THE PROPOSED CONSTRUCTION OF LOOP IN LOOP OUT 132KV POWER LINE FROM THE MAKONDE SANARI POWERLINE TO THE PROPOSED 132/22KV MUTSHIKILI SUBSTATION AT THENGWE WITHIN THULAMELA LOCAL MUNICIPALITY, VHEMBE DISTRICT MUNICIPALITY, LIMPOPO PROVINCE

PREPARED BY:

PREPARED FOR:

Report Name:	Basic Assessment Report for the proposed construction of loop in loop out 132kv power line from the Makonde Sanari Powerline to the proposed 132/22KV Mutshikili Substation at Thengwe within Thulamela Local Municipality, Vhembe District Municipality, Limpopo Province
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Report Date:	September 2023
Status:	**Draft Report**
This document presents the Draft Basic Assessment Report for the 132kV loop in loop out power line and the proposed Mutshikili substation. The information and assessment presented is based on the information supplied by the 'applicant', Eskom, environmental baseline data collected during the field surveys, Specialist assessments/ studies conducted from 2016 to date and stakeholder opinion.	

DISCLAIMER

DIGES Group has prepared this report in fulfillment of Section 24 (5) of NEMA and its associated Regulations, showing reasonable skill and care, for the intended purposes as stated in the agreement under which this work was completed. The report may not be relied upon by any other party without the express agreement of the client, Eskom. No other warranty expressed or implied is made as to the professional advice included in this report. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by DIGES Group for inaccuracies in the data supplied by any other party. The conclusions and recommendations in this report assume that all relevant information has been supplied by those bodies from whom it was requested. Where field investigations have been carried out these have been restricted to a level of detail required to achieve the stated objectives of the work. This work has been undertaken in accordance with the EIA Regulations, GNR326 of 7 April 2017 (as amended).

APPROVAL SCHEDULE		
REV	DIGES GROUP	
	Compiler	Reviewer
00	 B. Makanza 12.09.2023 Date	 L. Rasilingwani 13.09.2023 Date

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EXECUTIVE SUMMARY

A. BACKGROUND

Eskom Distribution: Limlanga cluster (Limpopo Province) (hereinafter referred to as Eskom) proposes to build the Mutshikili Substation, with a project footprint of approximately 100m by 100m, as well as a 132kV loop in loop out power lines, approximately seven (± 7) kilometers in length, extending from the Makonde- Sanari Powerline to the proposed Mutshikili substation within Thulamela Local Municipality, to fulfil their mandate of providing a high-quality supply of electricity to support annual load growth and improve the operational flexibility of the existing electricity network The proposed project was previously issued an Environmental Authorization (Ref No.: 14/12/16/3/3/1/2122) in 2011, but owing to unanticipated events, the Environmental Authorization expired before work could start. As a result, DIGES Group submitted a new application in 2018/19, DEA Ref. 14/12/16/3/3/1/2122, for a two-kilometer powerline corridor and two alternative substation sites.

Although the spatial data sourced from the Department of Environment, Forestry, Fisheries, and the Environment (DFFE) regarding, conservation areas indicated that the project was within a protected area, the Final Basic Assessment Report (FBAR) did not attach comments from the Conservation Area Management Authority, Limpopo Department of Economic Development, Environment and Tourism (LEDET), leading to the issuance of a negative authorization. A successful appeal against this judgment was filed, however because the necessary documentation was not submitted in a timely manner, a new application was necessary. On the 28th of July 2022, an application (DFFE Reference No.: 14/12/16/3/3/1/2596) was submitted with a Draft Basic Assessment Report (DBAR). However, water ingress was noted at the preferred substation (Alternative 1) during the public review period as two additional substations (Alternative 3 and Alternative 4) were therefore identified for assessment. The Final Basic Assessment Report (FBAR), however, could not be submitted within the prescribed 150 days hence the application was withdrawn on the 23rd of November 2022.

A new application is being lodged and this DBAR is being submitted as part of the new application for Environmental Authorization for the proposed works. In addition to the powerline corridor (Alternative 1) identified and assessed in 2018 and four substation site alternatives identified and assessed in 2018 and 2022 respectively, one additional route alternative (Alternative Corridor 2) has also been assessed.

B. LOCATION

The Project Area is located near Maheni, Thengwe, Tshilavulu and Makwilidza, approximately twenty-five kilometres northeast of Thohoyandou in the Limpopo Province. The Project Area falls in the southern parts of the Soutpansberg and involves flat pieces of land on opposite sides of the foothills of the Soutpansberg whilst the proposed new power lines also cut across a poort (neck) in the Soutpansberg.

C. BASIC ASSESSMENT PROCESS

The construction of the distribution powerlines, Mutshikili substation and associated infrastructure triggers activities incorporated in the National Environmental Management Act, Act 107 of 1998 (NEMA), Environmental Impact Assessment (EIA) Listing Notices 1 (Government Notice R327) of 2017 and Listing Notice (Government Notices R324) of 2017 as amended. As such a Basic Assessment Process must be undertaken per as per Regulation 19, 39 to 44 and Appendix 1 of the EIA Regulations, GNR 326 of 2017 as amended. Eskom Distribution: Limpopo has therefore appointed DIGES Group to carry out the Basic Assessment Process.

