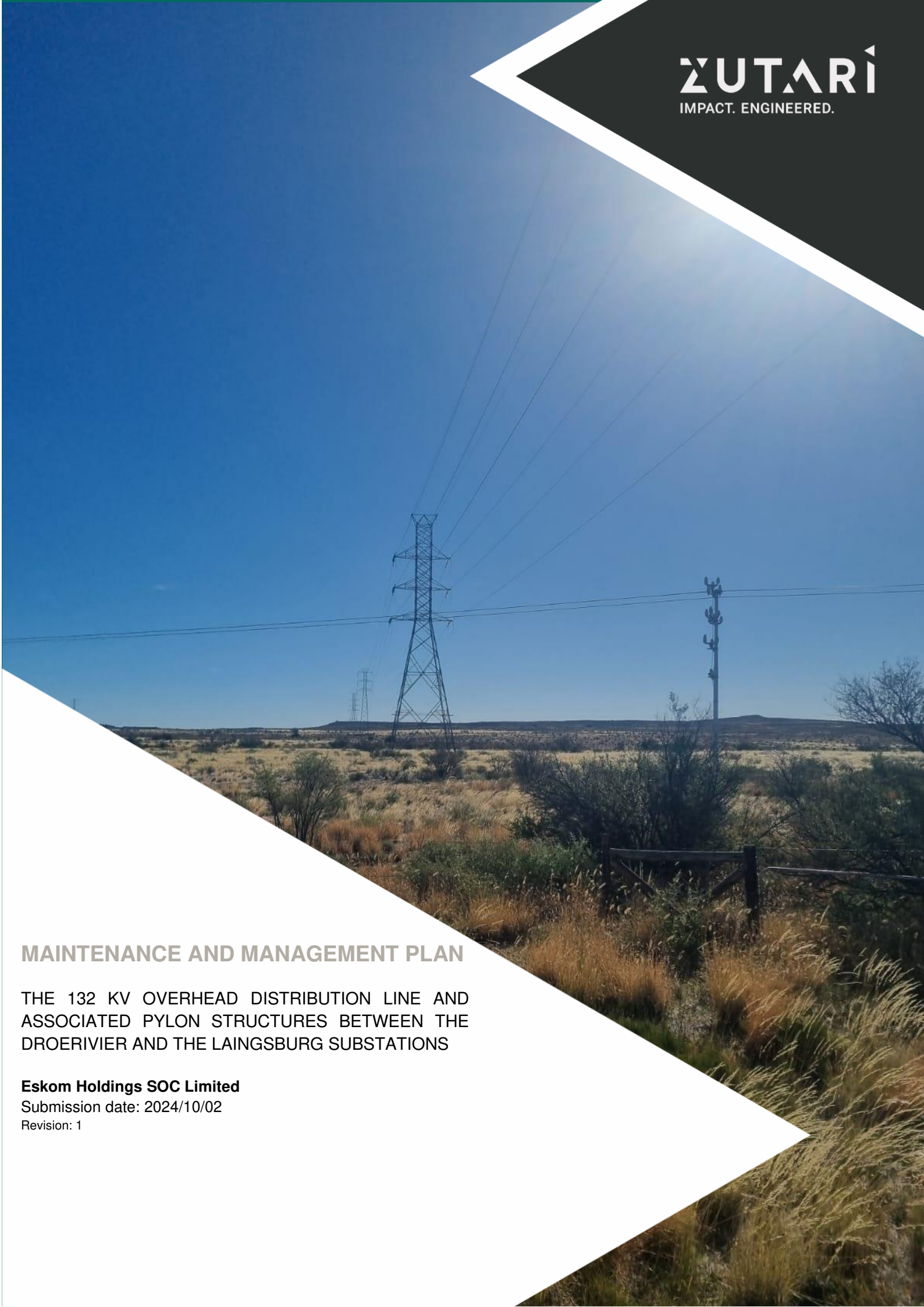




MAINTENANCE AND MANAGEMENT PLAN

THE 132 KV OVERHEAD DISTRIBUTION LINE AND
ASSOCIATED PYLON STRUCTURES BETWEEN THE
DROERIVIER AND THE LAINGSBURG SUBSTATIONS

Eskom Holdings SOC Limited

Submission date: 2024/10/02

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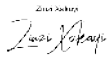
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ABBREVIATIONS

Abbreviation	Meaning
BAR	Basic Assessment Report
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act, No. 43 of 1983
CR	Critically Endangered
CV	Curricula Vitae
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and Environment
DWS	Department of Water and Sanitation
EA	Environmental authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners' Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EN	Endangered
ESA	Ecological Support Area
ESG	Environmental, Social and Governance
GA	General Authorisation
GIS	Geographic Information Systems
GN	General Notice
IAP	Invasive Alien Plant
IBA	Important Bird Areas
IFC	International Finance Corporation
kV	Kilovolt
LC	Least Concern
MAP	Mean Annual Precipitation
MMP	Maintenance and Management Plan
NEMA	National Environmental Management Act, No. 107 of 1998
NFEPA	National Freshwater Ecosystem Priority Area
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act, NO. 36 of 1998
PA	Protected Area
PES	Present Ecological State
PPP	Public Participation Processes
PV	Photovoltaic
RLE	Red List of Ecosystems
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Authority
SANS	South African National Standards
SCC	Species of Conservation Concern
VU	Vulnerable
WCBSP	Western Cape Biodiversity Spatial Plan
WMA	Water Management Area
WUA	Water Use Authorisation
WUL	Water Use Licence

1 INTRODUCTION

Zutari (Pty) Ltd (hereafter referred to as the Environmental Assessment Practitioner (EAP) or Zutari) was appointed by Eskom Holdings SOC Limited (hereafter referred to as the applicant or Eskom) to compile a Maintenance and Management Plan (MMP) for the 132 Kilovolt (kV) overhead line and associated pylon structures between the Droërivier and Laingsburg substations in the Central Karoo District Municipality of the Western Cape Province. This appointment was prompted by the collapse of four lattice towers on the 132 kV double-circuit Leeu Gamka – Luttig line due to strong winds in the Leeu Gamka area. The proposed maintenance project will enable Eskom to undertake necessary maintenance activities along the 200 km distribution line, thereby ensuring optimal functionality and reducing the risk of outages or failures that could disrupt the power supply.

Authorisation to adopt the MMP will be required from the Department of Forestry, Fisheries and the Environment (DFFE) for activities listed under the National Environmental Management Act, No. 107 of 1998 (NEMA) and its Environmental Impact Assessment (EIA) Regulations [General Notices (GN) R982, R983, R984, and R985 of December 2014]. Given the proximity of the proposed maintenance activities to an overhead line that traverses numerous inland aquatic ecosystems, the project constitutes Section 21 (c) and (i) 'water uses' under Section 39 of the National Water Act, No. 36 of 1998 (NWA), thus requiring Water Use Authorisation (WUA) - either by the form of a Water Use Licence (WUL) or a General Authorisation (GA) - from the Department of Water and Sanitation (DWS).

The identification of the listed activities in accordance with the proposed works indicates that an MMP will be necessary for the interventions along the power line between the Droërivier and Laingsburg substations. This will facilitate future repair work without the need to apply for approval again from the relevant authority. As part of the application process, a terrestrial biodiversity study and a freshwater study were conducted to better inform the method statements and required mitigation measures.

Note: This MMP excludes the expansion and/or relocation of any structures and infrastructure as per the definitions provided in NEMA.

1.1 PROJECT BACKGROUND

A pre-application meeting was held on 7 August 2024 between the EAP's teams, the applicant (Eskom), and officials from the DFFE. The purpose of the meeting was to discuss and confirm the necessary regulatory processes to follow when maintenance of the power line and associated pylon structures is required, as well as the process to authorise the replacement of pylon structures planned to be erected in order to reinforce support, particularly in areas where structures have collapsed. During the meeting, the DFFE officials could not provide clear guidance, stating that a way forward would be communicated to the EAP and the applicant once they had conducted internal discussions with their colleagues.

Following the pre-application meeting, on 8 August 2024, an official from the DFFE advised the EAP's team to send their request to the department's IQ unit due to confusion regarding the interpretation of the planned activities. An IQ request was submitted on 20 August 2024, and a response was received on 11 September 2024. In that response, it was confirmed that a MMP for listed and specified activities includes provisions for exclusion from applying for an adopted MMP. However, other triggered listed and/or specified activities will still require environmental authorisation (EA).

After considering the above, the applicant advised the EAP to continue with the application for the adoption of an MMP.

1.2 PROJECT LOCALITY AND ACTIVITY DESCRIPTION

The project is located between the Laingsburg (in Laingsburg) and Droërivier (near Beaufort West) substations, within the Laingsburg Municipality, the Prince Albert Local Municipality and the Beaufort West Municipality in the Western Cape Province (refer to **Figure 1-1** below).

The Eskom distribution line crosses multiple quaternary catchments between Laingsburg and Droërivier, primarily located in Secondary Catchment J2, with some areas toward Laingsburg in J1 (see **Figure 1-2**). The entire distribution line is situated within the Breede-Olifants Water Management Area (WMA). The terrain is mostly flat, with some low, undulating hills. For much of its route, the power line runs parallel to the N1 highway, crossing the highway at various points.

Sections of this line were commissioned in the 1960s and now require urgent maintenance in the Leeu Gamka region. Other sections may need similar maintenance in the future, as the area is prone to damaging winds and flooding. An assessment of the structural condition of the pylons indicates that the earthing (tower footing) of several pylons may require reinforcement or reconstruction (see **Table 1-1**). Work will be conducted within a 32 m servitude along the distribution line.

Table 1-1: Asset health index (supplied by Eskom) for pylon structures along the Laingsburg and Droërivier substations

			Asset health index								
Smallworld Location Description	Tower (steel, concrete, woodpole)	Year commissioned	Foundation	Earthing (tower footing)	Tower (steel, concrete, woodpole)	Phase Conductor / jumpers	Line hardware (dampers etc)	Insulators and hardware	Earthwire	Score	Rating
BOTESLAND TRACTION / WELTEVREDE TRACTION 1 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
BOTESLAND TRACTION / WELTEVREDE TRACTION 2 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
DROERIVIER / STEINS TRACTION 1 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
DROERIVIER / STEINS TRACTION 2 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LEEU GAMKA / LUTTIG TRACTION 1 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LEEU GAMKA / LUTTIG TRACTION 2 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LEEU GAMKA / WELTEVREDE TRACTION 1 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LEEU GAMKA / WELTEVREDE TRACTION 2 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LUTTIG TRACTION / STEINS TRACTION 1 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B
LUTTIG TRACTION / STEINS TRACTION 2 132kV OVERHEAD LINE	Lattice	1963	B	D	A	B	B	B	B	78.75	B

Urgent maintenance is required in the vicinity of Leeu Gamka due to wind damage to pylons that were constructed over 60 years ago. In February 2024, four pylons collapsed as a result of high winds, leading to a power outage in the area and necessitating an emergency response for repairs. The previous installation was not compliant with the current South African National Standards (SANS) line design requirements. The proposed maintenance involves the following steps:

- Emergency temporary pylons were erected to maintain power until permanent pylons are approved and constructed.
- A section 1.8 km long, consisting of four failed pylons due to wind damage, will be replaced with six pylons. The increase in the number of structures is intended to comply with current SANS standards by reducing load and the risk of failure in an area with very high winds (see **Figure 1-3**).
- Lattice structures will be replaced with monopole towers, which have a smaller footprint. The work will primarily take place near the Koekemoer's River, which is crossed by the line (refer to **Figure 1-3**). This river joins the Leeu River approximately 300 m downstream from the line crossing.

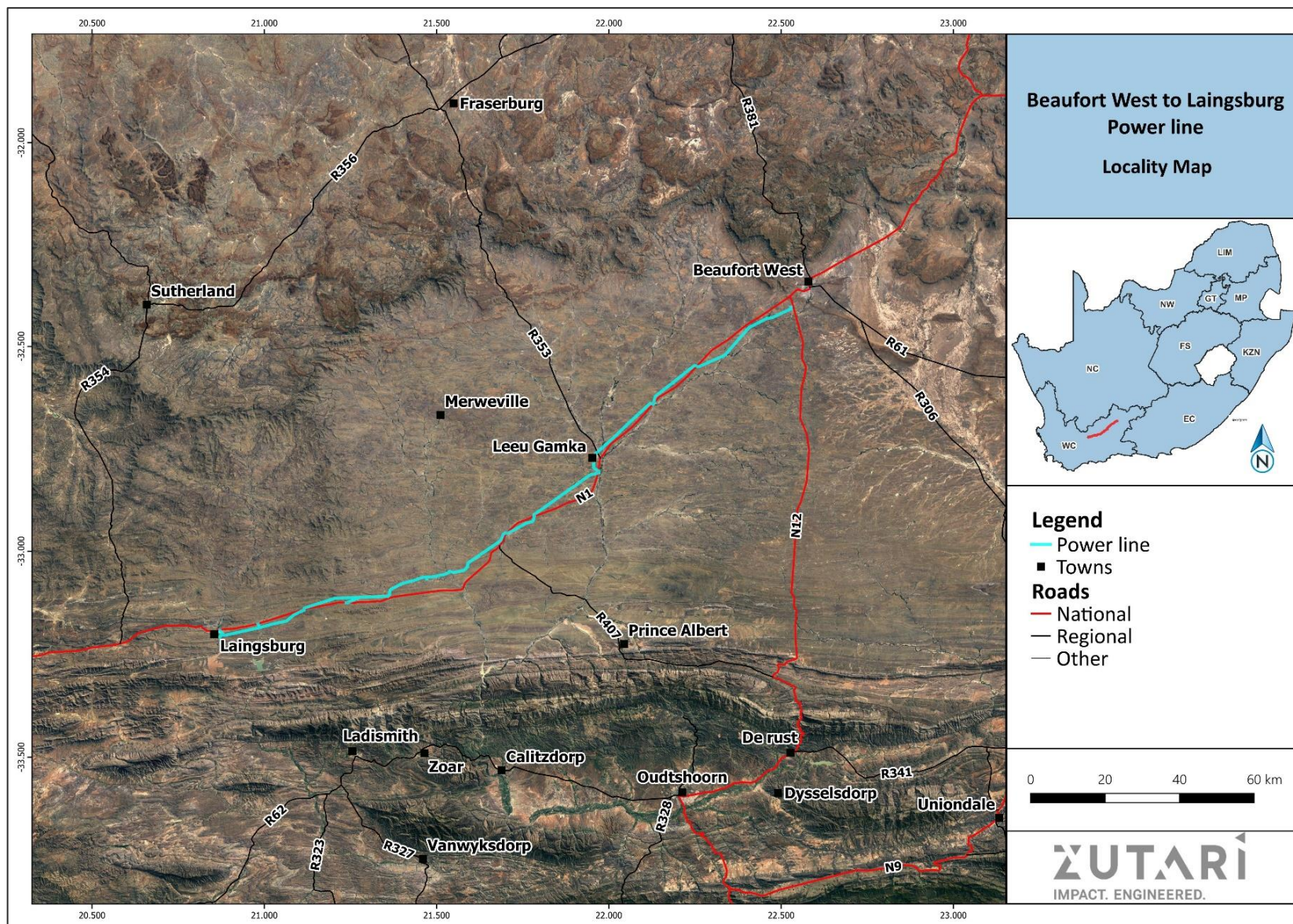


Figure 1-1: Locality Map (Excellence Ecology, 2024)

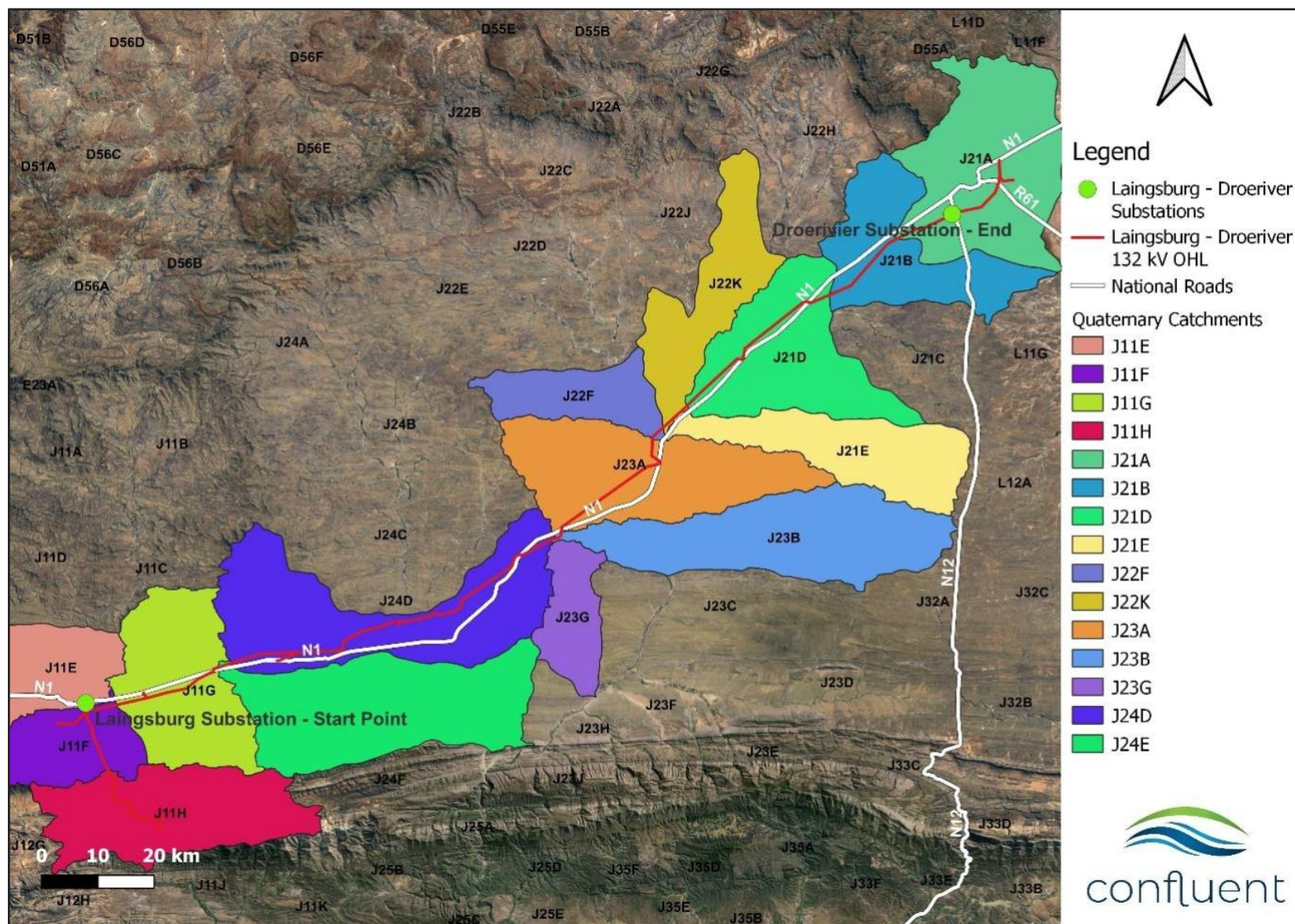


Figure 1-2: Quaternary catchments crossed by the power line between the Laingsburg and Droërivier substations (Confluent, 2024)

