

- Final inputs to the route
- Issues to be addressed during construction (e.g. nuisances on farms caused by construction teams)
- Methods for effective stakeholder communication to and feedback from the project team during construction (effective grievance redress mechanisms).

4 STAKEHOLDER ENGAGEMENT OPPORTUNITIES

Questions and comments may be sent in one of the following ways:

- Send your written inputs to the e-mail address provided below;
- Attend meetings communicated; or
- Contact us for a focal meeting

Contact details:

Stephanie van Zyl

E-mail: Stephanie@envirod.com

Tel: 0811287002

APPENDIX A: EXERPT MAIN FINDINGS FROM 2020 EIADOCUMENT (Enviro Dynamics, 2020).

FINDINGS

The most significant biophysical and socio-economic impacts related to the proposed construction and operation of a new transmission line from the Kokerboom substation to Auas substation can be summarised as follows:

- **Impact on vegetation:** Because of the linear nature of the project, the impact on vegetation is expected to be without any red flags. The loss of protected tree species, specifically Camel Thorn is a concern. This impact rates medium and can be reduced to achieve a low significance with proper vegetation management.
- **Erosion and flooding risk:** If the 1:100 flood line is avoided along the route, then potential erosion and flood risk can be largely avoided. The remaining impacts can be mitigated by introducing erosion protection along the bases of the pylons and along the tracks.
- **Impact on birds:** The project area supports a relatively high diversity of species with bird and red data species, including vultures, eagles, and bustards that are particularly vulnerable to power line collisions. The main impact pertaining to birds is related to potential collisions once the line is operational. The bird assessment initially recommended that the western route be followed to avoid sensitive bird areas and to stagger the line with the existing 400kV route as mitigation. This option is problematic for NamPower, however, since the new 400kV line would have to cross the existing 220kV line, causing high risks in terms of potential power outages. A review has been done on this recommendation (Ecoserve, 2020), indicating that the differences in impact between the two routes are only marginally different. Therefore, it is proposed that the eastern route be followed (route currently proposed). The avifauna specialist accepts this route, on condition that it be used for monitoring purposes and that the line be marked. Mitigation measures have been included in the Environmental Management Plan to address bird-powerline interactions. The significance of this impact is high if no mitigation is implemented and can be reduced to a moderate significance with mitigation. Ongoing monitoring is crucial for keeping a watch on the mortalities in the project area as well as on the effectiveness of the mitigation to be implemented.
- **Social impacts:** The most significant impacts include disruption to farm management and changed sense of place. For some farmers the key impact will be during construction when the team interferes with and could potentially introduce nuisances on their farms such as noise, dust, security risk, poaching, etc. to their land. This impact will continue during operation when maintenance is carried out on the line. Some owners are concerned who already have a number of lines crossing their land. For some who place a high value on view sheds, their sense of place will change. Interaction with

the farm owners has been ongoing throughout the project, including a new set of focal meetings after this report was initially circulated in November 2019. Several adjustments were made to the route to accommodate the concerns of farm owners and to avoid sensitive receptors such as tourism establishments, and homesteads. The resulting route finally presented is acceptable to all farm owners consulted, except one instance where the environmental and technical costs of moving the line would be greater than the original proposal. The social impacts are generally of low to medium significance for the entire route, given a well-planned management strategy is implemented during construction.

- **Impact on archaeology:** Three sensitive sites have been discovered along the route, including one burial cairn, a grave and a graveyard. These are not directly on the route, but may be implicated during construction and operational activities in the area, particularly vehicles driving on the access track. The sites should either be marked and protected, or if this is not possible, removed completely before construction commences. The impact on these sites is rated high and the careful consideration of how to protect them is crucial.


RECOMMENDATIONS






In light of what can be concluded regarding the potential impacts associated with the proposed transmission line, NamPower will be able to reduce the significance of most of these to acceptable levels if they implement the mitigation measures outlined in both the Construction and Operational EMP. It is therefore important the EMP is audited to ensure compliance and that monitoring takes place as outlined therein otherwise the impacts identified will remain unacceptable. Emphasis is placed on the monitoring of avifauna mortalities and the effectiveness of bird markers along the route, as well as on the control of operations during construction and operation to avoid undue nuisances and losses to farm owners.