D. ALTERNATIVES

i. Powerline Corridor and Substation Alternatives

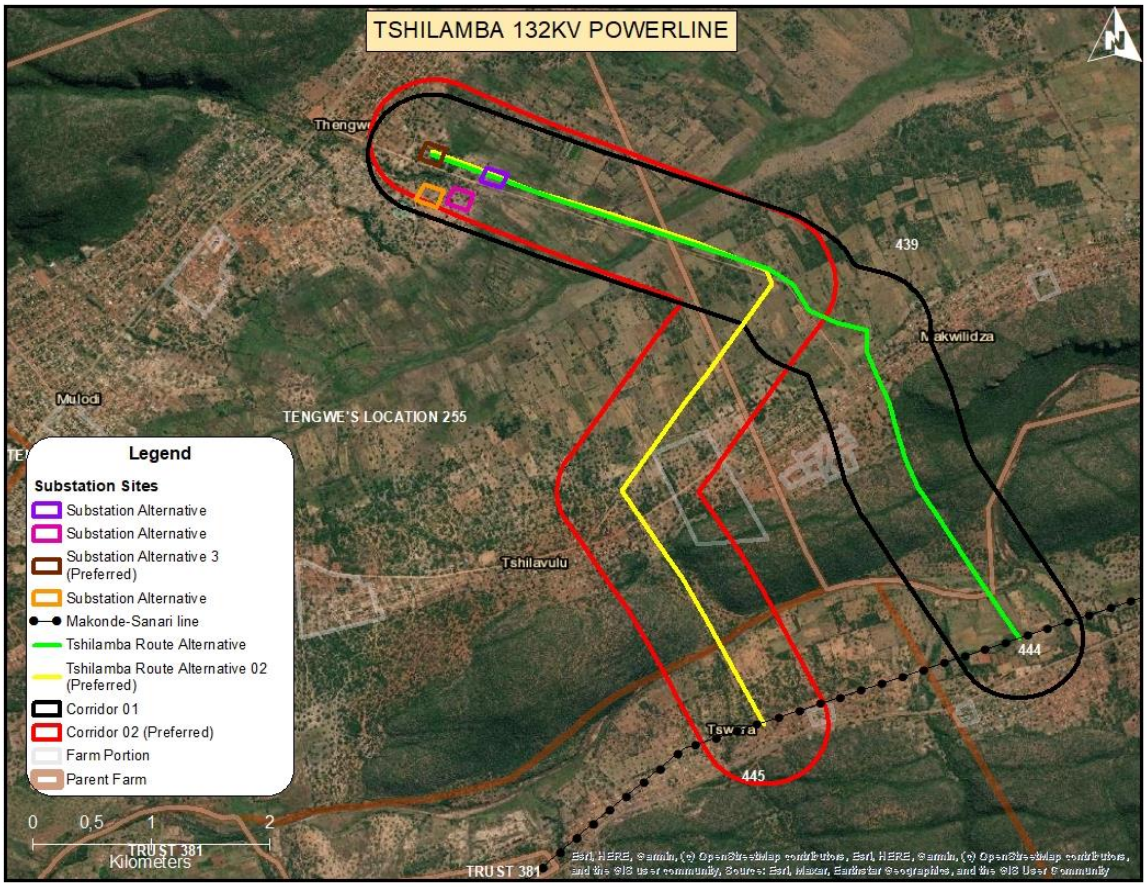
Powerline Corridors

Two alternative powerline corridors, each with a width of 1000m have been assessed and they start from an existing Makonde-Sanari power line near Tswera village south of the Mutale River. From the T-off point, the corridors will run in a northerly direction crossing the river with Corridor 1 passing over a low mountain at Makwilidza then cutting and bending across the settlement area. Corridor 2 will traverse between two low mountains then cut and bend across Tshilavulu village and subsistence farms. The corridors will then merge and run parallel along a gravel road, following a direct route to the proposed substation site (Alternative 3) east of Thengwe. Constructing across the mountain will exacerbate degradation of a Critical Biodiversity Area and construction costs in the mountain area is generally high hence Corridor 2 is preferred as it will traverse across a valley (between two low mountains) lowering construction costs and minimizing habitat transformation.

Substation Alternatives

Substation Alternatives 1 and 3 are generally similar and the same is true for Alternatives 2 and 4. The four sites are nearby as such the biophysical environment is similar except for the erosion and the drainage line noted at alternatives 2 and 4. Constructing a substation at sites 2 and 4 will exacerbate the erosion that is noted at the site, whilst the water ingress noted at substation site 1 exacerbates

construction costs. Site alternative 3 is therefore the preferred alternative. Reference is made to the map below:



ii. Substation Layout

Substations are built to ESKOM's specific standards in terms of their structure and layout for operation and maintenance purposes. The proposed 132/22kV, 2x20MVA Mutshikili Substation is therefore expected to be generic with standard specification for such infrastructure. Operation alternatives were not considered because ESKOM has standards and regulations in place for the operation and maintenance of 132kV power lines and 132/22kV substations.

iii. Activity Alternatives

In terms of activity alternatives, overhead line and underground cables system were considered with the comparison of aspects such as magnetic fields, engineering, and costs. The overhead line was found to have low capital costs, easy maintenance, and reduced maintenance costs so it was considered a viable option for strengthening the network.

iv. No-go Alternative

The No-go alternative should always be assessed. Should the development not proceed, the area will remain unchanged and will continue to be used for grazing and farming unless a different development is undertaken. However, as there have been impacts associated with wood collection, these would persist within the natural areas (mountain).

In addition, the non-implementation of the project would result in:

- A failure to contribute to the realization of Sustainable Development Goal 7: affordable, reliable, sustainable, and modern energy for all by 2030.
- A failure to build and strengthen the distribution network to accommodate growth in customer base. Thulamela Local Municipality's IDP has indicated that within Vhembe District, Thulamela has the highest population concentration with a 0.6% annual growth rate. The municipality's electricity needs are therefore higher than what the existing network can provide.
- Loss of economic opportunities that would have been realized during the construction phase of the project.