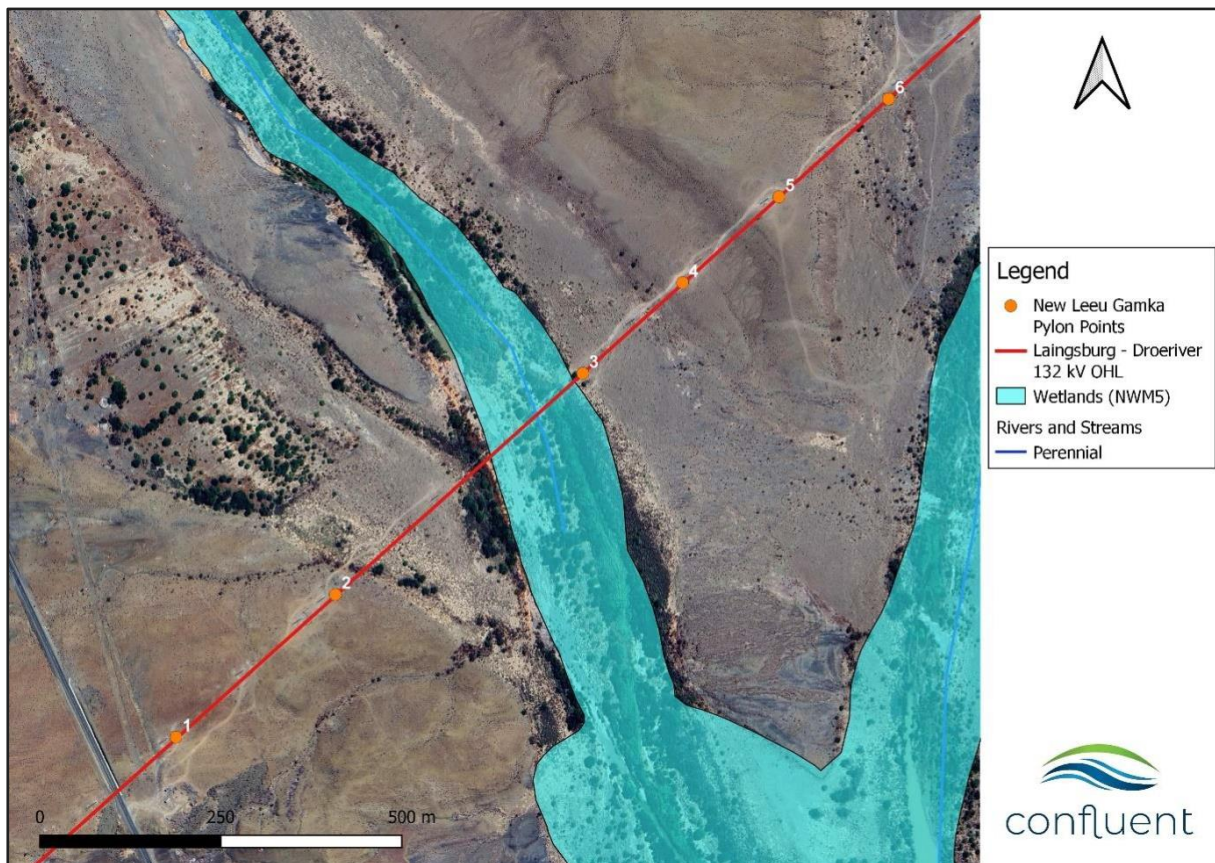


Figure 1-3: Location of proposed new pylon locations in Leeu Gamka with corresponding explanation in **Table 1-2**.

Table 1-2: Summary of the proposed relocation points to replace 4 pylons with 6 pylons along the existing distribution line in Leeu Gamka. Refer to **Figure 1-3** for the location of pylons.

Pylon Number	Description
1	New pylon located 20 m east of original foundation
2	New pylon located 5 m east of original foundation
3	New pylon located 40 m east of original foundation (out of mapped watercourse)
4	New additional tower
5	New pylon located 30 m west of original foundation
6	New additional tower

As can be seen by the example of required maintenance for the Leeu Gamka section of the line, typical work might require the replacement/addition/removal of pylon structures and associated stringing of lines. This may take place in the vicinity of watercourses or other sensitive habitats. Eskom has provided a scope of work for typical maintenance work anticipated. This work is summarised as follows:

- Site establishment which may involve the clearance of trees and other vegetation.
- Operation of vehicles (trucks, bakkies) and heavy machinery at the maintenance site.
- Access to maintenance sites by vehicles (trucks and bakkies) and heavy machinery.
- Access on foot by construction / maintenance teams to the maintenance site.
- Excavations, earthworks, mixing and pouring concrete for foundations.
- Laying out, assembling, and erecting pylons / poles.
- Stringing high voltage cables.
- Dismantling would involve the above processes in reverse.
- Removal of all waste products from the site.

1.3 MAINTENANCE MANAGEMENT PLAN OBJECTIVE

The objective of this MMP is to provide environmental management guidance through measures designed to manage the impacts that may result from maintenance activities associated with the approximately 200 km overhead distribution line and the associated pylon structures between the Laingsburg and Droërivier substations.

This MMP binds all contractors, subcontractors, and other individuals working on the site to adhere to its terms and conditions throughout any maintenance activities related to the project.

Note: Approval of the MMP does not absolve the owner, contractor or any other parties of the general “duty of care” set out in Section 28(1) of the NEMA which states that “*Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment*”. Cognisance must be taken of the principles of sustainability as contained in Section 2 of the NEMA.

Accordingly, the MMP includes the following chapters:

- ▶ **Section 1** – Introduction, context and overview.
- ▶ **Section 2** – Legal framework
- ▶ **Section 3** – Data collection and assessment
- ▶ **Section 4** – Roles and responsibilities
- ▶ **Section 5** – Site-specific method statement
- ▶ **Section 6** – Monitoring and reporting.
- ▶ **Section 7** – Conclusion. This Section provides the EAP’s concluding remarks

1.4 MAINTENANCE AND MANAGEMENT PLAN PROJECT TEAM

Zutari has selected a team of experienced specialists and multi-disciplinary practitioners to execute this project (see **Table 1-3**). Full Curricula Vitae (CVs) of the EAP and project team are available in **Annexure A**. Specialist CVs are included in the respective specialist reports in **Annexure C**.

Table 1-3: Project Team

Role	Consultant	Company
EIA and Project Management		
Project Leader & Lead EAP	Jane Mahaba	Zutari
Project Staff (EAP)	Zinzi Portia Xakayi	Zutari
Project Staff	Louisa Viljoen	Zutari
Sub-consulting Specialists		
Freshwater Aquatics Assessment	Jackie Dabrowski	Confluent Environmental (Pty) Ltd
Terrestrial Biodiversity Assessment	Mari van der Westhuizen	Excellence Ecology
Palaeontological Compliance Statement	Marion Bamford	Marion Bamford Consulting

1.5 INDEPENDENCE

The NEMA EIA Regulations of 2014 (GN R982 of 2014) provide general requirements for EAPs and specialists to reduce the potential for bias in the environmental process. The first requirement is that the EAP should be independent (Regulation 13(1)(a) of GN R982 of 2014).

Neither Zutari nor any of its sub-consultants are subsidiaries or affiliated to Eskom nor is Eskom a subsidiary of Zutari. Furthermore, Zutari does not have any interests in secondary developments that may arise out of the adoption of the MMP. The EAP declaration of independence is appended in **Annexure D**.

1.6 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER, THE MMP PROJECT TEAM AND THEIR EXPERTISE TO CONDUCT THE MMP PROCESS

Annexure A includes the CVs for the environmental team from Zutari. The Zutari environmental team for this project includes Jane Mahaba, Zinzi Portia Xakayi and Louisa Viljoen. Their experience and capabilities are summarised below.

JANE MAHABA is employed as a manager and EAP at Zutari. She has a diverse background in environmental management. Her expertise includes permitting, stakeholder engagement, compliance monitoring, and auditing. She has also been involved in impact assessments, environmental monitoring, and public participation processes.

As a project manager, she has led integrated environmental management processes, such as environmental impact assessments and the development of environmental management plans. Additionally, Jane has contributed to research and development efforts related to environmental, social and governance (ESG) products, with a focus on green economies and waste management.

Her qualifications include a Bachelor of Science in Ecology and Zoology, certification as a natural scientist, and registration as an environmental assessment practitioner.

She is registered as a Certified Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP **registration no. 119631**) and is registered as a professional EAP with the Environmental Assessment Practitioners' Association of South Africa (EAPASA **registration no. 2019/1551**).

ZINZI PORTIA XAKAYI is a proficient environmental consultant at Zutari with extensive experience in diverse environmental projects. Her responsibilities include the compilation of Environmental Management Programmes (EMPrs), Basic Assessment Reports (BARs), EIA Reports, Environmental Screening Reports, Part 1 and Part 2 EA amendment applications and conducting WUL applications. With a background in geo-informatics and geographic information systems (GIS), Zinzi brings two years of invaluable experience gained in the private sector. Her specialization in spatial analysis, data processing, and mapping is complemented by technical skills such as data evaluation, digitizing, editing, and converting spatial and non-spatial data using tools like Esri ArcMap, GeoMedia, and QGIS.

Since joining Zutari, Zinzi has played a role in renewable energy projects, contributing to the compilation of BARs, EIAs, EMPrs, and conducting Public Participation Processes (PPP). Her expertise extends to feasibility screenings for photovoltaic (solar PV) projects in Limpopo, and she serves as an environmental compliance officer (ECO) for green building projects in Gauteng, where she conducts monthly audits and compiles ECO audit reports.

Furthermore, Zinzi has experience in managing projects, which includes conducting client meetings, meeting with various departments and competent authorities, sourcing information, collaborating with project teams, compiling technical and financial proposals, and preparing reports. She takes an active role in coordinating PPP and engaging with stakeholders.

She is registered as a candidate with the SACNASP (**registration no. 155265**) and is registered as a professional EAP with EAPASA (**registration no. 2022/6136**).

LOUISA VILJOEN is an environmental consultant at Zutari with over 4 years' experience in diverse environmental projects. Her experience includes managing projects, and preparing reports such as the compilation of EMPs, BARs, EIA Reports, EA applications, conducting WUL applications and conducting WUL and EA audits.

She has been involved in EIA and planning processes in South Africa, Guinea, Morocco, and Liberia, as required by relevant national legislation, financial institution performance standards and in terms of international requirements as EIA team leader and team member. These projects have included environmental assessments for projects such as mines and LNG storage and Solar. Many of these were completed to lender safeguard requirements, including the International Finance Corporation (IFC), and Equator Principles.

1.7 ASSUMPTIONS, LIMITATIONS AND GAPS IN KNOWLEDGE

In undertaking the investigation and compiling the MMP, the following has been assumed:

- ▶ The information provided by Eskom is accurate, and no information that could affect the outcome of the MMP process has been withheld.
- ▶ All information provided by the appointed specialists is complete, accurate, and true.
- ▶ The scope of this investigation is limited to assessing the environmental impacts associated with the 132 kV overhead line and the associated pylon structures between the Laingsburg and Droërvier substations.
- ▶ The MMP process is based on best practice guidelines that were available at the time of writing this report.
- ▶ Any additional permits or authorisations required for maintenance activities under other legislation will be handled by the applicant outside of this process.

Any gaps that have been encountered by the specialists are identified in their respective assessments (**Annexure C**).

2 LEGAL AND PLANNING CONTEXT

2.1 NATIONAL ENVIRONMENTAL MANAGEMENT ACT, NO. 107 OF 1997

A MMP is defined as a management plan for the maintenance purposes defined or adopted by the competent authority (CA), in the NEMA EIA Regulations of 2014, and is applicable in that certain activities that would otherwise require a formal authorisation process can be excluded on the basis of them being undertaken as part of a MMP. These activities are contained in the Listing Notices (GN R982, R983, R984 and R985) as published in the EIA Regulations.

2.2 LISTED ACTIVITIES IN TERMS OF NEMA

This MMP pertains to the repairs and maintenance of the 132 kV overhead line and associated pylon structures between the Laingsburg and Droërvier substations, in the Central Karoo District Municipality of the Western Cape Province, and is a working document for, amongst others, the following activities:

- The reconstruction of structures that include repair or improved replacement of infrastructure, **where work does not require EA** in terms of NEMA **if undertaken in accordance with an approved MMP**.
- The routine and emergency maintenance activities associated with improving the future of the infrastructure, **where work does not require EA** in terms of NEMA **if undertaken in accordance**

with an approved MMP.

Due to the nature and location of the proposed works, the EIA Regulations of 2014 pursuant to the NEMA, were consulted. The table below provides an extract of the Listing Notices and Listed Activities that were considered in the context of the periodic repair and maintenance work along the overhead line between the Laingsburg and Droërvier substations, as well as associated infrastructure.

Table 2-1: Listed Activities considered as part of the proposed repair and maintenance works of infrastructure along the four-channel valley bottom wetlands and various associated infrastructure.

Listing Notice 1 (LN 1) – GN R983 of 2014		
Activity	Description	Applicability to the proposed project
12	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or <u>(ii) infrastructure or structures with a physical footprint of 100 square metres or more;</u> where such development occurs— (a) within a watercourse; (b) in front of a development setback; or <u>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</u>	This activity will be triggered by the replacement of the four lattice towers on the 132 kV double-circuit Leeugamka – Luttig line that collapsed due to strong winds in the Leeugamka area. Additionally, two new structures will be added, and some of these pylon structures will be within 32 meters (m) of a watercourse.
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. but excluding where such infilling, depositing, dredging, excavation, removal or moving — (a) will occur behind a development setback; b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Clearance and control measures could include the infilling and depositing of materials and infrastructure within the water body and would require authorisation in terms of this activity unless authorised through an MMP process.
Listing Notice 3 (LN 3) – GN R985 of 2014		
12	The clearance of an area of 300 square metres or more of indigenous vegetation <u>except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</u> <u>i. Western Cape</u> i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; <u>ii. Within critical biodiversity areas identified in bioregional plans;</u>	Clearance and control measures could include the removal of threatened indigenous vegetation and could cumulatively across the length of the water body amount to more than 300 square metres (m²) and would require authorisation in terms of this activity unless authorised through an MMP process.

	iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning; or v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	
14	The development of— (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or <u>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</u> where such development occurs— (a) within a watercourse; (b) in front of a development setback; or <u>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</u> excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour. <u>i. Western Cape</u> <u>i. Outside urban areas:</u> (aa) A protected area identified in terms of NEMPAA, excluding conservancies; <u>(bb) National Protected Area Expansion Strategy Focus areas;</u> (cc) World Heritage Sites; (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Sites or areas listed in terms of an international convention; <u>(ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</u> (gg) Core areas in biosphere reserves; or (hh) Areas on the estuary side of the development setback line or in an estuarine functional zone where no such setback line has been determined.	This activity will be triggered by the replacement of the four lattice towers on the 132 kV double-circuit Leeugamka – Luttig line that collapsed due to strong winds in the Leeugamka area. Additionally, two new structures will be added, and some of these pylon structures will be within 32 m of a watercourse. These developments will occur in areas identified as Critical Biodiversity Areas (CBAs) and National Protected Area Expansion Strategy (NPAES) Focus Areas, as identified by the DFFE screening tool report.

Due to the natural vegetation clearance required for maintenance purposes at certain points, a terrestrial biodiversity specialist was appointed to assess the study areas. The reports are included in **Annexure C**, and the proposed mitigation measures are outlined in this MMP.

The Listed Activities relevant to the periodic maintenance and reconstruction work provide the following exclusions:

- LN 1 (19) and LN 3 (12) state that if activities are undertaken in accordance with a MMP, then an EA is not required. Adoption of this MMP will therefore satisfy the requirements of NEMA and allow Eskom to undertake the proposed activities.

Approval of this MMP will allow the relevant stakeholders to carry out the proposed reconstruction and maintenance activities without undertaking a full Basic Assessment (BA) or EIA whilst also satisfying the requirements of NEMA specifically relating to MMPs. However, for the triggered activities, such as LN 1 (12) and LN 3 (14), a BA is required to authorise these activities.

2.3 OTHER APPLICABLE ENVIRONMENTAL LEGISLATION

2.3.1 THE NATIONAL WATER ACT, NO. 36 OF 1998 (NWA)

The reconstruction and maintenance activities will constitute water uses in terms of Section 21 of the NWA. Water uses require a WUL from the DWS, unless they are, amongst other things, an existing lawful use or permissible in terms of a GA, in which case the water uses would need to be registered with DWS. The proposed activities will constitute water uses c) and i): “*disturbing the bed, bank course or characteristics of a watercourse,*” and “*impeding or diverting the flow of a watercourse*”. Both of these water uses are permissible in terms of a GA if undertaken in accordance with its conditions.

The authorisation of Section 21 c) and i) water uses, as defined in the NWA, is regulated in terms of GN 4167 of December 2023. This legislation has a specific exclusion for maintenance required by Eskom for power lines. In Appendix D2 of the notice, it is stated that certain activities qualify for a GA and do not require completion of a Risk Matrix provided the activity meets the following criteria: “**Construction of new overhead transmission and distribution power lines outside the active channel of a river and/or outside of the extend of a wetland, and minor maintenance of roads, river crossings, towers and substations where footprint will remain the same. The maintenance or replacement of existing overhead and underground cables where it is done in terms of the Emergency Protocol. However, new underground cables and underground and overhead cables within the extent of a wetland must be subjected to the Risk Matix and therefore excluded from this appendix**”.