APPENDIX C: E-MAIL COMMUNICATION


400Kv TRANSMISSION LINE


PROPOSED AUAS-KOKERBOOM 400Kv TRANSMISSION LINE INFORMATION AND INVITATION


 **stephanie@envirod.com**
To: 'norman@envirod.com'
Cc: 'Van Der Merwe, Martin'
Bcc: 'gastell@way.na'; 'ute@go-nam.com'; 'amowes@unam.na'; 'feroplumbing@gmail.com'; 'drickets@unam.na'; 'ingemarCH@postfin.com.na'; 'ute@go-nam.com'; 'jamytraut@gmail.com'; 'rottchenm@gmail.com'; 'ncelento@novelmo.com.na'; 'eimancar@gmail.com'; 'gellap-ost@mawf.gov.na'; 'lloster02@icloud.com'; 'calexander@unam.na'; **+38 others**

Wed 05/07/2023 7:37 pm

 You forwarded this message on 07/07/2023 3:05 pm.

 AU-KO 400kV Final Route received 27 June 2023.kmz 9 KB

 Auas-Kokerboom 400kV Background Information Document 5 July 2023.pdf 194 KB

Dear Stakeholder,

Consultants of NamPower have previously communicated to you, as a land owner or representative, about this above project. The route was subsequently adjusted to accommodate land owners' concerns as far as possible, and your comments were taken into account in the documentation.

We are reaching out to you once again with the final route for your information and inputs, should you have any. Attached please find further information, as well as the final route in KMZ format, which you may study in Google Earth.

Kindly respond with any further questions or concerns, and/or attend the following meeting:

Date: Wednesday, 12 July, 2023, 10h00

Venue: NamPower Convention Centre

Best regards,



Stephanie van Zyl
Environmental Assessment Practitioner
P O Box 4039, Windhoek, Namibia
8 Demonte St, Auesblick, Windhoek, Namibia
Tel +264833305891 Cell +264(81)1287002



RE: PROPOSED AUAS-KOKERBOOM 400Kv TRANSMISSION LINE INFORMATION AND INVITATION

 **stephanie@envirod.com**
To: 'Rob Simmons'; 'norman@envirod.com'
Cc: 'john.pallett@saiea.com'; 'chrisbrown.namibia@gmail.com'; 'Van Der Merwe, Martin'; 'ecoserve@iway.na'

Mon 10/07/2023 11:28 am

 APPENDIX H1 AVIFAUNAL ASSESSMENT AMENDMENT.pdf 751 KB

Dear Rob,

Thank you very much for your inputs. We agree that staggering is very important, and we assume that staggering is a given. I will amend the statement to reflect this.

Your conditions, namely that the 400kV pylon height resembles that of the 220kV pylons as far as possible, has been presented and will be again, with all the other monitoring and marking requirements.

Martin, please confirm whether this is still feasible, as per Rob's previous assessment, which still stands.

Best regards,



Stephanie van Zyl
Environmental Assessment Practitioner
P O Box 4039, Windhoek, Namibia
8 Demonte St, Auesblick, Windhoek, Namibia
Tel +264833305891 Cell +264(81)1287002



BESS PROJECT AT LITHOPS

FW: LITHOPS BESS PROJECT BACKGROUND DOCUMENT

 **Pandeni, Connie <Connie.Pandeni@nampower.com.na>**
To:
Cc: Mingeli, Ben; Ilende, Elifas; Bailey, Fred; Christina.Mansfeld@fma.fichtner.de

Tue 07/11/2023 4:30 pm

 NamPower_Background Information Document for BESS at Lithops Substation_07Nov23_v1.0(Clean).pdf 636 KB

As part of NamPower's short-to-medium term strategy to fulfil its future energy demand, NamPower is exploring the feasibility of the integration of Battery Energy Storage Systems (BESS) Project into the transmission network with an estimated capacity of 45 MW / 90 MWh and market standard lithium-ion technology at the NamPower Lithops Substation outside Swakopmund.