E. SPECIALISTS ASSESSMENTS

Considering the project alternatives and the nature of the environment, potential environmental impacts were identified through an internal process based on similar developments, site visits and the Screening Report generated from the DFFE Screening tool. Specialist studies were therefore commissioned to gain an in-depth understanding of the status quo of various aspects of the environment and how the development will impact these environmental aspects. The results of these studies serve as a basis to identify the potentially significant impacts expected should the development be undertaken. RFI and Civil Aviation, while they have been indicated in the Screening Report and are important, have not been commissioned. A summary of the Agricultural, Avifauna, Archaeological, Aquatic, Geotechnical, Hydrological, Paleontology, Terrestrial Biodiversity (inclusive of flora and fauna), Visual and Wetland Assessments commissioned are given below:

I. **Agricultural:** The proposed area is rural, where farming is the primary source of income and food security for most families. 45% of the land at Corridor 1 is cultivated for dry land purposes compared to 55% of Corridor 2. However, much of this area is restricted by shallow rock emanating from a rock outcrop, bedrock, or stiff clays. Both corridors, Alternatives one and two, pass through crop fields and rangeland land vegetation with less natural grass and orchards. However, route alternative 2 passes through fields where more crops are grown, which may potentially cause significant disruption in farming operations. Corridor 1 appears to be the more

suitable choice for powerline development as it allows for uninterrupted subsistence farming operations.

The Substation sites are all located in low-capability soil and are dominated by sandy soil. Substation alternatives 1, 2, and 4 are located within crop fields and some rangeland vegetation, making them less suitable for the proposed project. Substation Alternative 3 is far from the crop fields, which makes it more suitable for the proposed power line. It is anticipated that the construction phase will have impacts ranging from **low to medium** and that implementing the recommended mitigation measures will reduce these impacts. No additional impacts are anticipated for the operational phase of the development. The detailed report is attached to Appendix E-1.

II. **Archaeology:** Archaeological sites dating to the Stone, Iron and Historical Age are known to occur in the wider region of the study area. From the survey conducted, there was no archaeological site noted in any of the proposed corridors (s). Although no remains of Stone/ Iron Age sites were noted during the site visits, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools, particularly next to the river. It should be noted that in the Iron Age people preferred to settle on the alluvial soils close to rivers. As such, all riverbanks are considered sensitive and should be avoided in the best way possible. The impact on graves is of concern as several graves have been noted in the proposed study area, especially in corridor one. Based on the assessment, Substation Alternative 1 is the most preferred alternative since the land appears to have been used in the past for issues related to farming, and areas of this nature are not ideal for archaeological materials as any materials that could have existed there, would have been destroyed by past farming activities. This is followed by Site Alternative 2, 3 and then 4. Route Alternative 2 is also the most recommended since it mostly transverses over farmland and a few graves. Accordingly, and from a holistic perspective, any alternative will not have a significant negative impact from a heritage impact perspective. Reference is made to Appendix E-2.

III. **Aquatic Ecology:** Two major freshwater ecosystems were identified along the proposed route for the 132kV Tshilamba powerline routes (i.e., Alt 1 and Alt 2). The assessed points were in good condition as most were rated to be of moderate conservation importance. The potential for the encroachment of infrastructure associated with the proposed powerline routes (especially pylons and access roads) into freshwater ecosystems is **Minimal** as the powerline (be alternative 1 or alternative 2) only crosses two points but the Mutale River crossing has a widespread wetland in which the line may need to be adjusted. From the aquatic assessment there is no difference in terms of order of preferences of the powerline route. Both powerline routes (Alt 1 and 2) cuts through the Mutale River which is regarded as an NFEPA and the seep. The preferred substation is alternative 3. The full report is attached in Appendix E-3.

IV. **Avifauna:** the habitat within which the Project Area of Influence (PAOI) is located is considered to have a **moderate to low** sensitivity. In recent years, anthropogenic impacts, mostly peri-urban, pastoral, and agricultural activities have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the Mutshikili Substation and 132kV power line will result in impacts of **medium-low** significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through mitigation measures. It is anticipated that the Mutshikili Substation and 132kV power line can be constructed with acceptable levels of impact on the resident avifauna. The 132kV power line will increase the total number of existing and planned high voltage lines by a small percentage, therefore, the contribution of the proposed 132kV power line to the cumulative impact of all the high voltage lines is deemed to be of **low** significance. The combined cumulative impact of the existing power lines, i.e., the 132kV power line and all future proposed power lines on avifauna within a 30km radius, is of **medium** significance. Substation Alternatives 2 and 4 are located adjacent to an ephemeral drainage line and a dam - habitats that are likely to attract a variety of priority species. **Alternatives 1 or 3** are therefore nominated as the preferred substation alternative. Corridor Alternative 1 is approximately 6.5km long, and Corridor Alternative 2 is approximately 7.5km long. On this basis, **Corridor Alternative 1** is nominated as the preferred power line alignment alternative. However, it is important to note that neither of the two power line alternatives are fatally flawed, and the proposed 132kV power line can be constructed and operated in either of the two alternative corridors with appropriate mitigation. The full report is attached in Appendix E-4.