It is therefore anticipated that no Risk Matrix will be necessary for this assessment and that the applicant (Eskom) will be able to apply for the Section 21 c) and i) water uses under a GA. Confluent Environmental (Pty) Ltd was appointed as the freshwater specialists to undertake a detailed site and risk assessment.

3 DATA COLLECTION AND ASSESSMENT

3.1 CLIMATE AND RAINFALL

Rainfall in this region primarily occurs during autumn and summer, with a notable peak in March and minimal cyclonic rain in winter. It lies in the rain shadow of the Cape Fold Belt mountains to the south, with mean annual precipitation (MAP) ranging from about 100 mm in some areas between the Dwyka and Gamka Rivers to approximately 240 mm near the Great Escarpment. In Beaufort West, the mean maximum and minimum monthly temperatures are 38.7°C in January and –3.2°C in July, respectively. Additionally, strong north-westerly winds are prevalent in winter (SANBI 2018).

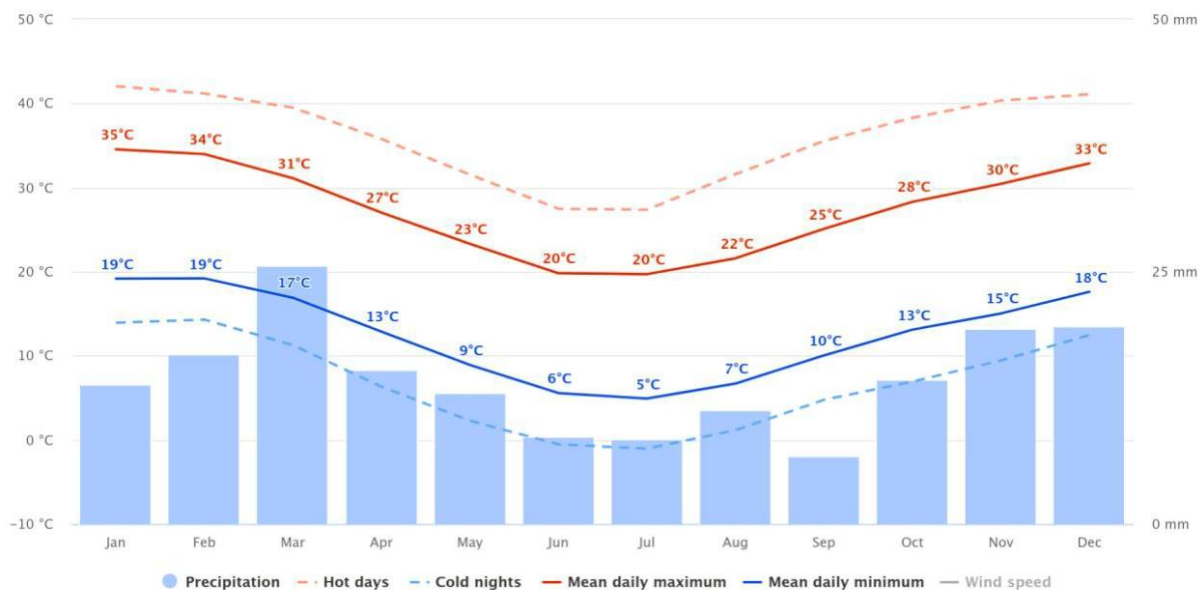


Figure 3-1: Monthly average temperatures and rainfall for Leeu Gamka (meteoblue).

According to the wind rose for Leeu Gamka, the predominant wind direction is from the southeast, which is also where the strongest winds originate (see **Figure 3-2**).

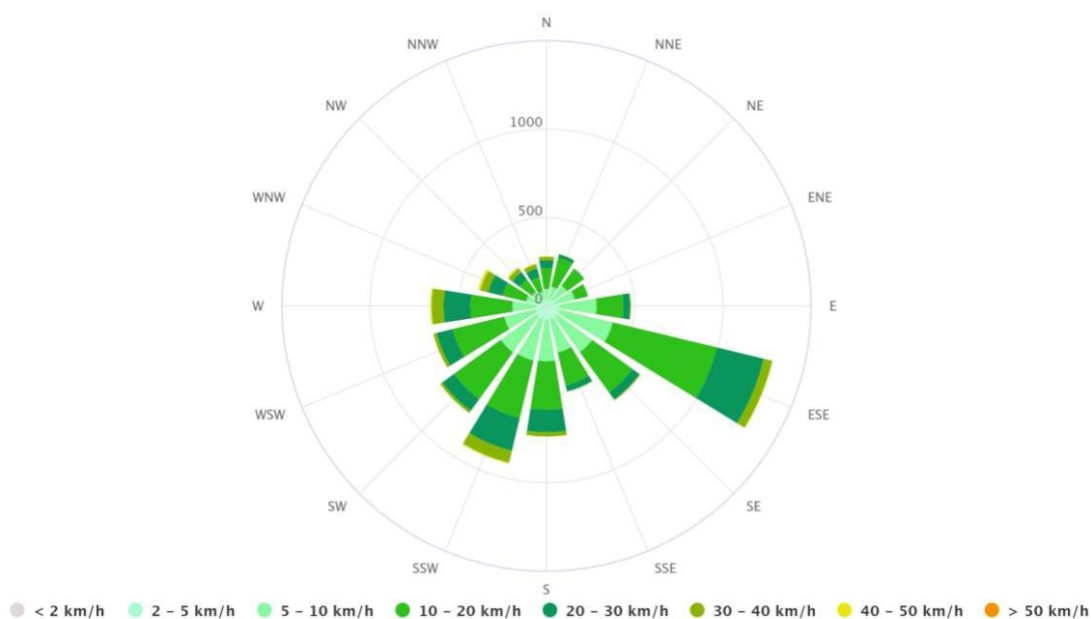


Figure 3-2: Wind rose for Leeu Gamka showing how many hours per year the wind blows from the indicated direction and predominantly at what speeds (meteoblue).

3.2 VEGETATION

The study area is located in the Nama Karoo and Succulent Karoo biomes (Mucina & Rutherford, 2006). The Nama-Karoo is a large, landlocked region on the central plateau of the western half of South Africa and extends into southeastern Namibia. The name is derived from the Khoi San word *kuru* meaning 'dry'. It covers an area of 248 284 km². The climate of the Nama-Karoo is essentially continental and is little affected by the ameliorating influences of the oceans. The Nama-Karoo is an arid biome.

The Succulent Karoo is also an arid biome, it is in fact the only international biodiversity hotspot which is entirely in an arid region (Mucina & Rutherford, 2006).

The power line traverses the Koedoesberge-Moordenaars Karoo, Gamka Karoo, Southern Karoo Riviere and the Upper Karoo Hardeveld vegetation units, with the majority of the power line being in the Gamka Karoo vegetation unit (refer to **Figure 3-3**). None of the mapped vegetation types are considered threatened ecosystem types according to GN 4727 of 2022, the Revised National List of Ecosystems that are Threatened and in Need of Protection.

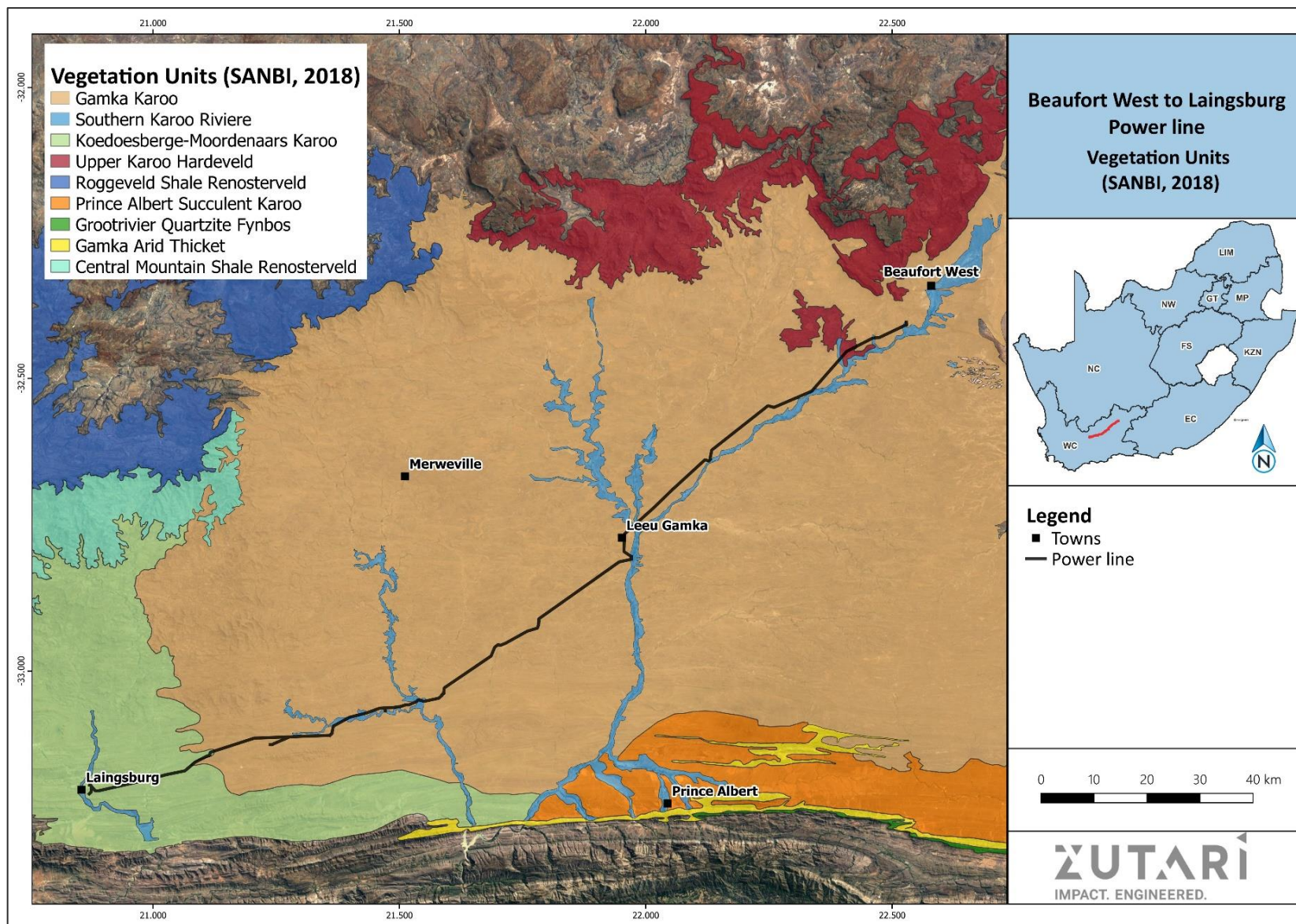


Figure 3-3: Vegetation Map (Excellence Ecology, 2024)

3.2.1 GAMKA KAROO

The Gamka Karoo unit covers vast open plains with some hills. Soil is shallow and rocky. Vegetation is dominated by small shrubs and forbs (refer to **Figure 3-4**). Dominant species include the shrubs *Rhigozum obovatum* (Karoo gold, *geelgranaat*), *Lycium spp.*, the grasses *Stipagrostis ciliata*, *S. obtusa*, *Enneapogon spp.* and *Aristida spp.* and the forbs *Arctotis adpressa*, *Felicia namaquana*, *F. ovata*, *Galenia sarcophylla*, *Ifloga glomerata*, *Pentzia spp.*, *Ursinia nana* and a variety of *mesembs*.

Much of this unit is disturbed, as there are service roads under the power lines. Some areas are overgrazed, although most is in a relatively good condition (next to the service roads). The sensitivity of **medium-low** was given to this unit.



Figure 3-4: Gamka Karoo (Excellence Ecology, 2024)



Figure 3-5: Great Karoo (Excellence Ecology, 2024)

3.2.2 KOEDOESBERG-MOORDENAARS KAROO

The Koedoeberge-Moordenaars Karoo is part of the Succulent Karoo Biome which generally has a higher species diversity than the Nama Karoo. There are more succulents in this unit than in the other vegetation units of which some are provincially protected. The soil is generally shallow and rocky and most of it is located on mountain slopes. Dominant species includes the shrubs *Lycium spp.*, *Rhigozum obovatum*, *Ruschia intricata* and other *mesembs*, the grasses *Stipagrostis ciliata*, *S. obtusa*, *Enneapogon spp.* and *Aristida spp.* and forbs and succulents such as *Anacampseros spp.*, *Crassula spp.* and *Sericocoma avolans*. See Appendix B of the Terrestrial Biodiversity report for the list of recorded species.

This vegetation unit is generally in a good condition and a sensitivity of **medium** was assigned to it.



Figure 3-6: Koedoesberge-Moordenaars Karoo (Excellence Ecology, 2024)



Figure 3-7: *Pelargonium crithmifolium* (Excellence Ecology, 2024)

3.2.3 RIPARIAN AREAS

This vegetation unit is embedded within the Koedoesberge-Moordenaars Karoo, and Gamka Karoo vegetation units. They are mostly non-perennial drainage lines, characterised by sandy soils with the exception of a few perennial rivers. The sand is often rich in salt. Vegetation is clearly different from the surrounding vegetation, including tree species such as *Vachellia karroo* (Sweet thorn), *Tamarix usneoides* (Wild Tamarisk) and *Salsola aphylla* (Lye Ganna), *Nidorella ivifolia* (Oven bush). The grass *Stipagrostis namaquensis* (River bushman grass) is found exclusively in this vegetation unit. No plant Species of conservation concern (SCC) were recorded in this unit. It may provide suitable habitat for the Critically Endangered Riverine Rabbit (*Bunolagus monticularis*) although none were recorded.



Figure 3-8: Koekemoers River north of Leeu Gamka (Excellence Ecology, 2024)



Figure 3-9: Dry drainage line (Excellence Ecology, 2024)

3.2.4 UPPER KAROO HARDEVELD

A small section of the power line not far from Beaufort West traverses the Upper Karoo Hardeveld vegetation unit. It typically occurs on steep slopes and has shallow rocky soils. Vegetation consists of sparse dwarf Karoo scrub with drought-tolerant grasses of genera such as *Aristida*, *Eragrostis* and *Stipagrostis*. Dominant shrubs include *Lycium cinereum* and *Rhigozum obovatum*.

3.3 PLANT SPECIES

This section lists the protected and endemic species recorded in the project area. SCC identified by the DFFE screening tool report are also included, along with a list of declared invaders.

3.3.1 PROTECTED AND ENDEMIC SPECIES

A list of protected and endemic plant species recorded in the project area is provided, while a complete list of recorded plant species can be found in Appendix B of the Terrestrial Biodiversity report. No national Red List species were recorded.

Table 3-1: Provincially protected species (Nature Conservation Ordinance No. 19 of 1974)

Provincially protected plant species		
Family	Scientific name	Common name
<i>Asphodelaceae</i>	<i>Aloe claviflora</i>	Kanonaalwyn
<i>Asphodelaceae</i>	<i>Aloe microstigma</i>	Karoo Aalwyn

<i>Anacampserotaceae</i>	<i>Anacampseros albidiflora</i>	Haasballetjies
<i>Anacampserotaceae</i>	<i>Anacampseros ustulata</i>	Kirriemoer
<i>Iridaceae</i>	<i>Babiana bainesii</i>	Bobbejaanuintjie
<i>Crassulaceae</i>	<i>Crassula pyramidalis</i>	Rygbossie
<i>Asphodelaceae</i>	<i>Haworthia arachnoidea</i>	Spinnekopbolletjie
<i>Asphodelaceae</i>	<i>Haworthiopsis viscosa</i>	Koedoekos
<i>Iridaceae</i>	<i>Moraea collina</i>	Aasuintjie

Table 3-2: Endemic species

Trees and shrubs		
Scientific name	Common name	Status
<i>Asparagus aethiopicus</i>	Haakdoring	Least concern, Endemic (SA)
<i>Asparagus burchellii</i>	Wild Asparagus	Least concern, Endemic (SA)
<i>Asparagus mucronatus</i>	Katdoring	Least concern, Endemic (SA)
<i>Asparagus striatus</i>	Bergappel	Least concern, Endemic (SA)
<i>Berkheya spinosa</i>	Perdebos	Least concern, Endemic (SA)
<i>Ehretia rigida</i>	Puzzle bush	Least concern, Endemic (SA)
<i>Grewia robusta</i>	Karoo Cross-berry	Least concern, Endemic (SA)
<i>Macleodium spinosum</i>	Steekblom	Least concern, Endemic (SA)
<i>Oedera oppositifolia</i>	Blouperdekaroo	Least concern, Endemic (SA)
<i>Pteronia glomerata</i>	Perdebossie	Least concern, Endemic (SA)
<i>Ruschia intricata</i>	Doringvygie	Least concern, Endemic (SA)
<i>Salsola calluna</i>	Rooilootganna	Least concern, Endemic (SA)
Forbs		
Scientific name	Common name	Status
<i>Adromischus maculatus</i>	Bontplakkie	Least concern, Endemic (SA)
<i>Aloe microstigma</i>	Karoo Aalwyn	Least concern, Endemic (SA)
<i>Anacampseros ustulata</i>	Kirriemoer	Least concern, Endemic (SA)
<i>Antimima evoluta</i>		Least concern, Endemic (SA)
<i>Antimima maxwellii</i>		Least concern, Endemic (SA)
<i>Aptosimum indivisum</i>	Karoo Violet	Least concern, Endemic (SA)
<i>Arctotis adpressa</i>	Gousblom	Least concern, Endemic (SA)
<i>Crassula montana</i>		Least concern, Endemic (SA)
<i>Crassula pyramidalis</i>	Rygbossie	Least concern, Endemic (SA)
<i>Crassula rupestris</i>	Concertina Plant	Least concern, Endemic (SA)
<i>Drosanthemum archeri</i>		Least concern, Endemic (SA)
<i>Euphorbia decepta</i>	Melkpol	Least concern, Endemic (SA)
<i>Felicia ovata</i>	Grootbloublommetjie	Least concern, Endemic (SA)
<i>Garuleum bipinnatum</i>	Slanghoutjie	Least concern, Endemic (SA)
<i>Haworthia arachnoidea</i>	Spinnekopbolletjie	Least concern, Endemic (SA)
<i>Hermannia althaeifolia</i>	Bokkiesblom	Least concern, Endemic (SA)
<i>Malephora uitenhagensis</i>		Least concern, Endemic (SA)
<i>Massonia depressa</i>	Suikerkannetjie	Least concern, Endemic (SA)
<i>Moraea collina</i>	Aasuintjie	Least concern, Endemic (SA)
<i>Osteospermum sinuatum</i>	Bietou	Least concern, Endemic (SA)
<i>Pleiospilos compactus</i>	Kwaggavy	Least concern, Endemic (SA)

<i>Quaqua ramosa</i>	Ramshoringghaap	Least concern, Endemic (SA)
<i>Trichodiadema setuliferum</i>	Hairy Nipple Vygie, stervygie	Least concern, Endemic (SA)
<i>Zaluzianskya violacea</i>	Drumsticks	Least concern, Endemic (SA)

3.3.2 PROTECTED TREES

No protected trees were recorded in the project area or the surrounding.