NamPower have appointed Fichtner GmbH to conduct the Environmental and Social Assessments (ESIA) for the Project and produce a Scoping Report as well as an Environmental and Social Management Plan (ESMP), as per the World Bank Environmental and Social Framework (ESF) and the respective Environmental and Social Standards (ESS) and Namibia's Environmental Management Act No. 7 of 2007 and its Regulations.

As a possible Affected and/or Interested and Affected Stakeholder, we would like to share the Lithops BESS' Background Information Document (BID) for your inputs and comments.

Please channel all inputs and or comments to: Christina.Mansfeld@fma.fichtner.de and/or Connie.Pandeni@nampower.com.na

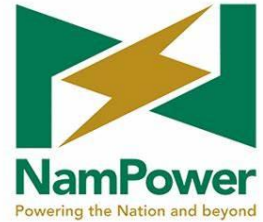
Kind regards

Connie Pandeni
Senior stakeholder Liaison | Generation Capital Projects Section

Tel: +264 61 205 2974
Email: connie.pandeni@nampower.com.na
Web: www.nampower.com.na

PO Box 2864, Windhoek, Namibia,
NamPower Centre, 15 Luther Street



APPENDIX D: BACKGROUND INFORMATION DOCUMENT, BESS**Background Information Document (BID)****NAMPOWER Battery Energy Storage Systems (BESS)****1. Aim of this Document**

This BID aims to provide stakeholders / Interested and/or Affected Parties (IAP) with the following information:

- Brief description of the proposed project.
- Motivation for/or desirability for the proposed project.
- The potential key issues as identified during the initial assessment phase, both positive and negative which may arise as a result of the proposed project.