V. **Biodiversity:** The vegetation along both corridors is severely modified, with exceptions on the mountains where the impacts are low but increasing due to wood harvesting, grazing, and trampling. On the mountain, two scenarios are present. Some large Sclerocarya birrea, Combretum imberbe, Afzelia quanzensis and Adansonia digitata were noted. Several alien invasives were noted, and none of the four red data species listed will occur on site, as no suitable habitat is present. The “medium sensitivity” rating of the Screening Tool Report can be lowered to “low” as none of the listed species were present, probably due to the loss of habitat and exploitation. When adding the changes noted in the natural vegetation, including the increased degradation on the mountains, it is evident that the scarce species are under severe threat in the area. Very little animal activity (apart from domestic) was noted. It is recommended to use Alternative 3 for the proposed new Mutshikili Substation as it is the furthest from any drainage lines and will lower the impact on the water resources. The corridor (Alternative 2) following the “valley floor” is more acceptable due to the current impacts. It will ensure easy access during construction and limited clearing of trees and shrubs is needed. The full report is attached in Appendix E-5.

VI. **Civil Aviation:** The analysis contained in this CASS has determined that the powerline and associated ground-based infrastructure would not materially impact radar or navigation infrastructure in the environs, nor present any material additional risks to operations at any nearby aerodromes, within the contemplation of the 2020 Protocol. On this basis, therefore, it is recommended that the Sensitivity Classification of the proposed development be amended to low, The Site Sensitivity Report is attached in Appendix E-11.

VII. **Geotechnical Investigation: Geotechnical:** the site is underlain by alluvium sand and a river–terrace of Quaternary era. This is underlain by pink quartzite, sandstone, minor conglomerate and shale of Wyllies Poort Formation, Soutpansberg Group, Mokolian Era. No structural feature traverses the site. Based on the laboratory test. The following steps shall be adhered to during foundation base preparation.

- ✓ Remove 0.3m of topsoil and store it for reused during landscaping
- ✓ Removed 0.3m to 3m of alluvial sand and store it for reuse as construction materials

VIII. **Hydrology:** Corridor 1, located in catchment 1, experiences a larger area of inundation as it lies in the transfer zone of the Mutale River with multiple tributaries feeding into the river around the proposed construction site. Corridor 2 intersects the Mutale River mid-segment (Catchment 1), wider flood lines were observed across the pediment with a south-eastern direction. These flood lines encroach upon cultivated land along the north banks of the Mutale River segment. However, it is important to note that upstream storage and wetlands contribute to flood attenuation, resulting in lower peak flows downstream. This indicates that the impact of the proposed powerline construction on the hydrological setting of corridor 2 is minimal to negligible. In addition, there are no hydrological impacts at the substations close to Catchment 2, as they are situated further away from any water course. Therefore, the substations' location remains unaffected by potential flooding events, contributing to the overall safety and stability of the powerline infrastructure in catchment 2.

IX. **Paleontology:** The proposed substations and powerline routes lie mostly on the moderately sensitive Quaternary sands and alluvium with the northernmost and southernmost section on the Wyllie’s Poort Formation (Soutpansberg Group). No fossils have been reported from this area. Nonetheless, a Fossil Chance Find Protocol should be added to the EMPr. Since the impact will be very low, the project should be authorized. There is no preferred route and no preferred site for the new substation as far as paleontology is concerned.

X. **Visual:** The visual resource rating will be low since the area is “highly modified with extensive infrastructure development (towns and villages), power lines, roads, settlements, telephone and communications towers and agricultural activities i.e., cultivation and grazing. From a visual exposure perspective, the new development will have a substantial impact on the receiving communities. The larger trees in the riparian zone of the Mutale River will have a limited barrier

effect from a visual perspective. The high pylons with the conductors will be visible along the largest part of the corridor. Although the structure at the substation is low (mostly a single story), the exposed nature of the site will result in being visible from all directions. Taking all the above information into account, the impact of the lights at the substation during the nights must be noted. The full report is attached in Appendix E-9.

XI. **Wetlands Delineation:** Two channeled valley bottom wetlands and a river floodplain were identified and referred to in this report as Wetland A, B and C where Wetland A refers to the wetland or drainage line section located near Alternative 2 and Alternative 4 and Wetland B refers to the wetland section delineated almost midway point from the proposed Mutshikili sub-station site towards the two villages Makwilidza and Maheni. Wetland C refers to the section where the proposed powerline crosses the Mutale River from the Makonde T-off near Tswera. The impact is anticipated mainly at the crossing points of the river floodplain, riparian zones and the NFEPA wetland however, the study has found no potential impacts that could be fatal flaws. Despite this, there is substantial environmental sensitivity, with the Mutale watercourses (CBA areas) and their surrounds and the NFEPA wetlands being the primary features of concern. The EIS was determined to be Very High, High and Low / Marginal for Sections C, B and A respectively. The Ecological Management Class (EMC) was determined to be A, B & D respectively whilst the Present Ecological Status (PES) was to be B, B and C respectively. Substation site alternative 3 is the most preferred whilst Corridor 2 is the most preferred. The full report is attached in Appendix E-10.

F. PUBLIC PARTICIPATION PROCESS (PPP)

A reconnaissance site visit was undertaken at the inception of the screening phase in 2016. This was done to develop an understanding of the social context (representative structures; language; communication media, etc.). The outcome of this site visit was that information to the communities in the receiving environment would be first distributed via leadership structures that are available in these communities, namely traditional leadership. The native language was utilized for communication during the meetings.

The stakeholder database compiled during the previous application was updated and the database submitted with this report includes stakeholders from:

- National, Provincial and Local Government.
- Landowners.
- Non-Governmental Organizations.

Emails with the updated Background Information Documents (BID) were sent to stakeholders informing them of the reapplication and the assessment of an additional corridor (Alternative 2). The location and activities being applied for have since been revised.