3.3.3 EIA SCREENING TOOL LISTED SPECIES (SCC)

The screening tool listed the following plant SCC for the project area:

Table 3-3: Screening Tool plant SCC

Protected Plants according to Screening tool			
Scientific name	Common name	Status	Habitat
<i>Cotyledon tomentosa</i> subsp. <i>tomentosa</i>	Bear's Paw	Endangered	It grows in arid thicket, on lower, gravelly slopes in sheltered ravines.
<i>Eriocephalus grandiflorus</i>	Kapokbos	Rare	Lower foothills in quartz patches.
<i>Peersia frithii</i>		Vulnerable	It occurs on slopes or flats of finely weathered Ecca shales.
<i>Tritonia florentiae</i>		Rare	It occurs in a variety of vegetation types on gravel flats in washes and drainage lines, flowering in winter and responding rapidly to early winter rains that fall erratically.

Table 3-4: Sensitive plant SCC given in the screening Tool

Sensitive species 1041
Sensitive species 1212
Sensitive species 208
Sensitive species 507
Sensitive species 727

Note: The names of these species may not be given in this report, as they are sensitive to poaching. None of these species were recorded but some of them may be present.

3.3.4 DECLARED INVADERS

The following four alien invader plant species were recorded in the project area and must be controlled:

Table 3-5: Declared invader plant species recorded in the project area.

Declared invaders in the project area		
Scientific name	Common name	Invader category
<i>Argemone ochroleuca</i>	White-flowered Mexican poppy	1b
<i>Prosopis glandulosa</i>	Honey Mesquite	1b
<i>Salsola kali</i>	Prickly Glasswort / Tolbossie	1b
<i>Tephrocactus articulatus</i>	Pine cone cactus	1a

The Freshwater Aquatic specialist has identified alien vegetation in a small area along the Bloed River, observing only two species during the site visit: one individual *Prosopis* sp. tree (Mesquite) and *Arundo donax* (Spanish reed).

Category 1 plants are prohibited plants which must be controlled or eradicated. These plants serve no economic purpose and possess characteristics that are harmful to humans, animals or the environment.

Category 1a: Plants are high-priority emerging species requiring compulsory control. All breeding, growing, moving and selling are banned

Category 1b: Plants are widespread invasive species controlled by a management program.

Category 2 plants are invaders with certain useful qualities, such as commercial use or for woodlots, animal fodder, soil stabilisation, etc. These plants are allowed in demarcated areas under controlled conditions and in biocontrol reserves.

Category 3 plants are alien plants that are currently growing in, or have escaped from areas such as gardens, but that are proven invaders. No further planting is allowed (except with special permission), nor trade in propagative material. Existing plant may remain but must be prevented from spreading. Plants within the flood line and watercourses must be removed (Bromilow, 2010).

3.4 FAUNA

3.4.1 FAUNA SPECIES OF CONSERVATION CONCERN

SCC are listed if they have been recorded in the relevant quarter degree grid on the Virtual Museum of Biodiversity and Development Institute (Virtual Museum, 2022) and if they were flagged by the DFFE screening tool report for the project area. The screening tool species are highlighted in orange. Only SCC are included in this section (**Table 3-6** to **Table 3-9**). For a complete list of species recorded in the quarter degree grid, please see Appendix B of the Terrestrial Biodiversity report.

Red list categories are as follows:

CR: Critically Endangered, indicating that the species is facing an extremely high risk of extinction.

EN: Endangered, indicating that the species is facing a very high risk of extinction.

VU: Vulnerable, indicating that the species is facing a high risk of extinction.

NT: Near Threatened, is likely to become at risk of extinction in the near future.

Declining: A species is Declining when there are threatening processes causing a continuing decline of the species.

LC: Least Concern Species are considered at low risk of extinction. Widespread and abundant species are typically classified in this category.

Table 3-6: Mammal species of conservation concern that may be present (Screening Tool (in orange) and Virtual Museum)

Mammal species of conservation concern			
Family	Scientific name	Common name	Red list category
<i>Bovidae</i>	<i>Damaliscus pygargus pygargus</i>	Bontebok	VU (regional), NT (global)
<i>Bovidae</i>	<i>Hippotragus equinus</i>	Roan Antelope	EN (regional), LC (global)
<i>Bovidae</i>	<i>Hippotragus niger niger</i>	Sable Antelope	VU (regional), LC (global)
<i>Bovidae</i>	<i>Pelea capreolus</i>	Vaal Rhebok	NT (regional), NT (global)
<i>Elephantidae</i>	<i>Loxodonta africana</i>	African Bush Elephant	LC (regional), VU A2a (global)
<i>Equidae</i>	<i>Equus quagga</i>	Plains Zebra	LC (regional), NT (global)
<i>Felidae</i>	<i>Felis nigripes</i>	Black-footed Cat	VU (regional), VU (global)
<i>Felidae</i>	<i>Panthera pardus</i>	Leopard	VU (regional), VU (global)
<i>Hyaenidae</i>	<i>Crocuta crocuta</i>	Spotted Hyaena	NT (regional), LC (global)
<i>Hyaenidae</i>	<i>Hyaena brunnea</i>	Brown Hyena	NT (regional), NT (global)
<i>Leporidae</i>	<i>Bunolagus monticularis</i>	Riverine Rabbit	CR (regional), CR (global)

Mammal species of conservation concern			
Family	Scientific name	Common name	Red list category
<i>Muridae</i>	<i>Parotomys littledalei</i>	Littledale's Whistling Rat	NT (regional), LC (global)
<i>Mustelidae</i>	<i>Aonyx capensis</i>	African Clawless Otter	NT (regional), NT (global)

Table 3-7: Bird species of conservation concern that may be present (Screening Tool (in orange) and Virtual Museum)

Bird species of conservation concern			
Family	Scientific name	Common name	Red list category
<i>Accipitridae</i>	<i>Aquila verreauxii</i>	Verreaux's (Black) Eagle	Global: LC; BLSA: VU
<i>Accipitridae</i>	<i>Circus maurus</i>	Black Harrier	Global: VU; BLSA: EN
<i>Accipitridae</i>	<i>Polemaetus bellicosus</i>	Martial Eagle	Global: VU; BLSA: EN
<i>Ciconiidae</i>	<i>Ciconia nigra</i>	Black Stork	Global: LC; BLSA: VU
<i>Falconidae</i>	<i>Falco biarmicus</i>	Lanner Falcon	Global: LC; BLSA: VU
<i>Motacillidae</i>	<i>Anthus crenatus</i>	African Rock Pipit	Global: LC; BLSA: NT
<i>Otididae</i>	<i>Afrotis afra</i>	Southern Black Korhaan	Global: LC; BLSA: VU
<i>Otididae</i>	<i>Ardeotis kori</i>	Kori Bustard	Global: NT; BLSA: NT
<i>Otididae</i>	<i>Eupodotis vigorsii</i>	Karoo Korhaan	Global: LC; BLSA: NT
<i>Otididae</i>	<i>Neotis ludwigii</i>	Ludwig's Bustard	Global: EN; BLSA: EN
<i>Sagittariidae</i>	<i>Sagittarius serpentarius</i>	Secretarybird	Global: VU; BLSA: VU

Table 3-8: Reptile species of conservation concern that may be present (Screening Tool (in orange) and Virtual Museum)

Reptile species of conservation concern			
Family	Scientific name	Common name	Red list category
<i>Gekkonidae</i>	<i>Goggia braacki</i>	Braack's Pygmy Gecko	Near Threatened (SARCA 2014)
<i>Testudinidae</i>	<i>Chersobius boulengeri</i>	Karoo Padloper	Near Threatened (SARCA 2014)

Table 3-9: Frog species of conservation concern that may be present (Virtual Museum)

Frog species of conservation concern			
Family	Scientific name	Common name	Red list category
<i>Pyxicephalidae</i>	<i>Pyxicephalus adspersus</i>	Giant Bull Frog	Near Threatened

3.4.2 FAUNA HABITAT TYPES

The power line spans several habitat types. Most of the project area consists of Karoo veld, which is characterised by small shrubs and forbs, some grass and almost no trees. Trees can be found in the riparian areas. Some bird species, such as Martial Eagles make use of power pylons for breeding, especially where trees are not available.

Ludwig's Bustard occurs in the flat, open, semi-arid shrublands of the Succulent Karoo, Nama Karoo and Namib. The project area is thus perfect for it.

Some species, such as Verreaux's Eagle and Lanner Falcons, prefer rocky outcrops and cliffs for breeding. There are several cliffs in the area.

Rocky areas create suitable habitat for many reptile species. Frogs are to some extent bound to riparian areas, as most of them need water to reproduce.

The Critically endangered riverine rabbit inhabits dense riparian growth along the seasonal rivers in the central Karoo (Nama-Karoo shrubland). Specifically, it occurs in riverine vegetation on alluvial soils adjacent to seasonal rivers.

No fauna species of conservation concern were recorded in the project area, but there is suitable habitat for several SCC species and there are likely some SCC present. Care should be taken not to disturb or kill them during any maintenance operations.

3.5 BIODIVERSITY CONSERVATION IMPORTANCE

According to the DFFE screening tool report, the site has the following sensitivities:

- Aquatic Biodiversity: Very High Sensitivity (**Figure 3-10**)
- Terrestrial Biodiversity: Very High Sensitivity (**Figure 3-11**).
- Animal Species Theme: High Sensitivity (**Figure 3-12**).
- Plant Species Theme: Medium Sensitivity (**Figure 3-13**).

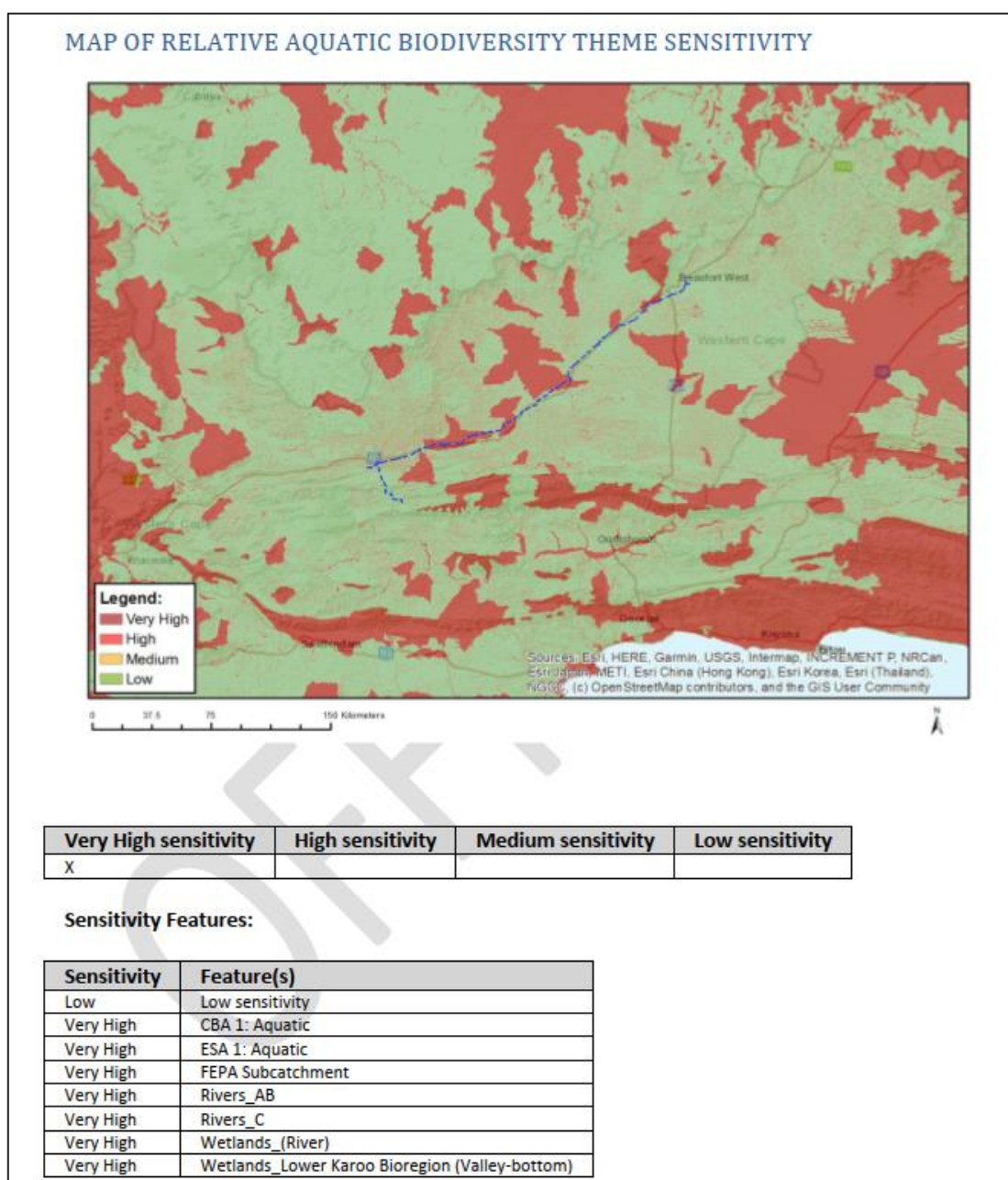
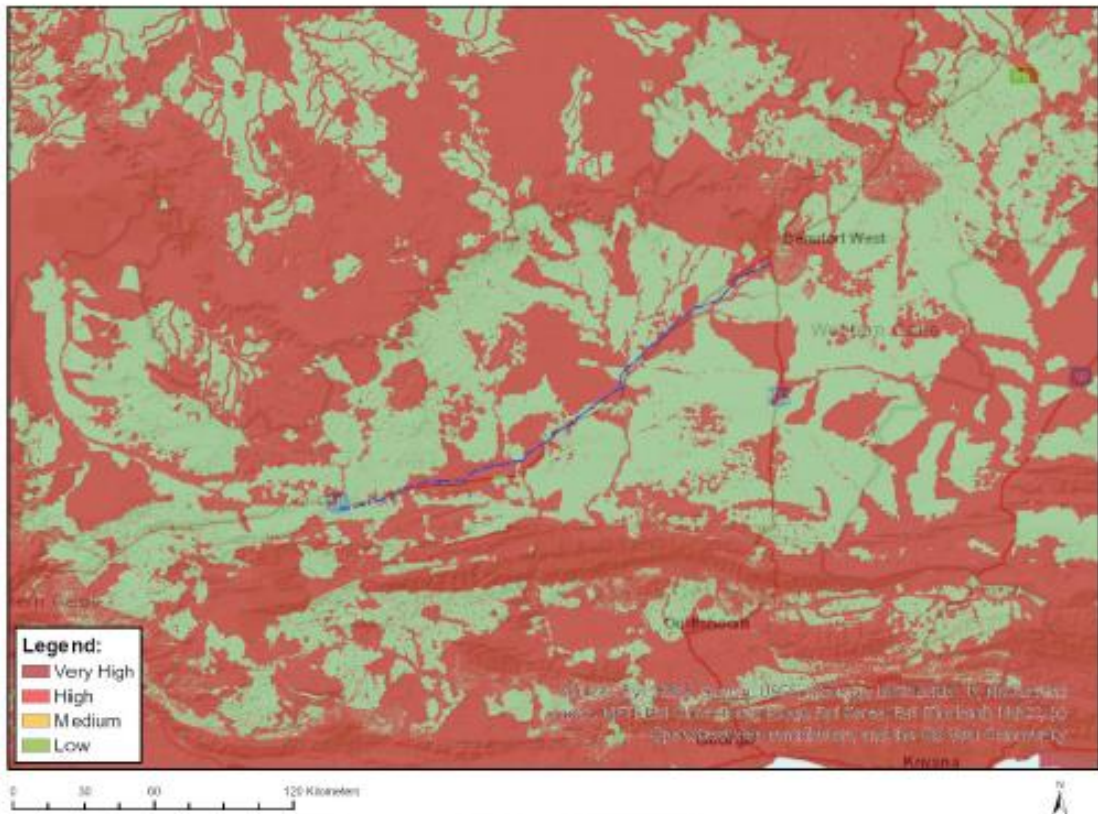


Figure 3-10: Aquatic biodiversity theme sensitivity according to the Screening Tool