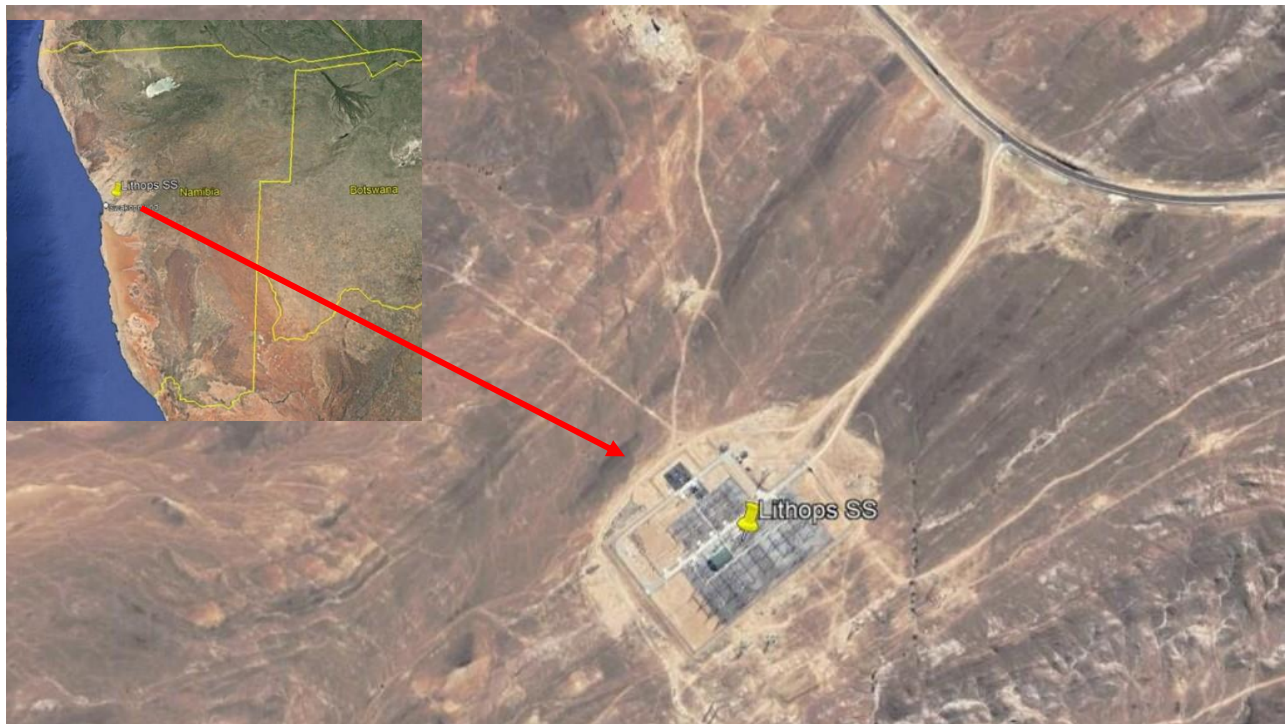


Figure 1: Lithops Substation Location

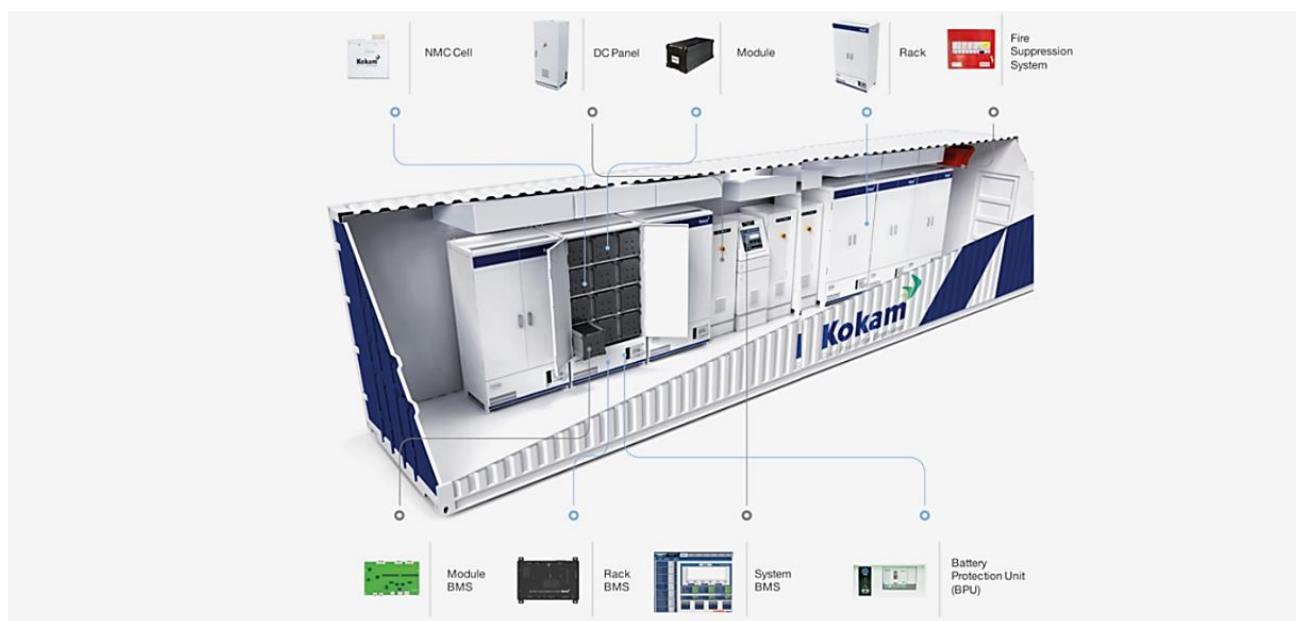


Figure 2: Typical containerized BESS



Figure 3: Typical containerized BESS facility (source: smart-energy.com)

2. Introduction

As part of NamPower's short-to-medium term strategy to fulfil its future energy demand, NamPower is exploring the feasibility of the integration of Battery Energy Storage Systems (BESS) Project into the transmission network with an estimated capacity of 45 MW / 90 MWh and market standard lithium-ion technology.

Fichtner has been appointed by NamPower to conduct the Environmental and Social Assessments (ESIA) for the Project and produce a scoping Report as well as Environmental and Social Management Plan (ESMP), as per the World Bank Environmental and Social Framework (ESF) and the respective Environmental and Social Standards (ESS) and Namibia's Environmental Management Act No. 7 of 2007 and its Regulations.