Comments and Response Report:

In addition to the comments and issues that will be raised during this application, the Comments and Response Report will also include the issues raised during the previous application.

G. PROCEDURE FOR THE REMAINDER OF THE STUDY

The following activities will be carried out during the finalization of the application:

- Comments from Interested and Affected Parties (IAPs) will be incorporated into the FBAR.
- Submission of the FBAR to DFFE for review and decision-making.
- Stakeholders will get written notice of DFFE's decision and instructions on how to appeal it within the specified deadlines.

H. ENVIRONMENTAL IMPACT STATEMENT AND RECOMMENDATIONS

Cognizance is taken that the area where the corridor traverses the low mountain is pristine, rich in biodiversity and is required to meet biodiversity targets. However, there is also a need to strengthen the grid to ensure the continuous provision of a basic service to the locals thereby indirectly boosting their 'well-being' and the regional economy. The agricultural, avifauna, archaeological, aquatic, geotechnical, hydrological, paleontology, terrestrial biodiversity (inclusive of flora and fauna), visual and wetland specialists' assessments undertaken have concluded that the project is generally viable should all the mitigations measures stated be effectively implemented. In the interest of sustainable development and considering all stakeholder concerns, the specialists' recommendations, and my professional experience on related projects, I as an EAP recommend Route and Corridor Alternative 2 and Substation Alternative 3 be authorized subject to the following recommendations being included in the Environmental Authorization:

- The stipulations and provisions of the attached Environmental Management Programme on Appendix H be conveyed to and familiarized by the contractor and workers responsible for construction.
- The final powerline alignment must be inspected on foot by the avifaunal, biodiversity and heritage specialists prior to construction to ascertain if any Red Data species, avi-faunal nests, protected tree species, and archaeological objects are present.
- Permits required by Eskom SOC Ltd from other competent authorities should be acquired before the commencement of the activity.

- An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with the conditions of approval.
- A structure should be placed on the ridge to ensure that there is no need for other structures on the southern slope, as this area is very steep and sensitive (vegetation in good condition, high erosion potential).
- A vulture-friendly pole design must be utilized to avoid electrocution.
- The development footprint area should remain as small as possible and should not encroach onto surrounding areas beyond the proposed/approved route.
- Ensure that only essential activities must occur within the wetland features which are traversed by the proposed powerline route, all other non-essential activities should occur outside of the freshwater features; the wetland areas not indicated within the linear developments' footprint are off-limits to construction vehicles and personnel.
- Disturbance to the wetlands must be avoided.
- Access to the construction site should be limited to a single-entry point to minimize compaction of soils, loss of vegetation and increased erosion.
- Ensure that a Waste Management Plan is in place prior to the construction of the power lines and associated infrastructure.
- Construction activity should be restricted to the immediate footprint of the infrastructure.
- The river and associated buffers must be treated as sensitive environment areas: caution must be exercised near the watercourses.
- Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm-water discharge point(s).
- Only clear larger vegetation that will impact directly to the conductors. No total clearing of the basal layer" must be allowed in the Critical Biodiversity Areas.
- Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity.
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the power line and take immediate corrective action where invasive species are observed to establish.
- All towers must be placed at least 32m from drainage lines and streams.
- To ensure that health impacts are minimized, structures are not permitted to be constructed underneath the conductors of a distribution line (i.e., within the servitude). In addition, this fulfils safety requirements, ensuring that no person can have physical contact with a line conductor.

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amsl	Above mean sea level
CARA	Conservation of Agricultural Resources Act,
CASS	Civil Aviation Site Sensitivity
CBA	Critical Biodiversity Areas
DBAR	Draft Basic Assessment Report
DEA	Department of Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DFFE	Department of Forestry Fisheries and the Environment
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
DME	Department of Minerals and Energy
EA	Environmental Authorization
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GDP	Gross Domestic Product
HA	Hectares
IAP	Interested and Affected Parties
IBA	Important Bird Areas
IEM	Integrated Environmental Management
kV	kilo Volt
LED	Local Economic Development
LEDET	Limpopo Department of Economic Development, Environment and Tourism
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act (Act No. 107 of 1998), as amended
NEMBA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NWA	National Water Act (Act 36 0f 1998), as amended

PAOI	Project Area Of Influence
PP	Public Participation
PPP	Public Participation Process
ROW	Right of Way
SACAD	South Africa Conservation Area Database
SAHRA	South African Heritage Resources Authority
SAPAD	South Africa Protected Areas Database
SARAO	South African Radio Astronomy Observatory
WMA	Water Management Area

DEFINITIONS

1 **Affected environment:** Those parts of the socio-economic and biophysical environment impacted on by the development.

2 **Alien Vegetation:** Alien vegetation is defined as undesirable plant growth which shall include, but not be limited to; all declared category 1, 2 and 3 listed invader species as set out in the Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien shall be those plant species that show the potential to occupy in number, any area within the defined construction area and which are declared to be undesirable.

3 **Alternatives:** A possible course of action, in place of another that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following but are not limited hereto: alternative sites for development, alternative layouts or alternative designs, alternative processes, and materials. In Integrated Environmental Management, the so-called "no action" alternative may also require investigation in certain circumstances.

4 **Assessment:** The process of collecting, organizing, analyzing, interpreting, and communicating data that is relevant to some decision.

5 **Bio-regional plan:** inform land-use planning and decision-making by a range of sectors whose policies and decisions impact on biodiversity.

6 **Conservation Areas:** are areas of land not formally protected by law but informally protected by the current owners and users; and managed at least partly for biodiversity conservation.