MAP OF RELATIVE TERRESTRIAL BIODIVERSITY THEME SENSITIVITY



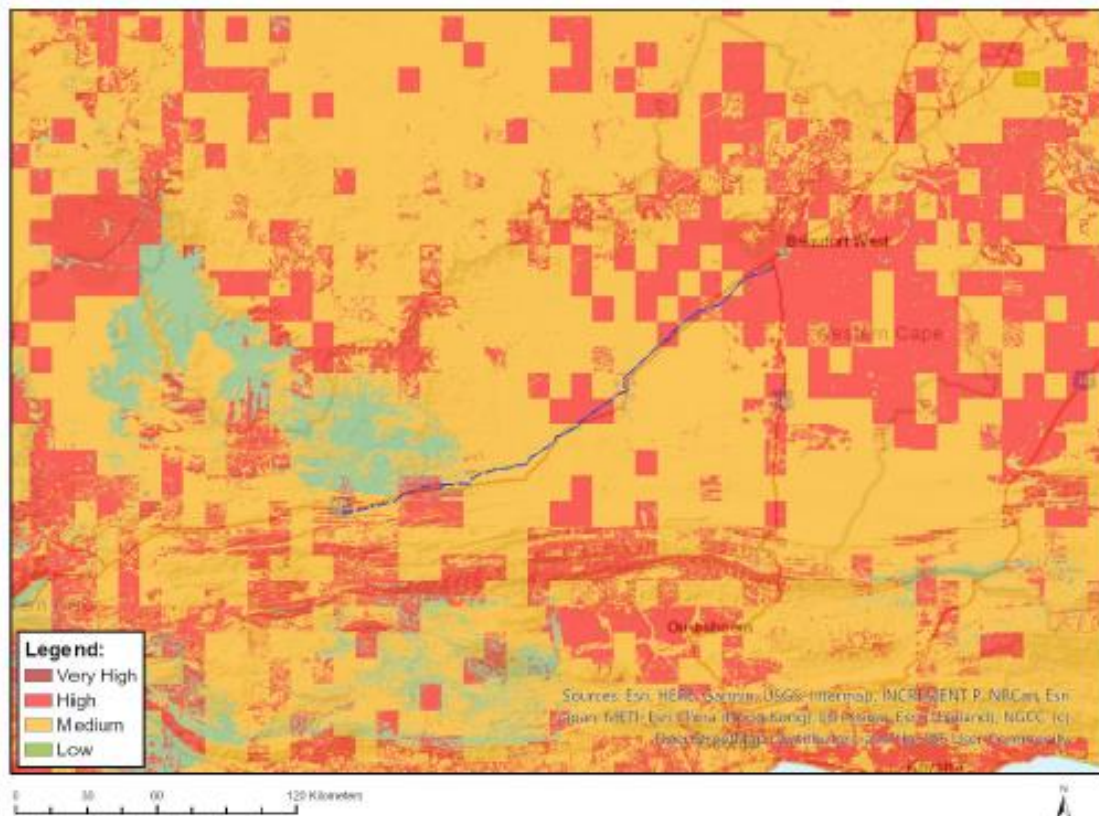
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
X			

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Very High	ESA 2: Restore from other land use
Very High	CBA 2: Terrestrial
Very High	CBA 1: Terrestrial
Very High	FEPA Subcatchment
Very High	National Protected Area Expansion Strategy (NPAES)

Figure 3-11: Terrestrial biodiversity theme sensitivity according to the Screening Tool

MAP OF RELATIVE ANIMAL SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

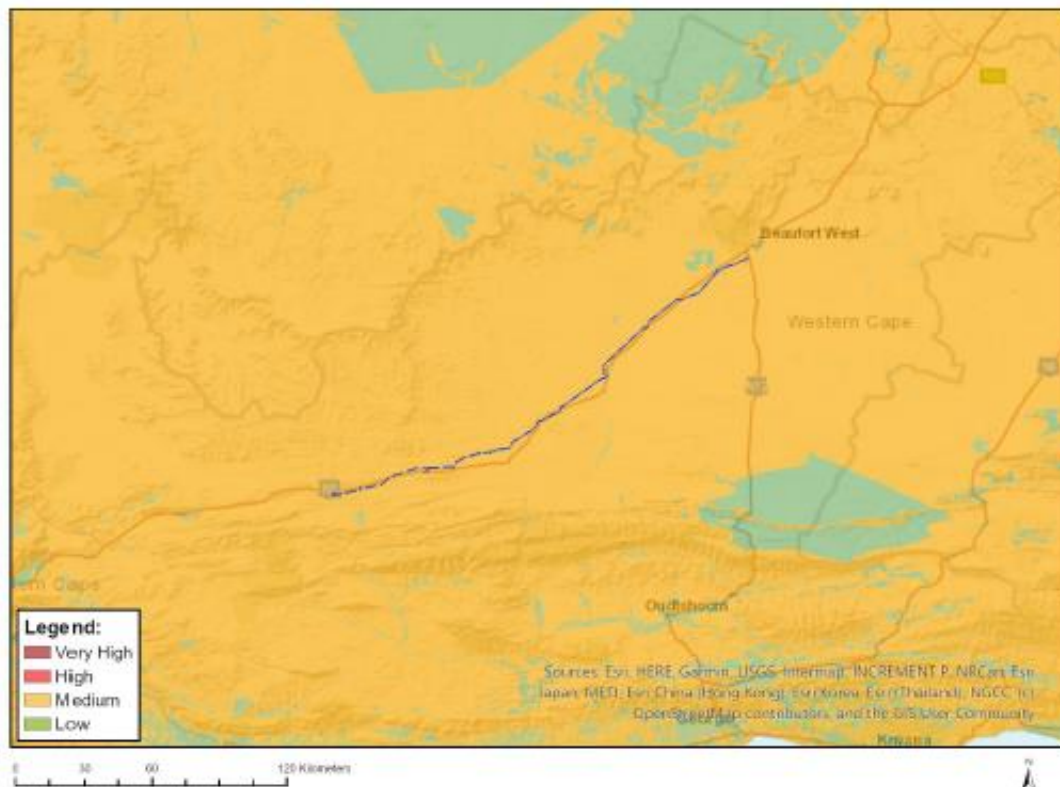
Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	X		

Sensitivity Features:

Sensitivity	Feature(s)
High	Aves-Falco biarmicus
High	Aves-Polemaetus bellicosus
High	Aves-Aquila verreauxii
High	Aves-Neotis ludwigii
Low	Subject to confirmation
Medium	Aves-Afrotis afra
Medium	Aves-Neotis ludwigii
Medium	Aves-Sagittarius serpentarius
Medium	Aves-Aquila verreauxii
Medium	Mammalia-Bunolagus monticularis
Medium	Reptilia-Chersobius boulengeri

Figure 3-12: Animal species theme sensitivity according to the Screening Tool

MAP OF RELATIVE PLANT SPECIES THEME SENSITIVITY



Where only a sensitive plant unique number or sensitive animal unique number is provided in the screening report and an assessment is required, the environmental assessment practitioner (EAP) or specialist is required to email SANBI at eiadatarequests@sanbi.org.za listing all sensitive species with their unique identifiers for which information is required. The name has been withheld as the species may be prone to illegal harvesting and must be protected. SANBI will release the actual species name after the details of the EAP or specialist have been documented.

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		X	

Sensitivity Features:

Sensitivity	Feature(s)
Low	Low Sensitivity
Medium	Sensitive species 1041
Medium	Sensitive species 507
Medium	Sensitive species 727
Medium	Sensitive species 208
Medium	Peersia frithii
Medium	Sensitive species 1212
Medium	Tritonia florentiae
Medium	Eriocephalus grandiflorus
Medium	Cotyledon tomentosa subsp. tomentosa

Figure 3-13: Plant species theme sensitivity according to the Screening Tool

3.5.1 CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS

There are several CBAs and Ecological Support Areas (ESAs) in the project area. The power line traverses multiple CBA1 areas, as identified by the Western Cape Biodiversity Spatial Plan (WCBSP);

2017), as well as some ESA1 areas. The remainder consists of ‘Other Natural Areas’ (see **Figure 3-14** to **Figure 3-16**) (Cape Nature, 2017).

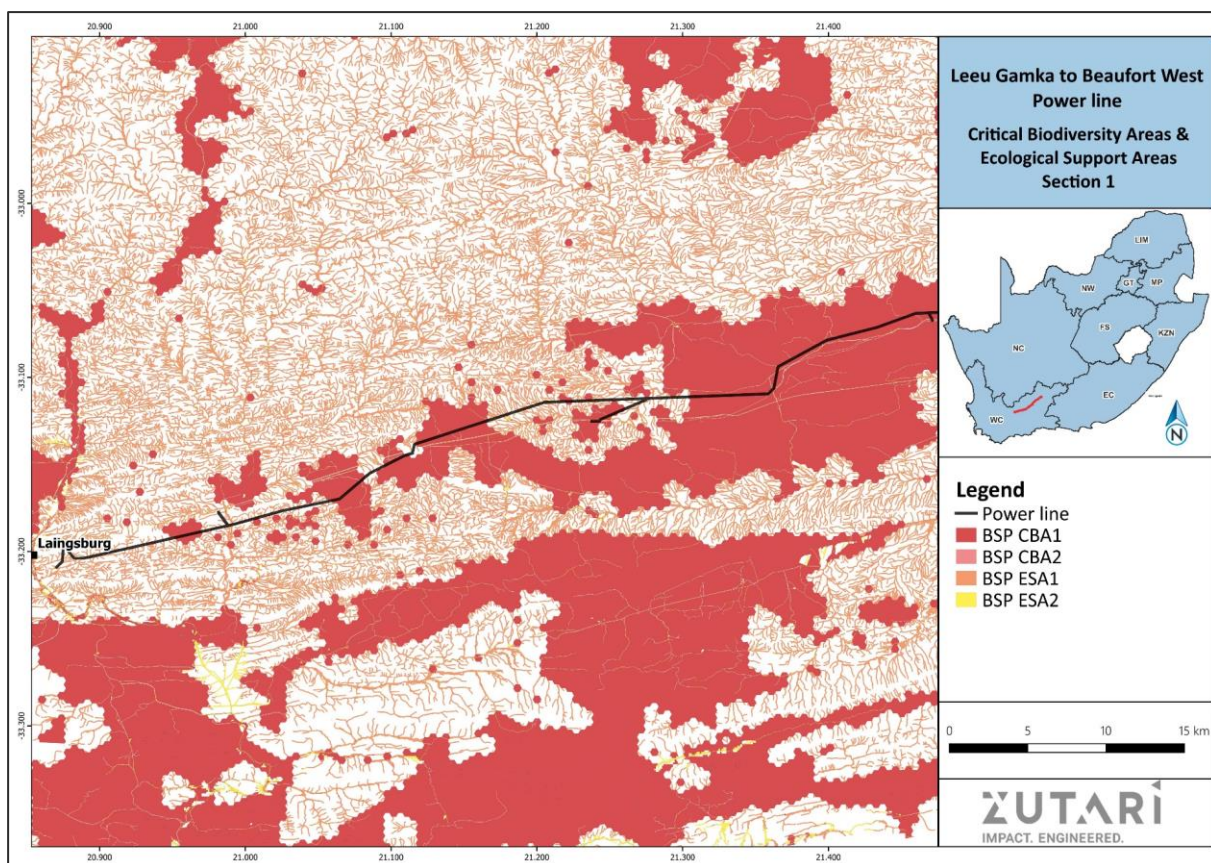


Figure 3-14: CBAs Map Section 1 (Excellence Ecology, 2024)

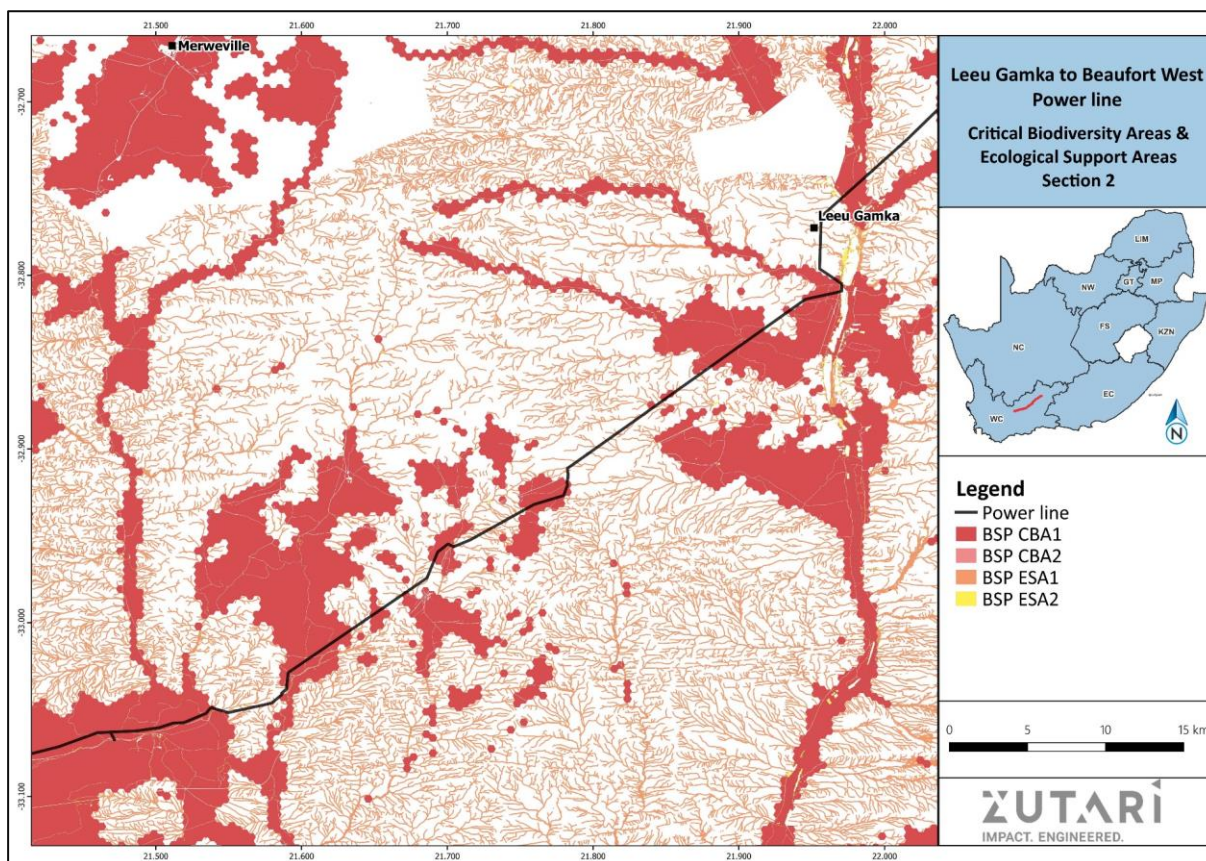


Figure 3-15: CBAs Map Section 2 (Excellence Ecology, 2024)

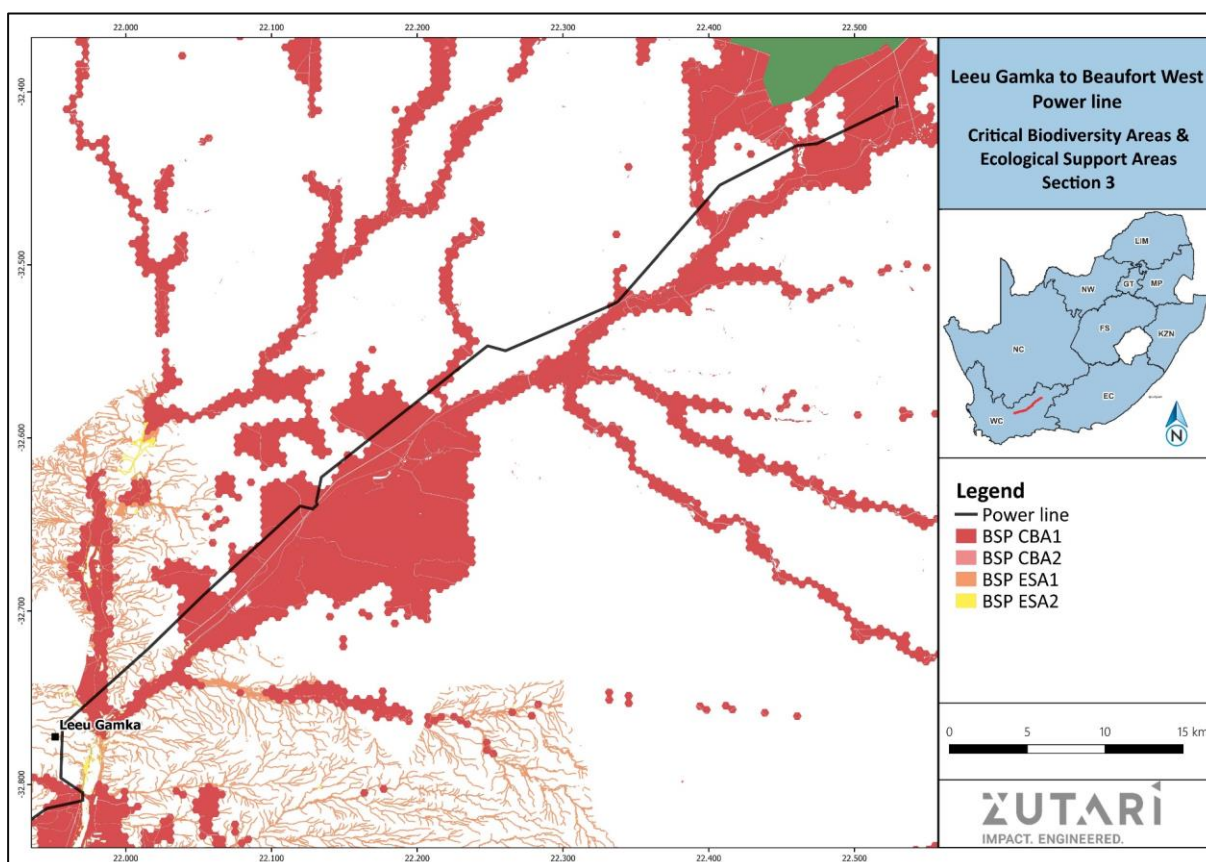


Figure 3-16: CBAs Map Section 3 (Excellence Ecology, 2024)

3.5.2 IMPORTANT BIRD AREAS (KEY BIODIVERSITY AREAS)

The project area does not traverse any Important Bird Areas (IBAs). The nearest IBA is Karoo National Park, located approximately 3 km north of the eastern section of the power line (see **Figure 3-17**).