3. Project Description and Motivation

The Government of Namibia is committed to environmental protection and socioeconomic and sustainable development, as expressed, and articulated in the Environmental Management Act No. 7 of 2007, whose objective is to prevent and mitigate the significant effects of activities on the environment.

The following two phases are being conducted as part of the project:

- a) Phase I: consisted of a detailed technical feasibility study to determine the required BESS application for integration into the grid, its operating concept, sizing, technology, location, and time of implementation to suit the Namibian energy market. This included a draft Scoping Report and overview (Table of Content) of an Environmental and Social Management Plan (ESMP), a preliminary carbon credit and avoided emissions calculation, and a high-level financial feasibility assessment.
- b) Phase II: consists of the design basis report, the detailed financial feasibility study and economic modelling of the BESS project. This will serve as the basis for project appraisal by NamPower, as well as for NamPower's discussions with the regulator (Electricity Control Board) on a suitable tariff regime to cover the long-term cost of the BESS project. This phase also includes the detailed project risk assessment report, detailed carbon credit and avoided emissions calculation, as well as the Scoping Report including an Environmental and Social Management Plan (ESMP) for submission to the Ministry of Environment, Forestry and Tourism (MEFT).

A Battery Energy Storage System (BESS) is comprised of three major components: the battery which is the energy container; the power conversion system/inverter, which interfaces the DC battery system to the AC power system; and the power plant controller which governs, monitors, and executes the intended functions of the energy storage application.

Since the BESS needs to be operated economically within the current power system, BESS must be designed to meet all economic, legal, and safety-related requirements that best suits its intended use case.

BESS can be placed either in a building or module-wise within containers. In this present project, a container concept is planned. Several battery modules will be installed in one container with their respective cooling system, and battery management systems. It is estimated that a total area of approximately 2 hectares will be utilized at an existing substation of NamPower.

Project specifics

The NamPower grid shows strong feasibility during normal operation. The final decision to install the BESS at Lithops substation is taken in terms of arbitrage. This is a suitable location for the BESS installation:

- This location is close to high-loading mine area and the BESS could reduce the inrush current when the heavy machinery is connected.
- Power fluctuations from upcoming PV projects can be compensated directly at the source.
- BESS will allow PV penetration to be increased beyond the current committed expansion plans in the region. The demand here for captive PV power plants is especially interesting due to the large industrial loads.

4. The Affected Environment

The Lithops Substation falls within the Dorob National Park. The Lithops substation already belongs to NamPower, and no additional land would be required for the BESS. The BESS would be located at the Lithops SS with no additional access roads required for construction or operation and no other additional infrastructure needed either.

The Dorob National Park was proclaimed in 2010 and covers the central Namib desert. This area also contains a few surprises. Extensive lichen fields are found north of Wlotzkasbaken and Cape Cross, while the Messum Crater in the north contains San rock paintings and archaeological sites from Damara nomads. Site visit and desktop review will be done to ensure that the site surrounding Lithops does not contain any Rock art, lichens, or plants such as the welwitschia as part of ensuring the immediate environment remain unaffected.

5. Potential Impacts Identified

The following potential impacts may result from the proposed project.

Table 1: Impacts Identified

Impact	Description
--------	-------------

Hazardous Substances	Hazardous substances in the form of chemicals (e.g. sulfuric acid) are an integral part of the workings of batteries. Furthermore, the battery includes the use of heavy metals (lead).
Noise	The BESS will emit acoustic noise to their vicinity when in operation from power transformers and cooling compressors and fans.
Disposal of Waste	Hazardous landfill sites are generally the main route for disposal of a hazardous substance. However, other mechanisms are available. These mechanisms include incineration and disposal of the hazardous waste to land (not in a government owned landfill site).

6. Possible Mitigation Measures

The following mitigation measures are envisaged to remediate the potential impacts associated with the proposed project.