7 **Critical Biodiversity Areas (CBA1):** are areas that are.

- Irreplaceable.
- required to meet biodiversity pattern and/or sites that are required to meet each ecological process targets; and
- natural and near-natural sites including some degraded areas.

8 **Critical Biodiversity Areas (CBA2):** these are:

- Best design selected sites.
- Areas selected to meet biodiversity pattern and/or sites that are required to meet each ecological process targets.
- Alternative sites may be available to meet targets; and
- natural and near-natural sites including some degraded areas, including areas modified by agriculture.

9 **Development:** The act of altering or modifying resources to obtain potential benefits.

10 **Ecological Support Areas (ESA1):** are areas that are natural, near natural and degraded areas supporting CBAs by maintaining the ecological processes on which CBAs depend.

11 **Ecological Support Areas (ESA2):** Areas with no natural habitat that is important for supporting ecological processes.

12 **Environment:** The external circumstances, conditions and objects that affect the existence and development of individual, organism or group. These circumstances include biophysical, social, economic, historical, cultural, and political aspects.

13 **Environment Authorization:** A written statement from the Department of Forestry, Fisheries and Environment that records its approval of a planned undertaking and the conditions of such an approval.

14 **Environmental impact:** The degree of change in environmental components resulting from the effects of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organization's activities or may be indirectly caused by them.

15 **Environmental Impact Assessment:** A process of examining the environmental effects of a proposed development.

16 **Environmental issue:** A concern felt by one or more parties about some existing, potential, or perceived environmental impact.

17 **Environmentally Sensitive Area:** An area designated in regional or local land use plans, or by a local, regional, provincial, or national government body as being sensitive to disturbance or identified by an applicant as being sensitive for some reason.

18 **Erosion:** The process by which material, such as rock or soil, is worn away or removed by wind or water.

19 **Evaluation:** The process of weighing information, the act of making value judgments or ascribing values to data to reach a decision.

20 **Hazardous substance**: Any substance that is of risk to health and safety, property, or the environment. Hazardous substances have been classified under the SANS 10228-B-The identification and Classification of Dangerous Goods and Substances'.

21 **Heritage Site:** A site that contains either archaeological artefacts, graves, buildings older than 60 years, meteorological or geological fossils, etc.

22 **Indigenous Vegetation:** refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.

23 **Integrated environmental management (IEM):** is a process of integrating environmental, Socio-economic, and cultural factors in decision making to promote sustainable development. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.

24 **Landowner:** The individual or company that owns the land through which the servitude crosses.

25 **Mitigation:** the elimination, reduction, or control of the adverse environmental effects of the project and includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation, or any other means.

26 **Monitoring Programme:** The program for observing the potential environmental effects of a project, resolving specific outstanding environmental issues, and determining the action required based on the result of these activities.

27 **National protected area** means-

a) a special nature reserve.

b) a national park; or

c) a nature reserve or protected environment-

(i) managed by a national organ of state; or (ii) which falls under the jurisdiction of the Minister for any other reason.

28 **Nature reserve** means-

(a) an area declared, or regarded as having been declared, in terms of section 23 of the National Environmental Management: Protected Areas Act, 2003, as a nature reserve; or

(b) an area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 23(2) of the National Environmental Management: Protected Areas Act, 2003, be declared as a nature reserve.

29 **No Natural Areas Remaining**: are areas without intact habitat remaining.

30 **Other Natural Areas**: are areas that still contain natural habitat but that are not required to meet biodiversity targets.

31 **Power line:** An overhead line of whatever voltage, erected for the conducting of electricity.

32 **Right of Way (ROW):** The strip of land acquired for which ESKOM has obtained the rights for construction and operation of the distribution line.

33 **Stakeholder:** A stakeholder is any group or individual that may be potentially affected by a proposed project. Stakeholders typically include elected officials, government and non-government agencies, environmental and other special interest groups, developers, educators, landowners, and members of the public.

34 **Study Area:** The area within the spatial boundaries of the scope of the environmental and socio-economic effects assessment.

35 **Substation:** A network of switching, interrupting and voltage-transforming apparatus for transferring power from the electrical transmission system to the local electrical distribution system for utilization by electrical customers.

36 **Water body:** Means a body containing water and includes dams and wetlands, whether ephemeral or permanent.

37 **Water course**: Means any river, stream and natural drainage channel whether carrying water or not.

1 INTRODUCTION

This section of the report details the information required as per Section 3(1)(a) to (c) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

Section 24 F (1) (a) of National Environmental Management Act (NEMA), Act 107 of 1998, indicates that no person may commence an activity listed or specified in terms of section 24(2)(a) or (b), except per the Environmental Authorisation (EA) issued for that activity. Eskom Distribution: Limpopo (hereinafter Eskom) has appointed DIGES Group (hereinafter DIGES) to lodge an application with the Department of Forestry, Fisheries, and the Environment (DFFE) for an Environmental Authorisation for the 132kV loop in and out power line from the T-off Makonde Sanari powerline to the proposed Mutshikili substation within Thulamela Local Municipality, Vhembe District Municipality, Limpopo Province. The proposed activities to be undertaken together with the infrastructure to be provided are listed as having detrimental impacts on the environment and as such requires that a Basic Assessment (BA) be undertaken per the NEMA Environmental Impact Assessment (EIA) Regulations, Government Notice R 326, of 2017 (hereinafter EIA Regulations, 2017 (as amended)). The following activities are therefore being undertaken as part of the BA process:

i. Identification of feasible alternatives and screening thereof.
ii. Compilation of a screening report as per the DFFE Screening Tool.
iii. Site Sensitivity Verification.
iv. Specialists Assessment.
v. Undertaking the Public Participation Process.
vi. Compilation of the Draft Basic Assessment Report and Environmental Management Programme.