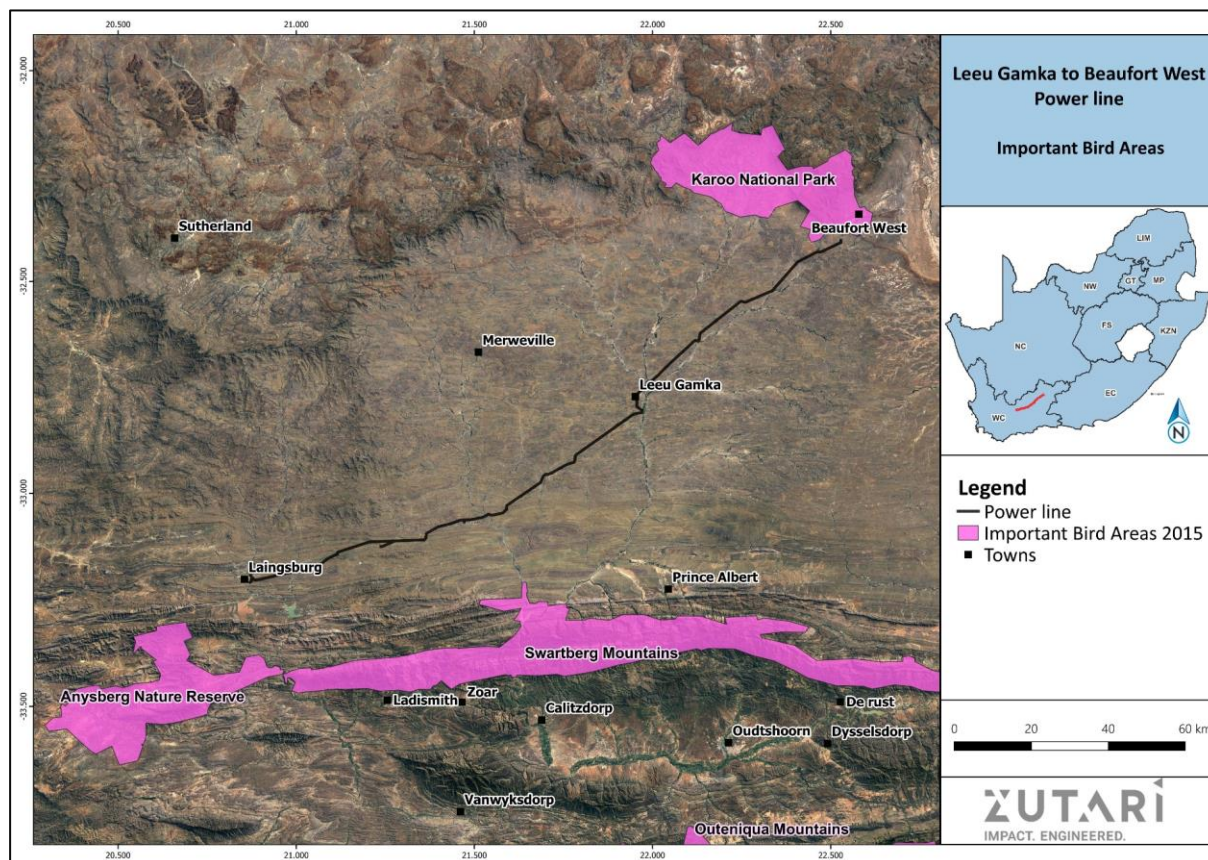


Figure 3-17: Important Bird Areas (Excellence Ecology, 2024)

3.5.3 PROTECTED AREAS AND NATIONAL PROTECTED AREA EXPANSION STRATEGY (NPAES)

The power line does not traverse any National Protected Areas (PAs), but the Karoo National Park is 3 km north of the power line, close to Beaufort West and the Henry Kruger Private Nature Reserve is 1 km north of the power line at Leeu Gamka. The power line traverse one NPAES Focus Areas (**Figure 3-18**).

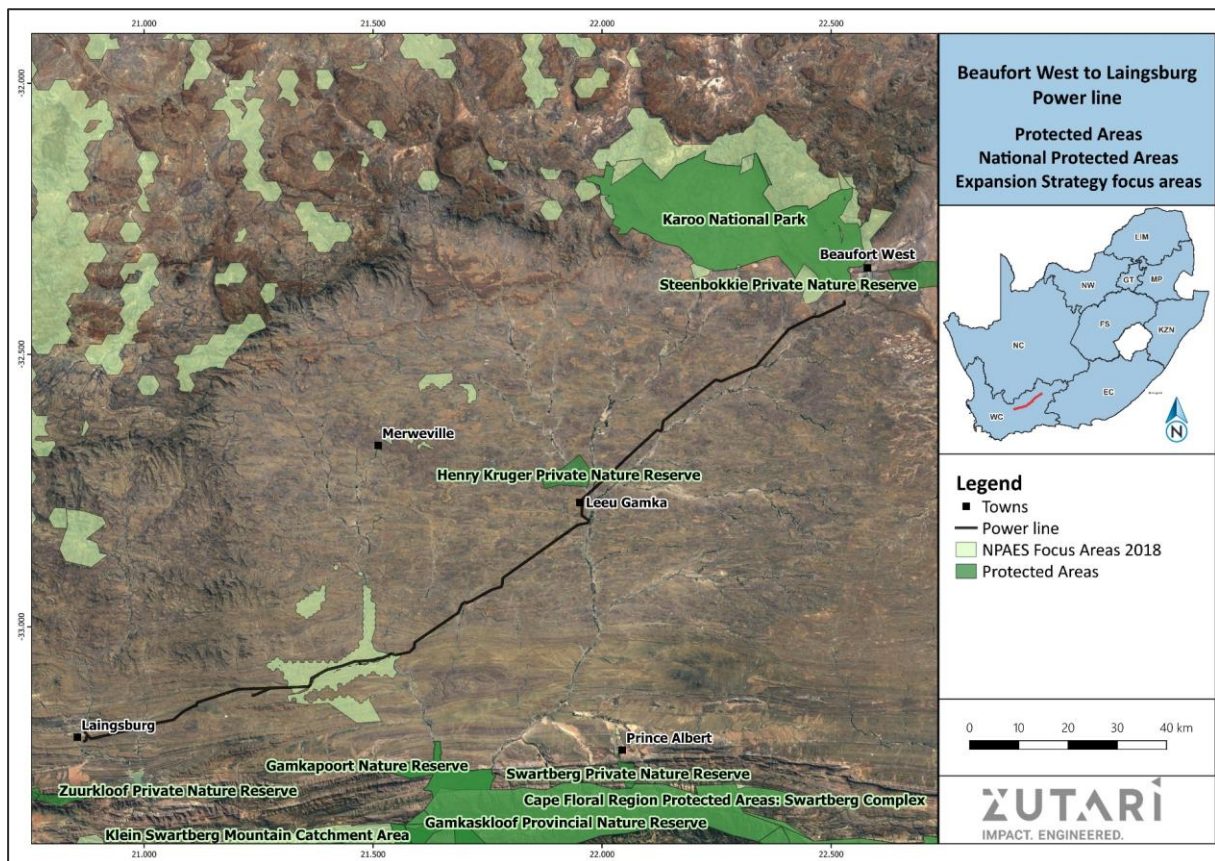


Figure 3-18: Protected Areas and Protected Areas Expansion Strategy Focus Areas (Excellence Ecology, 2024)

3.5.4 NATIONALLY THREATENED ECOSYSTEMS

The project area is not located in or near a Red List of Ecosystems (RLE) / Threatened Ecosystem (Figure 3-19).

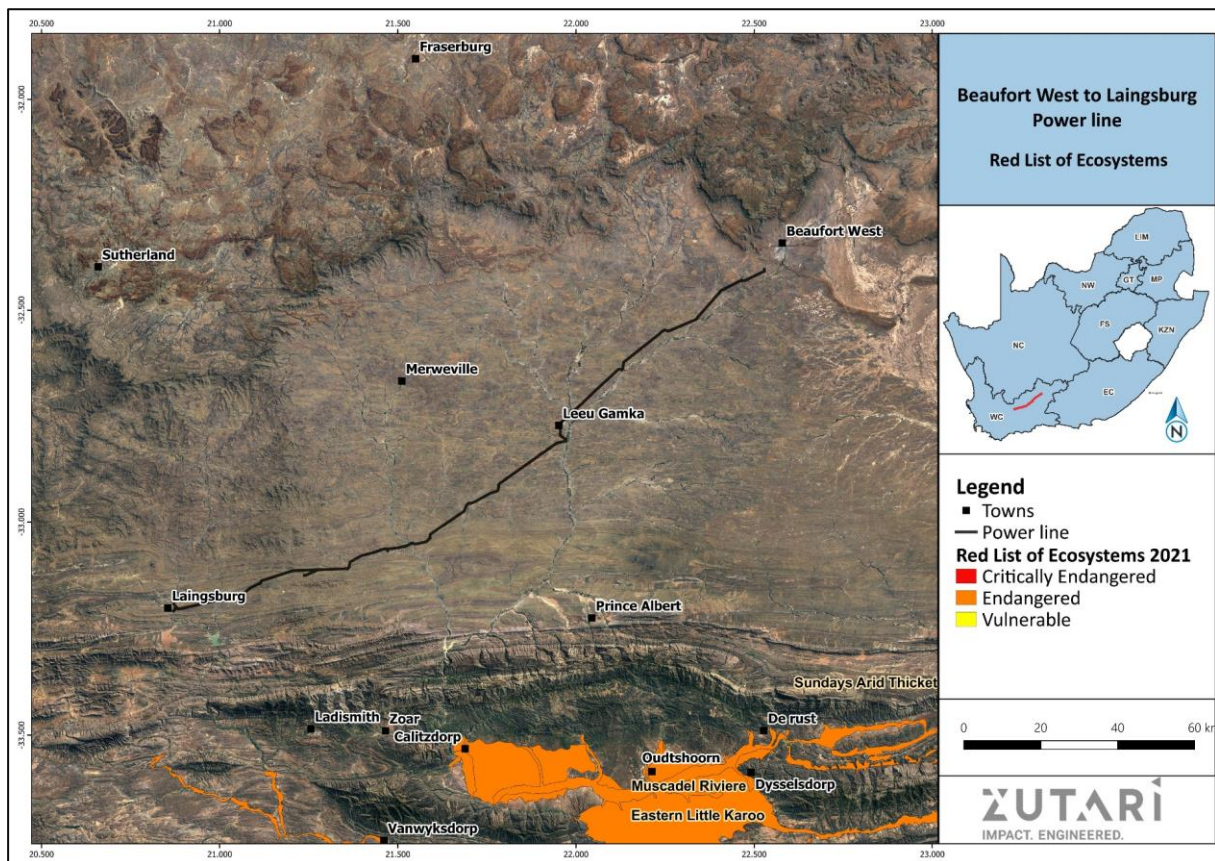


Figure 3-19: Threatened Ecosystems / Red List of Ecosystems 2021 (Excellence Ecology, 2024)

3.6 TERRESTRIAL BIODIVERSITY IMPACT ASSESSMENT (EXCELLENCE ECOLOGY, 2024)

Most of the power line is far from roads and the disturbance of vegetation is inevitable. If pylons have to be replaced, groundworks will disturb the soil and vegetation, which in turn may lead to soil erosion and the increase of invasive plant species. The power line in itself is a hazard for some bird species, as they may collide with it. Potential impacts that may be caused by the power line and maintenance thereof is discussed in the section below, with recommended mitigation measures.

3.6.1 COLLISION OF BIRDS WITH POWER LINES

Impact

Mortality of birds due to collision with power lines is a serious problem worldwide. This is especially the case with bigger birds as they are clumsy with low manoeuvrability. Bustards are amongst the worst hit. Other birds that are impacted include korhaans, flamingos, secretary birds, cranes, martial eagles, vultures and wetland birds.

Systematic surveys along power lines in the Karoo show that endangered Ludwig's bustards are killed on distribution lines at a rate of one bird per kilometre per year, which amounts to 47,000 birds annually (Jenkins et al., 2012). For a species with a small population confined to the drier parts of south-western Africa, this mortality rate is surely a major threat to its survival.

Mitigation measures

- Research done by Shaw *et al.*, 2021, showed that line markers are effective to prevent collision in some species. In the survey Blue Crane collisions were reduced by 95% when line markers

were used. Collision of all large birds were 51% lower with line markers, but it did not have an effect on bustard collisions.

- Line markers should be installed on the entire 200 km power lines.

3.6.2 DISTURBANCE OF VEGETATION BY HEAVY VEHICLES AND HABITAT DESTRUCTION

Impact

Whenever construction vehicles or other vehicles access the power line, vegetation will be disturbed where vehicles drive and also if pylons are replaced. SCC may be lost and the condition of vegetation will decline. This in turn will negatively affect fauna species and promote the growth of invasive plant species and weeds, as they are generally better adapted to disturbance than indigenous species.

Mitigation Measures

- Construction and maintenance vehicles should stay on the existing service roads as far as possible.
- Peripheral impacts around the maintenance footprint, on the surrounding vegetation of the area, should be avoided.
- During maintenance, sensitive habitats such as riparian areas, must be avoided by construction and maintenance vehicles and equipment, wherever possible, to reduce potential impacts. Only necessary damage must be caused and, for example, unnecessary driving around in the veld or bulldozing natural habitat must not take place.
- If groundworks are to take place along the 200km power line, an ecologist has to search the area for any protected plant or animal species and they must be relocated to a safe area.
- Areas where groundworks have taken place, has to be revegetated, using species indigenous to the specific vegetation unit. Soil has to be tilled / scarified, especially if it was compacted by groundworks. Mulch should be applied. Seed should be collected from plants present at the site and should be used immediately or stored appropriately and used at the start of the following wet season. Plants such as perennial grasses, shrubs, succulents and geophytes can be removed before groundworks and replaced once work is completed.
- Invasive species must be controlled and monitored after groundworks and rehabilitation.

3.6.3 SOIL EROSION AND SEDIMENTATION

Impact

Groundworks may lead to soil erosion by wind and rain.

Mitigation

- If possible, groundworks should be done in the dry season (i.e., April through to October).
- Disturbed areas must be revegetated with species indigenous to that area.

3.6.4 SOIL AND WATER POLLUTION

Impact

Maintenance carries a risk of soil and water pollution, with large construction vehicles contributing substantially due to oil and fuel spillages. If not promptly dealt with, spillages or accumulation of waste matter can contaminate the soil and surface or groundwater, leading to potential medium/long-term impacts on fauna and flora.

Littering by maintenance workers and dumping of building materials or other waste will also cause pollution.

Mitigation

- Spill kits must be on-hand to deal with spills immediately.
- All vehicles must be inspected for oil and fuel leaks on a regular basis.
- Any excess or waste material or chemicals must be removed from the site and discarded of in the correct ways.
- No littering is to take place.

3.6.5 ESTABLISHMENT AND SPREAD OF ALIEN INVASIVE VEGETATION

Impact

Movement of vehicles between sites may spread invasive species.

Disturbance of soil and vegetation may contribute to the growth of invasive plant species, as they are generally more resistant to disturbance than indigenous species.

Mitigation

- Control involves eradicating the plants present, eradicating the seedlings which emerge, and establishing and managing an alternative plant cover to limit re-growth and re-invasion. Weeds and invader plants will be controlled in the manner prescribed for that category by the Conservation of Agricultural Resources Act, No. 43 of 1983 (CARA) or in terms of Working for Water guidelines.
- Institute a monitoring programme where groundworks have taken place for maintenance activities, to detect alien invasive species early, before they become established and, in the case of weeds, before the release of seeds. Once detected, an eradication/control programme must be implemented to ensure that the species' do not spread to surrounding natural ecosystems.

3.7 CATCHMENT OVERVIEW – CONSERVATION AND CATCHMENT MANAGEMENT

3.7.1 NATIONAL FRESHWATER ECOSYSTEM PRIORITY AREAS AND NATIONAL WETLAND MAP 5

3.7.1.1 Mapped Watercourses

Approximately five significant watercourses are crossed by the line. From west to east these are the Bloed, Dwyka, Klip, Koekemoers and Leeu Rivers (**Figure 3-20**). These crossings are highlighted because these flow paths drain catchments of a significant area and will likely carry higher flows at a greater frequency than smaller systems. Their channel widths and riparian zones are also substantially larger than typical watercourses crossed by the line.

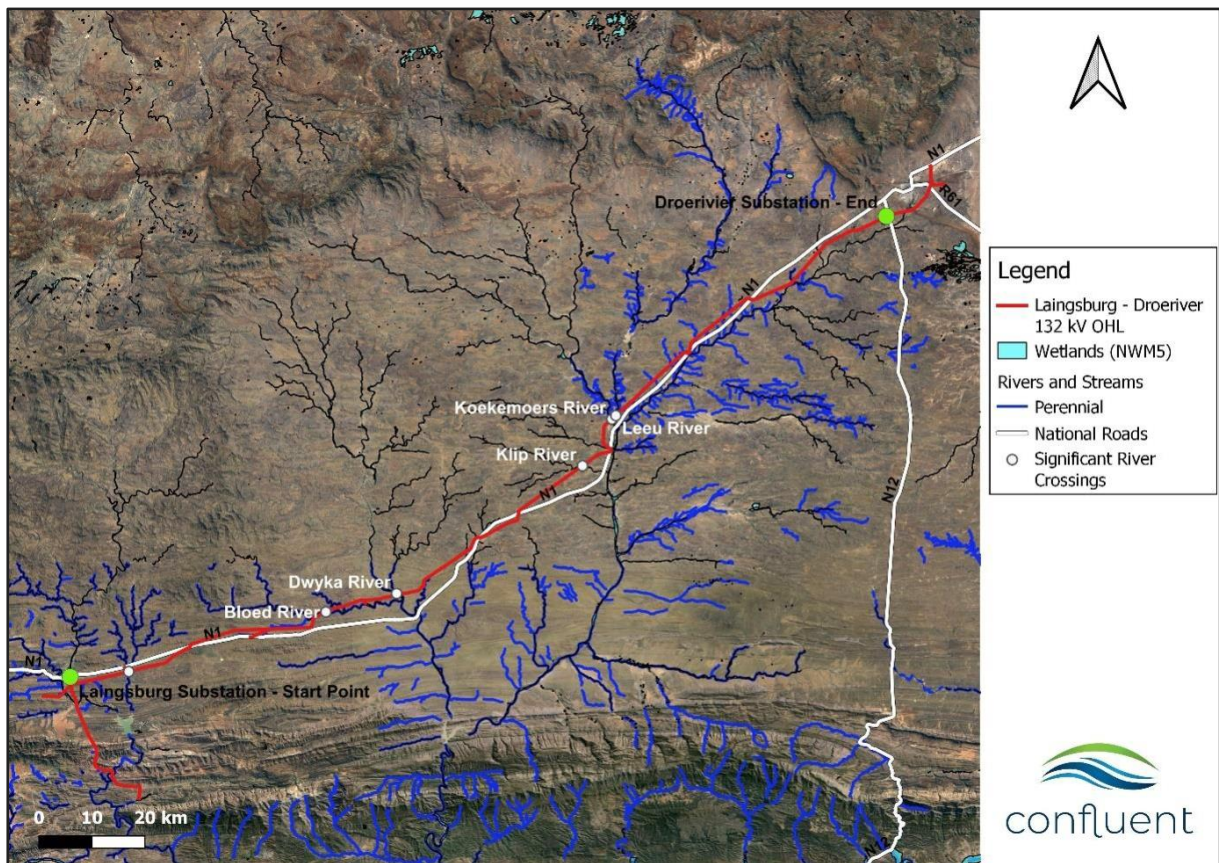


Figure 3-20: Mapped perennial flow paths and wetlands indicating significant river crossings along the distribution line route (Confluent, 2024)

3.7.2 HISTORICAL ASSESSMENT

The comparison between 2021 and 2024 is mainly distinguished by the creation of a new dirt track along the power line, with circular sections around each of the temporary power lines that needed to be erected (**Figure 3-21**). What is also highly noticeable in these two images is the increased density of vegetation along the Leeu River in 2024, highlighting the dynamic nature of the riparian zone. This could be related to encroachment by aliens, but the Koekemoer's River had very little alien vegetation, so is more likely to be fast-growing *Vachellia Karoo* and/or *Searsia Lancea*.