Table 2: Mitigation Measures

Impact	Proposed Mitigations
Hazardous Substances	<p>BESS should have secondary containment systems that prevent environmental release following spill or damage.</p> <p>Some lithium-ion batteries under development use an aqueous electrolyte which significantly reduces the hazards associated with organics and acids.</p> <p>Lithium-ion batteries require battery management systems to monitor and protect cells from overcharging or damaging conditions.</p> <p>Large BESS systems should be designed with appropriate fire detection and suppression systems.</p>
Noise	<p>Component selection: Special low-noise cooling compressors, fans and transformers</p> <p>Barriers</p> <p>Provision of ear protection equipment.</p>
Disposal of Waste	<p>Owners should consider provisions for disposal at end of life to ensure proper disposal. There are currently a limited number of facilities that recycle lithium-ion batteries.</p> <p>The owner may request the supplier to provide a warranty for certain parts or whole modules.</p> <p>Some programs provide for disposal and decommissioning of battery systems at end of life.</p> <p>The project should have a set aside for decommissioning and disposal, e.g. in form of a reserve account.</p>

	<p>Decommissioning and Disposal costs at end of life should be considered and factored into any facility financial model. Disposal costs tend to increase with system size.</p> <p>Because lithium battery systems currently have negative scrap value, it is important that the decommissioning plan is sufficiently well financed to cover the full costs of decommissioning and removal from site.</p>
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7. How to register comments

To register any comments as a stakeholder/ Interested and/or Affected Parties (IAP) for the proposed project, please submit **in writing** your complete contact details; your interest in the proposed project (direct business, financial, personal, etc.) as well as your comments and/or concerns to Fichtner as listed below:

Fichtner: Christina Mansfeld	NamPower: Connie Pandeni
E-Mail Address: Christina.Mansfeld@fma.fichtner.de	E-Mail Address: Connie.Pandeni@nampower.com.na
Postal Address: Fichtner GmbH & Co. KG Sarweystraße 3 70191 Stuttgart Germany	Postal Address: NamPower Center 15 Luther Street P O Box 2864, Windhoek
Telephone Nr.: <u>+27 (72) 4490353</u>	Telephone Nr.: 061 205 2974



Figure 4: Indicative location of BESS at Lithops substation

APPENDIX E: PROJECT GRIEVANCE MECHANISM

PROJECT STAKEHOLDER GRIEVANCE MECHANISM

400 kV Auas - Kokerboom
Transmission Line

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Introduction and Background

NamPower undertakes to foster a constructive working environment for projects and commits to ensuring that the views and rights of both NamPower and its internal and external project stakeholders are collectively respected. The Grievance Resolution Procedures have therefore been instituted to:

afford all project stakeholders the opportunity to unmaliciously lodge individual or group grievances with the Project Director/Manager in writing (email or letter); without prejudice to contracts/interests/roles, and

ensure a fair, consistent, and diligent stakeholder grievances resolution system.

However in instances of fraud or any impropriety conduct by a NamPower staff member relating to project(s), please be advised that NamPower has a confidential fraud hotline toll free number: 0800 66 999 or E-mail address: nampower@tip-offs.com or Website address: www.tip-offs.com.

Grievances Resolution Procedures

Aggrieved project stakeholders may submit written grievances to the Project Director/Manager by email or letter for registration, evaluation, investigation, and resolution. The project team will adopt procedures as illustrated in