1.1 Details of Environmental Impact Assessment Practitioner (EAP)

Section 13 of EIA Regulations, Government Notice No. R326 of 2017 as amended indicates that an Environment Assessment Practitioner (EAP) should be independent and have expertise in conducting Environmental Impact Assessments, including knowledge of the Act and any guidelines relevant to the proposed activity.

DIGES Group is a black-owned BBB-EE consultancy company established in 2004 that offers services in the geo-environmental sector. The company has completed many Environmental Impact Assessments for various developments. The details for the project EAP and compiler of this report are given below as per Section 3(1)(a)(i) of Appendix 1 of the EIA Regulations, 2017 as amended. Reference is also made to the CV attached in Appendix A.

Table 1-1: EAP Details

Company	**DIGES GROUP**
EAP	Brenda Makanza
Address	Building 2, Constantia Park 546, 16th Road Midrand 1685
Telephone No.	011 312 2878
E-mail	brendam@diges.co.za
Expertise	Qualification(s) BSc (Hons) Environmental Science, Professional Diploma GIS. Professional Registration SACNASP: Professional Natural Scientist EAPASA: Registered EAP Experience ▪ 18 years of experience gained through direct involvement in several conservation initiatives. ▪ Principal Environmental Consultant of DIGES Group, responsible for leading, administrating, and completing assessments on Environmental Impact Assessments, overseeing studies, and interpreting technical reports and appendices. ▪ Academic skills gained through an honours-level degree in Environmental Science & Health and Post Graduate Certificates in Integral Water Management and Geo-informatics, alongside the proficient ability to participate in the development, design, and implementation of environmental / conservation management policies and consultation initiatives actively and valuably; thereby supporting the highest standards of Environmental Management and Sustainable Development, in all undertakings.

1.2 Details of the Applicant

The details of the applicant are given in the Table below.

Table 1-2: Applicant Details

Name of Company	Eskom Holdings SOC Ltd
Physical Address	92 Hans Van Rensburg Street, Polokwane
Postal Address	P O Box 3499, Polokwane, 0700
Contact Person	Matamela Tshifhiwa
Email Address	MatameTE@eskom.co.za

1.3 Location

1.3.1 Regional Context of the Project

The project area is in the Limpopo Province, within the Thulamela Local Municipality under the jurisdiction of Vhembe District Municipality. The Limpopo Province named after the Limpopo River, is South Africa's northernmost province that borders onto Mozambique, Zimbabwe and Botswana whilst also bordering the Mpumalanga, Gauteng, and Northwest provinces. The province ranks fifth in South Africa in both surface area and population, covering an area of 125 754km². It is divided into five district municipalities and twenty-two local municipalities. One of the district municipalities is Vhembe, a Category C municipality established in 2000.

Vhembe District (DC34) is predominantly rural and is in the northern part of Limpopo Province. It shares borders with Capricorn and Mopani District municipalities in the eastern and western directions respectively. The sharing of borders extends to Zimbabwe and Botswana in the north-west and Mozambique in the southeast through the Kruger National Park. The district consists of four local municipalities: Thulamela, Makhado, Musina, and Collins Chabane, which are category B executive municipalities. The district can be accessed via N1 from Zimbabwe to Polokwane, R521 from Vivo to Pont Drift Border and R81 from Tzaneen and various district roads.

Thulamela (LIM 343) is a Category B municipality and is one of the four local municipalities comprising Vhembe District Municipality. The Local Municipality`s boundaries were altered after the Country`s Local Government Elections in 2016 when part of the area that belonged to the municipality, including the towns of Malamulele and Vuwani were incorporated into the newly formed Collins Chabane Local

Municipality. Some areas of the de-establishment of Mutale Local Municipality were incorporated into Thulamela and Musina Local Municipalities.

Thulamela borders Makhado Local Municipality in the south-west, Musina Local Municipality in the north-west, and Collins Chabane Local Municipality in the north- easterly part. The two municipalities that it borders form the Musina Makhado Special Economic Zone. The municipality area covers vast track of lands mainly tribal, and Thohoyandou is its political, administrative, and commercial centre. In terms of population, it is the second largest of all the municipalities in Limpopo Province. Reference is made to the regional map indicated in Figure 1-1.