Figure 3-21: Comparative satellite image of the Koekemoer and Leeu Rivers at Leeu Gamka showing the landscape before maintenance (2021, left) and during maintenance when a dirt track became evident along the line (Feb 2024, right).

At the Geelbek River the western pylon is on the edge of the riparian zone, while the eastern pylon is located in dense vegetation in a drainage line with limited access (**Figure 3-22**). There are an additional

two or three pylons in this drainage line. Should these pylons ever need replacement, they should be moved out the drainage line to a more accessible alignment and out of the drainage line. It must be noted that while the drainage line wasn't inspected during the site visit, it is more than likely that it seldom (If ever) experiences flowing surface water. Water movement is likely via interflow, but this can still impact pylon foundations. There is some minor soil disturbance around the substation near the western pylon in 2003, but apart from altered channel morphology and sediment deposition the site appears similar in 2024 to 2003.

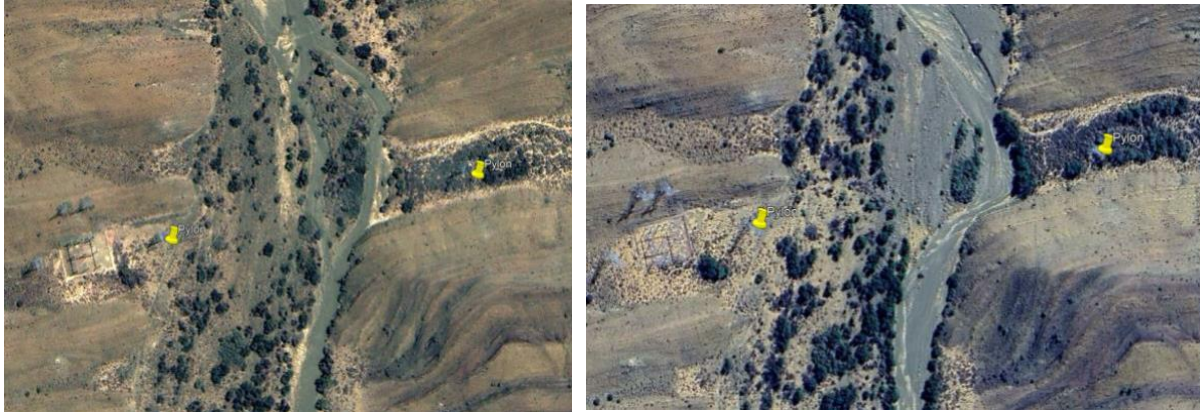


Figure 3-22: Pylons at the crossing for the Geelbek River located showing the eastern pylon in a densely vegetated watercourse in 2003 (left) and 2024 (right).

Pylons that support the crossings of the Bloed and Dwyka Rivers are located outside of any channels or riparian vegetation. Apart from slight alterations in the river meanders, these points have remained relatively unchanged in recent years (**Figure 3-23** and **Figure 3-24**).



Figure 3-23: Comparative image of the distribution line crossing at the Bloed River indicating closest pylons (yellow pins) in 2005 (left) and 2024 (right).



Figure 3-24: Photos of the Dwyka River indicating pylons (yellow pins) in 2018 (left) and 2024 (right). Infrastructure crossing the riverbed is the railway line.

The crossing at Klip River, southwest of Leeu Gamka, is the only one of the larger drainage lines where the pylons could be better located. The southern one is in the riparian zone although not close to the channel, and the north-eastern pylon is possibly located in an overland wash zone, although these are not defined as a watercourse in terms of the NWA.

This may however render the pylon more susceptible to erosion or destabilisation of the foundations.



Figure 3-25: The Klip River indicating the two nearest pylons at the crossing (yellow pins) in 2003 (left) and 2024 (right).

3.8 ECOLOGICAL ASSESSMENT OF AQUATIC ECOSYSTEMS

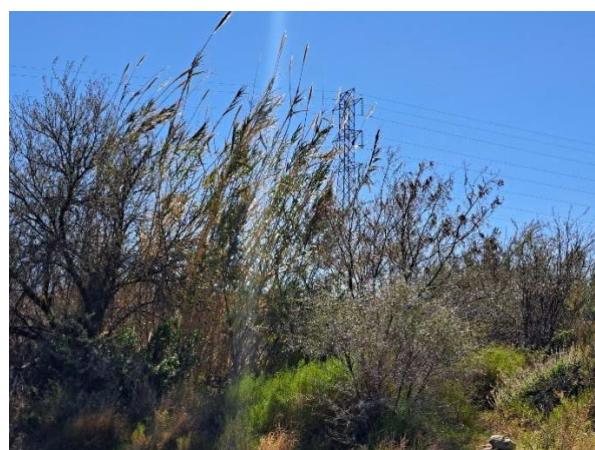
3.8.1 PRESENT ECOLOGICAL STATE

All of the drainage lines and rivers assessed were in a good to excellent condition and would be rated as A/B which is in a Natural to Largely Natural condition according to the Index of Habitat Integrity. There are minor impacts such as alien vegetation, but only two species were observed during the site visit. One was an individual *Prosopis sp.* tree (Mesquite) and *Arundo donax* (Spanish reed) was observed at the Bloed River in a small area. Areas of more significant invasion including other species are likely present, but were not observed during the site visit. Additional impacts are mainly related to existing linear infrastructure including the N1 highway (and other road crossings) and the railway line which includes bridge crossings over the larger rivers.

Given the remoteness of most of the rivers, there is very little rubbish dumping and most litter is windblown. As there is no permanent water in most watercourses there are no alien invasive aquatic animals or macrophytes (aquatic plants) expected. In most cases the riparian vegetation is in a natural state and little to no erosion is evident.



Road crossing with culvert



Minor growth of invasive alien *Arundo donax*



Tracks of cars driving up river beds



Invasive alien *Prosopis sp.* tree (Mesquite)

Figure 3-26: Photos of some impacts typically affecting the Present Ecological State (PES) of watercourses crossed by the powerline.

3.9 FRESHWATER IMPACT ASSESSMENT (CONFLUENT, 2024)

Table 3-10 below outlines the identified impacts associated with the anticipated maintenance activities, along with the proposed mitigation measures that must be implemented to avoid or minimise negative impacts (in accordance with the mitigation hierarchy).

Table 3-10: Maintenance actions and anticipated impacts with recommended mitigation measures for present and future work on the Laingsburg – Droërvier Powerline

Maintenance Action	Potential Impacts	Mitigation Measures
PLANNING PHASE Site establishment which may involve the clearance of trees and other vegetation.	- Excessive clearance/disturbance of riparian vegetation. - Unnecessary access through riparian vegetation or riverbeds.	- Appoint an Environmental Control Officer (ECO) to assist with project planning. - Maintenance team and ECO to have read this entire report. - Define the maintenance area and actions required. - Delineate the extent of the Eskom servitude along the maintenance area. - Map any potentially affected watercourses (use Cape Farm Mapper to indicate wetlands and flow paths). - Delineate riparian zones. - Desktop identification of an access route to the maintenance site that uses existing roads & tracks as far as possible. Use satellite imagery for this. Avoid crossing watercourses wherever possible. - If new tracks must be established, choose a route that minimises disturbance by going in a straight line underneath the power line except if driving around some vegetation instead of cutting it would be beneficial (within the servitude). - If possible, new tracks should be ground-truthed with a Light Duty Vehicle (LDV) (bakkie) - Identify lay-down areas for materials outside of delineated riparian zones, floodplains or riverbeds. - The above maps, diagrams and delineations must be provided to the maintenance team manager (if different to the project manager) along with this report. - Discuss and confirm the type of vehicles that will be required for the maintenance. - Select vehicles with the lightest footprint that can achieve the work required (a 4 x 4 vehicle is acceptable).
CONSTRUCTION PHASE Operation and access of vehicles (trucks, bakkies) and heavy machinery at the maintenance site.	- Excessive clearance/disturbance of riparian vegetation. - Unnecessary access through riparian vegetation or riverbeds.	- Check the weather report. Do not plan access that involves heavy vehicles or machinery during rainfall given the increased risk of erosion and flash flooding. Fortunately, low rainfall in the region means this is not common. - All vehicles must be checked to ensure they have no leaks and are fully operational. In rugged terrain, 4x4 vehicles may be required to ensure full mobility and to avoid vehicles getting stuck. - Prior to work commencing, the ECO/project manager must brief all drivers regarding minimising tracks, sticking to paths, avoiding watercourses and the extent of the servitude. Drivers must be given copies of all maps, track routes, the servitude and watercourse delineations by the ECO. - Between pylon points a single track must be maintained with no deviation. - At pylon points, it may be necessary to work in a wider area. The extent of the Eskom servitude must be temporarily marked out (e.g. wooden pegs, not rocks as there are likely animals beneath them). - Vegetation that must be cleared should be trimmed or cut using handheld saws, clippers, or chainsaws. No soil disturbance or removal of roots using earthmoving equipment is permitted or should be necessary in the riparian zone. - Access to the maintenance site on foot is perfectly acceptable provided workers attempt to follow the same path all the time, and do not trample vegetation unnecessarily. Access on foot would be preferred to vehicles but depends on accessibility where feasible. - Vehicles such as puller-tensioners must be kept out of the riparian zone as far as possible.
CONSTRUCTION PHASE Excavations, earthworks, mixing and pouring concrete for foundations.	Pollution of water resources through sedimentation or concrete wash off.	Excavators should work from beneath the powerline to minimise the footprint of compacting soil while digging. I.e, Work from the inside – out, not the outside in, as the latter might result in expanding the disturbance footprint beyond the Eskom servitude.

		- Concrete should not be mixed on bare ground. For small quantities it can be mixed in wheelbarrows, or on a piece of wooden board. - Water must not be taken from any watercourses for the purpose of concrete mixing or cleaning. - Dirty water cannot be discarded into any watercourse. - All excess concrete must be removed from the maintenance area for disposal at a registered waste site.
CONSTRUCTION Laying out, assembling and erecting pylons/poles.	Increased footprint of disturbance causing unnecessary habitat degradation in watercourses.	- Materials should be laid out beyond delineated riparian zones only. - Ensure that laying out does not extend beyond the Eskom Servitude. - Laying out should be done beneath the powerlines along the access track as far as possible to minimise additional disturbance.
CONSTRUCTION Stringing high voltage cables.	Significant potential to disturb a large area of vegetation and increase the disturbance footprint if not contained.	- Cable reels, generators, and puller-tensioners plus associated equipment should be stored and used beneath the powerline within the Eskom servitude as far as possible. - Avoid setting up puller-tensioners in riparian zones unless undertaking restringing where this is absolutely unavoidable.
DECOMMISSIONING Dismantling of pylons and/or cables and removal of all waste products from the site	May result in debris and materials being left in the environment causing hazards and degradation.	- If the maintenance action involves decommissioning of any equipment, all of the above mitigation measures are still applicable. - Any decommissioned equipment must be carefully removed from the site, with minimal habitat disturbance in the process, and maintaining any disturbance within the Eskom servitude. - All waste materials and litter must be removed from the site and disposed of at a waste facility at the conclusion of maintenance works. - The ECO should do a final site check to determine whether rehabilitation of any disturbed areas will be necessary, and to ensure that all waste has been removed from the site.
REHABILITATION May be required where extensive vegetation clearing (> 25 sqm) has taken place in the riparian zone.	- May result in erosion of riparian zone and/or riverbank. - Vulnerable to invasion by alien vegetation.	- The ECO must determine if rehabilitation is required. - If soil is compacted, then a number of pitter basins should be dug to encourage water pooling on the soil surface which will support regeneration of vegetation. Pitter basins should be hand dug to about 20 cm deep and flat bottomed, measuring about 1 square metres (m²) and spaced about 2 m apart. The aim is to create an uneven surface that encourages water pooling at the site instead of runoff (see image below courtesy Esler <i>et al</i>, 2010).  - If water is available, the area can be seeded with <i>Stipagrostis namaquensis</i> (steekweek) seeded directly into and around the pitter basins which should then be watered at least once. Ideally this should take place during spring (September – October).

3.9.1 LEEU GAMKA MAINTENANCE

Using the recommended mitigation measures outlined in **Table 3-10**, an example planning document was developed by the Aquatic Biodiversity Specialist that can be utilised for the required maintenance at this site.

3.9.1.1 Definition of the Maintenance Area & Actions

- An annotated image is provided in **Figure 3-27** which indicates the extent of the work required across the six pylons as described in section 1.2.
- The riparian zone was delineated for both the Koekemoer's river and the Leeu River.
- Pylons 2 and 3 are located on the edge of riparian vegetation of the Koekemoer's River and caution regarding vegetation and disturbance for these two pylons must be demonstrated.
- The Eskom servitude is 32 m across the width of the line (16 m either side) and is indicated.
- The main access road is the R353.
- The delineated watercourse will be a No-Go area for materials stockpiling and heavy machinery/vehicles for the duration of the maintenance work. This must be indicated with clear signage by the construction / maintenance manager.
- The only activity that can take place across the watercourse is stringing with as low a footprint of disturbance as possible.



Figure 3-27: Annotated satellite image of the Leeu Gamka site indicating the extent of maintenance actions, location of pylons to be maintained, main access road and Eskom servitude. All shown in relation to the delineated watercourse.

3.9.1.2 Access Routes

- Satellite imagery indicates sections where the same track has almost never been driven twice. Although this hasn't occurred in aquatic / riparian habitat, this is not good practice and increases the disturbance footprint unnecessarily.
- Access to Pylons 1 and 2 is from the R353 along the indicated track which is within the 32 m servitude for the most part. Tracks are visible beyond the servitude and should no longer be used. Fortunately, these are not in a watercourse, but it may be necessary to consult a botanical specialist regarding potential rehabilitation of unnecessary tracks.
- Access to Pylons 3 – 6 on the other side of the Koekemoer's River is more difficult. From tracks, it appears that vehicles undertaking emergency works on the powerline seem to have taken a substantial diversion further up the R353, crossing the Koekemoer's River further upstream and then driving beside the Leeu River back down to the power line (**Figure 3-28**). This is a substantial diversion, and there does appear to be a much shorter route to the pylons from the N1 which has been indicated.
- The final track selection must be provided to all drivers with instructions to limit their route to the track indicated only. Substantial and long-term damage can be done to the surrounding veld by driving multiple tracks, which can take years to recover.

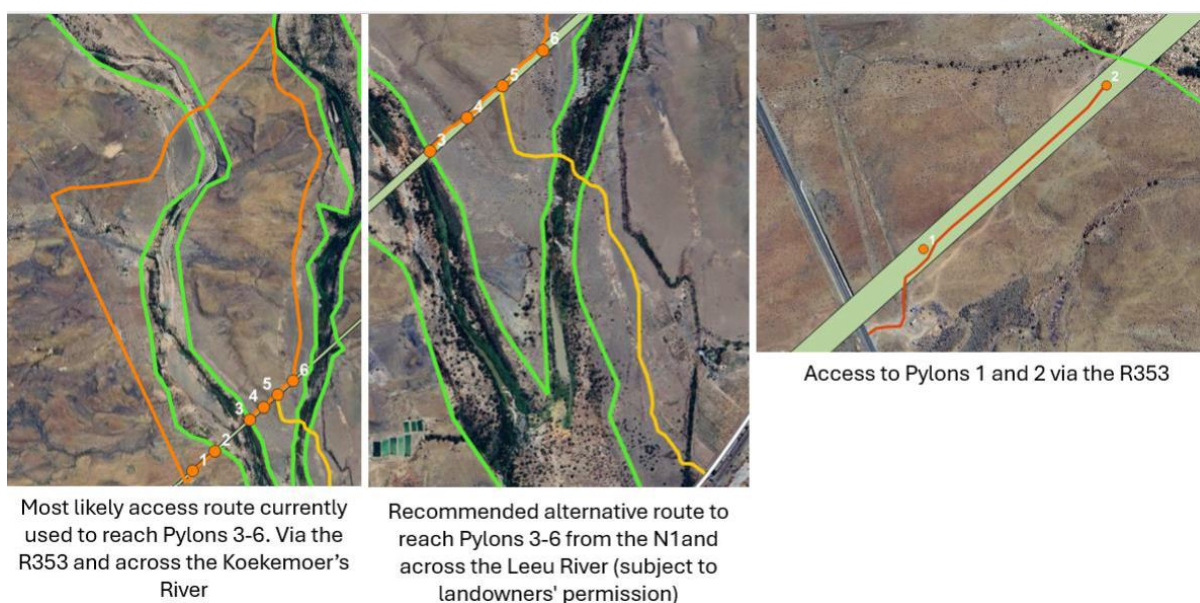


Figure 3-28: Indicated access routes currently in use and a recommended alternative for different parts of the power line.

The remainder of the work undertaken would need to comply with mitigation measures in **Table 3-10** which relate to the actual maintenance work required.

4 ROLES AND RESPONSIBILITIES

The roles and responsibilities stipulated below details the requirements of each party. The overall responsibility for implementation and compliance remains with Eskom, although the delegated representatives must take responsibility for the actions under their management/supervision. Specific responsibilities are defined in **Table 4-1**.

Table 4-1: Roles and responsibilities for MMP implementation

Responsible Person	Responsibilities
Client Operations Manager	Eskom's operations manager has the following responsibility: • Enforcing the compliance of the maintenance activities to the MMP and legal requirements.