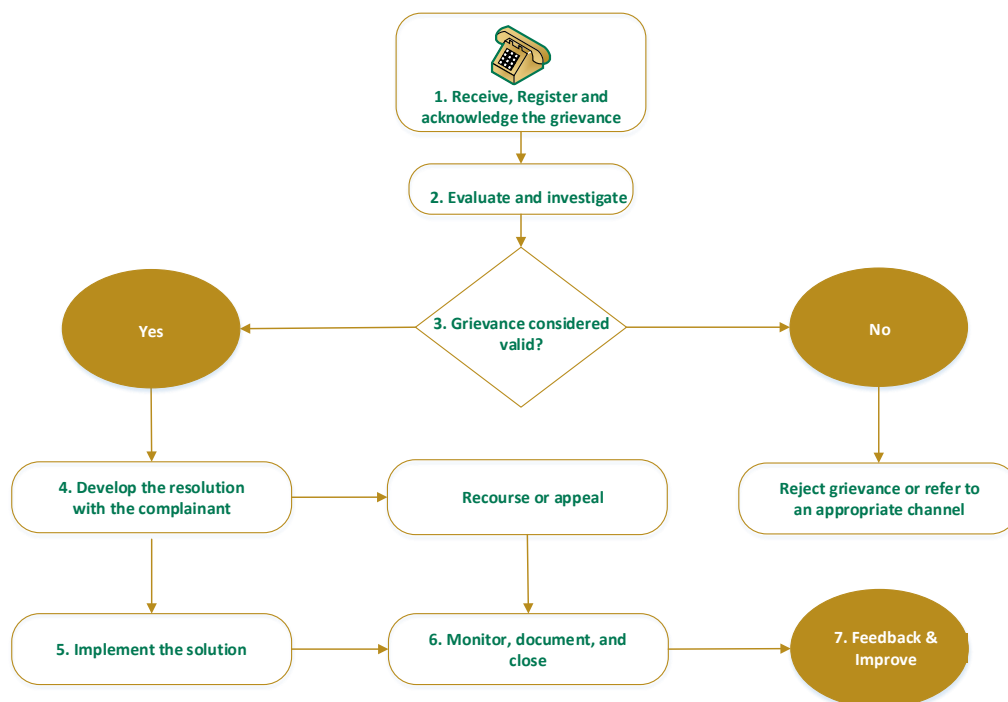


Figure 1: Stakeholder Grievance Resolution Procedure Flowchart

to amicably resolve logged grievances.

Grievance Form

Please submit your grievance to the project team by completing the Grievance Form.

GRIEVANCE FORM <i>(Please forward your completed form to the Project Manager)</i>	
<p>➤ Case No.: _____</p> <p>➤ First Name and Surname: _____</p>	<div style="display: flex; align-items: center; margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">I request that my personal / company details not be disclosed.</div> </div> <div style="display: flex; align-items: center;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">I consent that my personal / company details may be disclosed.</div> </div>
<p>➤ Contact details:</p> <p><i>(Please indicate the preferred method of communication: by post, email, or phone)</i></p>	<div style="display: flex; align-items: center; margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">By Post <i>(Please enter the correspondence address):</i></div> </div> <div style="margin-left: 100px;"> <div style="border-bottom: 1px solid black; width: 400px; margin-bottom: 5px;"></div> <div style="border-bottom: 1px solid black; width: 400px;"></div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">By phone: _____</div> </div> <div style="display: flex; align-items: center;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">By E-mail: _____</div> </div>
<p>➤ Grievance Description:</p> <p><i>(Please indicate the subject of the grievance; date of occurrence, location relating to the grievance, persons involved in the grievance and effects of the ensuing situation)</i></p>	<p>Subject: _____</p> <p>Date: _____</p> <p>Location: _____</p> <p>Persons involved: _____</p> <p style="margin-left: 100px;">_____</p> <p style="margin-left: 100px;">_____</p> <p>Effects of the ensuing situation:</p> <p>_____</p> <p>_____</p>
<p>Date of incident / occurrence of the subject of the grievance / emergence of the case:</p>	<div style="display: flex; align-items: center; margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">One-time incident/grievance (Date): _____</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">Happened often <i>(Indicate how many times):</i> _____</div> </div> <div style="display: flex; align-items: center;"> <input style="width: 40px; height: 20px; border: 1px solid black;" type="checkbox"/> <div style="margin-left: 10px;">Ongoing <i>(A currently existing problem).</i></div> </div>
<p>Recommendations (Please propose measures that would provide solutions to the problem):</p> <p>_____</p> <p>_____</p>	
<div style="display: flex; justify-content: space-between;"> <div>Signature: _____</div> <div>Date: _____</div> </div> <p>Please forward this form to (Name & Surname): _____</p> <p>Postal Address: _____</p> <div style="display: flex; justify-content: space-between;"> <div>Email: _____</div> <div>Phone Number: _____</div> </div>	

Corporate Communication and Marketing
+ 264 (61) 205 4111 register@nampower.com.na

Mr. Martin van der Merwe **(Project Manager)**
Senior Engineer: Transmission Capital Projects
Tel: +264 61 205 2724
Fred.Bailey@nampower.com.na

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