	- Ensuring that the correct level of authority is assigned to project team members to enable compliance. - To assign resources to facilitate compliance. - Ensure that this MMP is shared with all contractors awarded maintenance activities associated with the powerline and related infrastructure between the Droërvier and Laingsburg substations.
Client Environmental Coordinator	The Eskom Environmental Coordinator is responsible for: - Oversight of the implementation of the MMP. - Assigning resources to the project team to meet compliance requirements. - Regular monitoring of the activities to observe compliance to the MMP and Eskom's related authorisations and permits.
Client Project Manager	The Client Project Manager is responsible for managing the contractors on site on behalf of Eskom: - Ensure that Eskom and the Contractor are aware of the contents of the MMP and the management measures which need to be implemented. - Be fully conversant with the MMP
Contractor's Construction Manager / Site Agent	The Construction Manager will be part of the Contractor's team and will report to the Project Manager: - Be fully conversant with the MMP and the management measures of the MMP. - Approve method statements. - Have overall responsibility for the implementation of the MMP. - Liaise with the Project Manager on matters concerning the environment. - Prevent actions that will harm or may cause harm to the environment, and take steps to prevent pollution and unnecessary degradation onsite - Confine maintenance activities to the demarcated areas.
Environmental Control Officer (ECO)	The ECO will be part of the project team and will report to the Contractor Construction Manager. The ECO will be responsible for the following: - Conveying the contents of the conditions of the MMP to the Project Manager and Construction Manager at the beginning of construction. - Conducting daily checks during maintenance activities to ensure the contractor is compliant with the conditions of the MMP. - Compiling compliance audit reports.

5 SITE SPECIFIC METHOD STATEMENT

The following serves as a general guide required to minimise the spatial impact of the maintenance activity:

- Repairs and maintenance should be conducted during the drier months, particularly in areas where powerlines cross watercourses and where pylon structures are located within the banks of the watercourse. This approach aims to minimize the impact of maintenance works on the watercourses, except in cases of emergency maintenance.
- Where at all possible, existing access routes should be used. In cases where none exist, a route should be created through the most degraded area avoiding sensitive/indigenous vegetation areas.
- Responsible management of pollutants through ensuring handling and storage of any pollutants is away from the watercourse. When machinery is involved, ensure effective operation with no leaking parts and refuel outside of the riparian area, at a safe distance from the watercourse to manage any accidental spillages and pose no threat of pollution. Spill kits must be on-hand to deal with spills immediately.
- At no time should the flow of the watercourse be blocked (temporary diversions may be allowed; however, this should be done in consultation with DWS) nor should the movement of aquatic and riparian biota (noting breeding periods) be prevented during maintenance actions.
- No new berms can be created.
- In circumstances which require the removal of any topsoil, this must be sufficiently restored through sustainable measures and practices.
- A concerted effort must be made to actively rehabilitate repaired or reshaped banks, as well as areas cleared of vegetation, with indigenous local vegetation. Soil must be tilled / scarified, especially if it was compacted by groundworks. Mulch should be applied. Seed should be collected from plants present at the site and should be used immediately or stored appropriately

and used at the start of the following wet season. Plants such as perennial grasses, shrubs, succulents and geophytes can be removed before groundworks and replaced once work is completed.

- No deepening of the watercourse beyond the original, pre-damage determined thalweg, unless such deepening is directly related to the natural improved functioning and condition of such a watercourse.
- Where at all possible, limit the disturbance to the zone of the thalweg. This is due to the ecological importance of the low flow channel and respective habitat being allowed to re-establish improving the ecological condition.
- The build-up of debris/sediment removed from a maintenance site may:
 - be utilised for the purpose of in-filling or other related maintenance actions related to managing erosion, which form part of an adopted MMP;
 - not be used to enlarge the height, width or any extent of existing berms;
 - not be deposited anywhere within the watercourse or anywhere along the banks of a river where such action is not part of the proposed maintenance activity (ies). Material that cannot be used for maintenance purposes must be removed out of the riparian area to a suitable stockpile location or disposal site. Further action and consideration may be required where the possibility of contaminated material may occur, such as in urban watercourses.
- The use of foreign material, such as concrete, rubble, woody debris and/or dry land based soil, is strictly prohibited from being used in maintenance actions unless for the specific purpose of repairs to existing infrastructure, coupled with appropriate mitigation measures.
- On completion of the maintenance action, the condition of the site in terms of relative topography should be similar to the pre-damaged state (i.e. the shape of the river bank should be similar or in a state which is improved to manage future damage). This ultimately dictates that the channel, banks and bed cannot be made narrower, higher or deepened respectively. Exceptions are considered for systems involved with the management of stormwater and improvements for water quality within the urban context.
- Construction and maintenance vehicles should stay on the existing service roads as far as possible. Peripheral impacts around the maintenance footprint, on the surrounding vegetation of the area, should be avoided.
- Invasive plant species should be controlled through the eradication of both existing plants and any emerging seedlings. Weeds and invasive plants must be managed in accordance with the guidelines set forth by the CARA, or in line with the Working for Water guidelines.

Note: Table 5-1 below is a list of some IAPs that have been recorded during the site visit by Excellence Ecology.

Table 5-1: Invasive Alien Plant (IAP) Species recorded in the project area

Invasive Plant Species			
Scientific name	Common name	Invader NEM:BA category	Photograph ¹
<i>Argemone ochroleuca</i>	White-flowered Mexican poppy	1b	
<i>Prosopis glandulosa</i>	Honey Mesquite	1b	

¹ Reader to note that these are not true pictures captured on site/during the site visit.

			
<i>Salsola kali</i>	Prickly Glasswort / Tolbossie	1b	
<i>Tephrocactus articulatus</i>	Pine cone cactus	1a	

This MMP describes the requirements that must be adhered to, in terms of the environmental control measures, potential risks to be avoided or minimised and positive impacts optimised as far as practicable. **Table 5-2** provides the measures to be adhered to.

Table 5-2: Potential risks associated with the maintenance activities and proposed mitigation measures

Activity	Potential risks	Mitigation/Management Measures	Responsible Party
Agriculture/Soils	Clearance of vegetation along the 132 kV powerline which may lead to soil erosion. ²	Demarcation of no-go areas.	- Construction Manager - ECO
		Remove usable topsoil and subsoil from demarcated areas to be disturbed and stockpile in the designated area.	- Construction Manager - ECO
		Limit vegetation removal to physical footprint.	- Construction Manager - ECO
		Topsoil and subsoil stockpile to be used as part of maintenance activities must be maintained when stockpiled for its duration. Erosion of stockpiles must be prevented and remediated, should it occur.	- Construction Manager - ECO
		The topsoil stockpiles must be vegetated and maintained to preserve the nutrient content .	- Construction Manager - ECO
		Erosion control measures (for wind and water erosion) must be implemented and maintained in areas disturbed by maintenance such as revegetation of areas with natural vegetation.	- Construction Manager - ECO
		To reduce dust, topsoil stockpiles must be watered regularly until the topsoil stockpiles have been re-vegetated.	- Construction Manager - ECO
		To reduce dust, water or an appropriate dust suppressant must be sprayed onto exposed surfaces.	Construction Manager
		Rehabilitation of disturbed areas must be done by loosening/ripping soil and rehabilitated by using indigenous grasses/vegetation.	- Construction Manager - ECO
		Soil stockpiles must not be deposited / stored within riparian areas (watercourses and their banks).	Construction Manager
		Topsoil must be monitored to ensure recovery and maintain its biological function.	Environmental Coordinator

² Clearing of indigenous vegetation outside the existing servitude is not permitted and will require the relevant approvals prior to the commencement of activities.

	Soil compaction due to heavy machinery during construction.	Maintenance vehicles must be restricted to the demarcated roads.	Construction Manager
		Rehabilitation of disturbed areas must be done by loosening/ripping soil and using indigenous grasses/vegetation.	Construction Manager
	Increased runoff to surrounding system due to vegetation disturbance and new infrastructure.	The maintenance infrastructure to be installed shall be included into the stormwater management plan ³ .	- Environmental Coordinator - Operations Manager
	Soil pollution due to hazardous substances spills.	This MMP and applicable environmental controls and specifications and conditions must be included in all maintenance contracts and sub-contracts, thereby making contractors accountable for preventing accidental spillages.	- Project manager (procurement phase of the project) - Construction Manager - Environmental Coordinator
		All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken on site unless they are conducted on impervious surfaces.	- Construction Manager - ECO
		All earth moving vehicles and equipment must have drip trays underneath the engine and fuel tank to prevent soil contamination from leaks and spills.	ECO
		All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. Storage areas must be well marked with appropriate signage.	- Construction Manager - ECO
		Spill kits to be on site always.	Contractor's Construction Manager
		If a spillage of a hazardous substance occurs, the resultant hazardous waste must be cleaned up using spill kits on site and treated or disposed of appropriately.	- Contractor's Construction Manager - ECO
		Any incidents must be reported to the CA as soon as possible. Measures must be put in place to prevent similar incidences from occurring. If necessary, remediation of any contamination must be carried out.	- Contractor's Construction Manager - ECO

³ A stormwater management plan should be developed if one does not already exist, especially for the area in Leeu Gamka where pylon structures will be replaced.

		All hazardous waste must be re-used, recycled, treated or disposed of at licensed facilities and stored in designated, lined, and bunded areas (for no longer than 90 days).	- Contractor's Construction Manager - ECO
	Loss of topsoil due to incorrect stockpiling (including re-vegetation).	Remove all topsoil from maintenance sites and stockpile.	- Construction Manager - ECO
		Limit vegetation removal to areas not impacted by the project areas.	ECO
		During maintenance activities, special attention must be given to the maintenance of the topsoil and soil stockpiles.	ECO
		Re-vegetate any topsoil stockpiles to prevent erosion and loss of nutrients.	ECO
		To reduce dust, water or an appropriate dust suppressant must be sprayed onto topsoil stockpiles until the topsoil stockpiles have been re-vegetated.	- Construction Manager - ECO
		Topsoil stockpiles to be monitored and inspected weekly for re vegetation and no erosion.	ECO
	Incorrect disposal of waste aggregate. Waste material is not stockpiled and stored correctly.	All waste aggregate to be removed from site and re-used, recycled, treated or disposed of at a licensed waste management facility unless material is reused during maintenance activities.	- Contractor's Construction Manager - ECO
		If waste aggregate is stockpiled on site, this must be within the allocated demarcated area.	Contractor's Construction Manager
Landscape	Litter and bad housekeeping from maintenance staff.	All maintenance staff will be made aware of the waste management procedure.	Contractor's Construction Manager
		Bins to be made available by the contractor for the disposal of general and hazardous waste during maintenance activities.	Contractor's Construction Manager
	Clearing of vegetation along the powerline route.	Remove the absolute minimum vegetation and topsoil along the powerline.	ECO
		Ensure that all existing natural vegetation is retained wherever possible and incorporated into the site design.	Engineering team
	Inadequate rehabilitation of the maintenance footprint.	The Contractor will be instructed to rehabilitate areas as soon as maintenance activities within those areas have ceased.	ECO

		Rehabilitation specification must be incorporated into the maintenance contractors' requirements.	Project Manager
Archaeological and Cultural Heritage	Archaeological and cultural heritage chance finds during the excavation within the affected areas.	All contractors to implement "Chance Find Procedure".	- Project Manager - Contractor's Construction Manager
		Should any archaeological artefacts be exposed during maintenance, the activities near the findings must be stopped immediately.	Contractor's Construction Manager
		Under no circumstances shall any artefacts be destroyed. Such an archaeological site must be marked and fenced off, and the South African Heritage Agency (SAHRA) must be contacted immediately.	Contractor's Construction Manager
		If these appear to be human remains, the South African Police Service must also be contacted.	- Project Manager - Contractor's Construction Manager
Paleontology	Paleontological chance finds during the excavation within the expropriation areas.	All contractors to implement "Chance Find Procedure".	- Project Manager - Contractor's Construction Manager
		Should any paleontological artefacts be exposed during construction, the activities near the findings must be stopped immediately. Under no circumstances shall any artefact be destroyed. Such a paleontological site must be marked and fenced off, and the SAHRA must be contacted immediately.	Contractor's Construction Manager
Terrestrial Biodiversity including Plant and Animal Species	Loss of floral species	Proposed mitigation would mainly be to avoid disturbance to the patches of natural vegetation wherever possible.	- Contractor's Construction Manager - ECO
	Potential loss of species of concern	Protected species permits are required from the DFFE for disturbance (cutting or removal) of any protected trees. Species to be removed prior to clearing.	- Project Manager - Contractor's Construction Manager - ECO
		If avoidance is not possible, impacted protected tree species to be replaced (like-for-like where possible), in a suitable nearby location.	- Project Manager - Contractor's Construction Manager - ECO
	Potential sedimentation and erosion due to maintenance activities.	Erosion control structures must be put into place where soil may be prone to erosion.	Contractor's Construction Manager
		Topsoil and subsoil should be stockpiled separately.	- Contractor's Construction Manager - ECO
		Topsoil and subsoil stockpile storage should not exceed a height of 2 m.	- Contractor's Construction Manager - ECO

		During rehabilitation, prompt and progressive reinstatement of bare areas is required. The topsoil layer is to be replaced on top during reinstatement.	- Contractor's Construction Manager - ECO
		Checks must be carried out at regular intervals to identify areas where erosion is occurring.	- Contractor's Construction Manager - ECO
		Remedial action, including the rehabilitation of eroded areas and, where necessary, the relocation of the paths causing erosion, is to be undertaken.	- Contractor's Construction Manager - ECO
		Sediment loads should be prevented from entering watercourses.	- Contractor's Construction Manager - ECO
	Infestation of alien invasive species within areas where maintenance activities have occurred.	Natural open spaces outside the existing Eskom servitude footprint should be left in their undeveloped state.	ECO
		Upon commencement of maintenance, a photographic record of IAPs present in the maintenance site, as well as in nearby areas, must be made.	- Contractor's Construction Manager - ECO
		After revegetation has been completed, the Contractor must remove weeds and alien plant species at the maintenance sites and adjacent areas on a monthly basis, until the end of the defects liability period of the contract.	- Contractor's Construction Manager - ECO
		Special care must be taken when removing alien invasive plants from site, so as to not to leave any part of the plant behind. When removing alien invasive plants, soil disturbance must be minimised to prevent as little germination as possible as alien invasive plants can spread their seeds when disturbed.	- Contractor's Construction Manager - ECO
		All felled or cut alien invasive plants must be removed from site and appropriately disposed of.	- Contractor's Construction Manager - ECO
		Care must be taken to avoid the introduction of alien invasive plant species to the site. Particular attention must be paid to imported materials such as building material, fill material or dirty earth moving equipment. Stockpiles should be checked regularly and any weeds emerging from material stockpiles must be removed.	- Contractor's Construction Manager - ECO

		A monitoring program should be put into place to remove alien vegetation and maintain areas free from alien invasions during construction.	• Contractor's Construction Manager • ECO
		Rehabilitation should be undertaken on a progressive basis in these areas.	• Contractor's Construction Manager • ECO
Socio-Economic Environment	Job opportunities.	As part of the contractor's contract, contractors will be required to meet a certain target of employing labourers from the local community.	• Project Manager • Contractor's Construction Manager
	Influx of people to the area seeking employment.	As part of the contractor's contract, contractors will be required to meet a certain target of employing labourers from the local community.	• Project Manager • Contractor's Construction Manager
		Should labour be required during the maintenance activities, consideration must be given to sourcing the labour from the local communities. This requirement must be specified within the contract signed by the contractor. This will contribute to the local gross domestic product of the area.	• Project Manager • Contractor's Construction Manager
Air Quality	Increased nuisance dust fall rates associated with maintenance activities.	Dust suppression must be undertaken using water or other dust suppressants sprayed onto open areas / topsoil stockpiles.	• Construction Manager
		Reductions of vehicle exhaust emissions by ensuring equipment is in good working order.	• Contractor's Construction Manager

6 MONITORING AND REPORTING

It is important to note that any activities undertaken outside the scope of the adopted MMP, in terms of the action outlined within the given method statement, the responsible person(s) will be subject to Section 24(F) of NEMA and that appropriate enforcement and compliance requirements will follow.

The implementation of this MMP should be monitored by a suitably qualified ECO. The ECO should monitor the following:

- Repair work is completed according to original specifications.
- No new erosion or sedimentation has occurred.
- The bed and banks of watercourses and wetlands impacted by tree felling and the removal of invasive alien grasses are in good condition, without signs of erosion or bare areas.
- IAPs have been removed from prioritised areas (i.e., within a 25 m radius of each maintenance activity).
- Vegetation management has not led to a deterioration in the condition of watercourses and wetlands (i.e., the PES has remained unchanged, with the desired outcome being the maintenance of existing conditions).
- Areas within the streams, wetlands, and their ecological buffers that have been impacted by maintenance activities have been replanted.

Any issues such as failed re-vegetation or erosion should be addressed immediately upon detection during the monitoring process. Corrective actions may include re-initiating rehabilitation in severe cases or directly addressing the identified problems. If issues arise from constructed infrastructure that were not anticipated in this plan, an engineer and wetland specialist should be consulted as soon as possible.

7 CONCLUSION

The MMP must guide the activities associated with maintenance of the 132 kV overhead line and associated pylon structures between the Droërvier and Laingsburg substations in the Central Karoo District Municipality of the Western Cape Province. This includes the activities required to address the damage to pylons that has already occurred in the Leeu Gamka area. Recommendations for further steps are as follow:

- Incorporation of the MMP into the Eskom environmental management system.
- Auditing of the activities.
- Regular review of the MMP against maintenance activities where it may apply.
- It is proposed that the MMP be reviewed every five years from the date of the decision.

Care must be taken to ensure that the disturbance footprint associated with access is minimised. The 32 m servitude along the line must be respected, and any disturbance beyond the servitude should be prevented as much as possible.

Apart from stringing operations, which may inevitably disturb watercourses where they are crossed, access through watercourses should be strictly avoided and limited to absolute necessity.

The involvement of an ECO during the planning and construction phases of maintenance is crucial for ensuring that the mitigation measures outlined in this MMP are strictly applied.

ANNEXURE A: DETAILS OF THE EAP

ANNEXURE B: CORRESPONDENCE WITH DFFE

ANNEXURE C: SPECIALIST REPORTS

ANNEXURE D: EAP DECLARATION

ANNEXURE E: PUBLIC PARTICIPATION DOCUMENTS

In diversity there is beauty and
there is strength.

MAYA ANGELOU

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