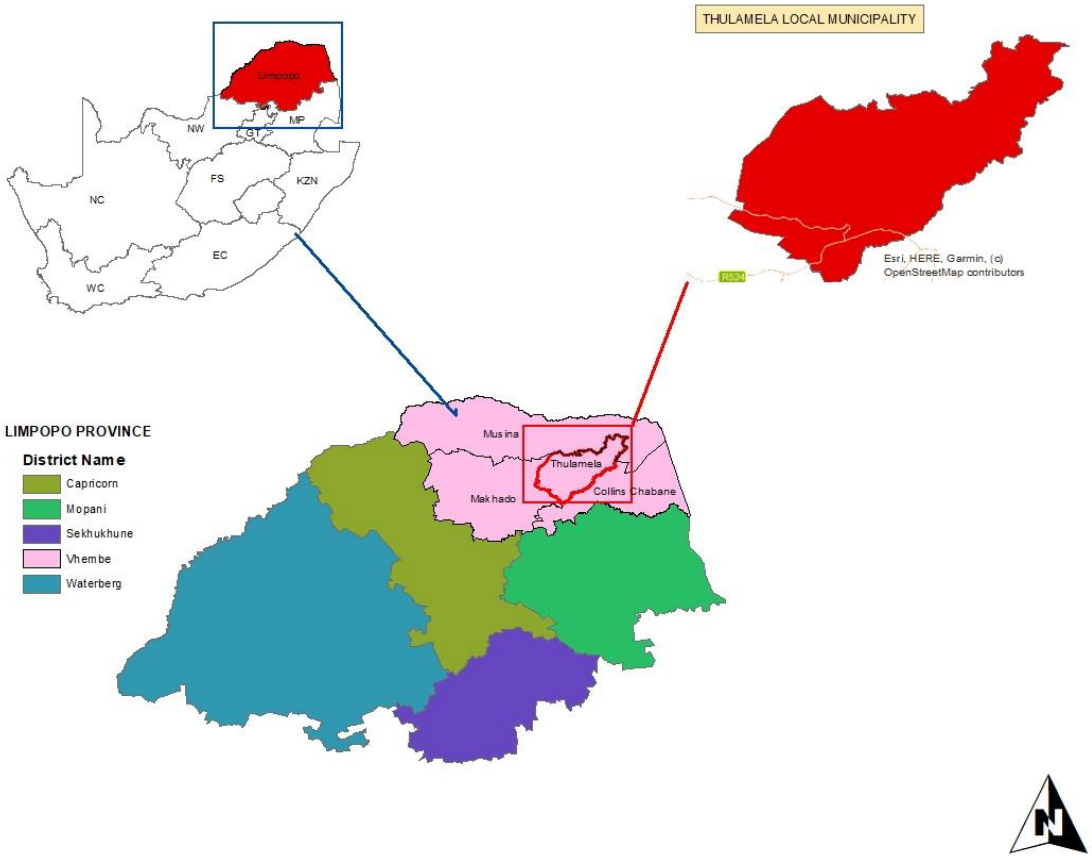


Figure 1-1: Regional Context

1.3.2 Project Location

The Project Area is located near the villages of Maheni, Thengwe Tshilavhulu and Makwilidza, and is approximately twenty-five kilometres northeast of Thohoyandou in the Limpopo Province. It falls in the southern parts of the Soutpansberg and involves flat pieces of land on opposite sides of the foothills of the Soutpansberg. The land use within the project area is largely comprised of low mountains, residential areas, and subsistence farming. The communal land is owned by the Government and is

under the control of Traditional Authorities. Reference is made to Table 1-3 below for the farm details and land use:

Table 1-3: Project Location Information

Province	Limpopo
District Municipality	Vhembe
Local Municipality	Thulamela
Ward No.	4 and 5
Farms and SG 21 digits	Tengwe's Location 255MT, T0MT00000000025500000 Portion 3 of Tengwe's Location MT, T0MT00000000025500003 Maheni 419 MT, T0MT00000000041900000 Remainder of Farm 439 MT, T0MT00000000043900000 Farm 444 MT, T0MT00000000044400000 Farm 445 MT, T0MT00000000044500000 Farm 476MT, T0MT00000000047600000
Erven (within Corridor 1)	**Maheni Village**: Erf 3- 10, 14-43, 47-48 **Thengwe- Thondoni**: Erf 31-32, 43-47
Closest towns and Settlements	Thohoyandou, Tswera, Maheni, Tshihlavulu, Tshilamba, Thengwe
Surrounding land-uses	Subsidence agriculture, Settlements, Wilderness

1.4 A description and coordinates of the corridor

The corridor and substation alternatives are in wards 4 and 5 with the corridors traversing across farms Tengwe's Location 255MT, 3/255MT, 439 MT, 444 MT, 476MT and 445MT. The erven indicated in Table 1-3 are within Corridor 1. The four proposed Mutshikili Substation alternatives are located on Tengwe Location 255 and accessed via a dirt road that links Thengwe and Maheni villages. The T-off point from the Makonde-Sanari power line is located on farm 444MT near Tswera and Tshivhase villages. The project area is rural characterized by subsistence agricultural land and villages. Access to the T-off is via village streets. The location of the corridors and related infrastructure is indicated in the Figure 1-2, the coordinates for the four substation alternatives, the start, mid and end coordinates, and the 250m interval coordinates for the two routes are shown in Table 1-4, Table 1-5 and Table 1-6.

Table 1-4: Substation Coordinates

Name	Latitude [S]	Longitude [E]
Substation Alternative 1		
Centre	22° 42' 54,834" S	30° 34' 30,255" E
A	22° 42' 57,565" S	30° 34' 32,145" E
B	22° 42' 55,726" S	30° 34' 26,486" E
C	22° 42' 52,116" S	30° 34' 28,336" E
D	22° 42' 53,892" S	30° 34' 34,023" E
Substation Alternative 2		
Centre	22° 43' 0,580" S	30° 34' 20,999" E
A	22° 43' 1,719" S	30° 34' 17,146" E
B	22° 42' 57,407" S	30° 34' 19,423" E
C	22° 42' 59,280" S	30° 34' 24,767" E
D	22° 43' 3,771" S	30° 34' 22,862" E
Substation Alternative 3 (Preferred)		
Centre	22° 42' 48,409" S	30° 34' 13,475" E
A	22° 42' 51,623" S	30° 34' 15,149" E
B	22° 42' 49,540" S	30° 34' 9,641" E
C	22° 42' 45,228" S	30° 34' 11,919" E
D	22° 42' 47,100" S	30° 34' 17,262" E
Substation Alternative 4		
Centre	22° 42' 59,675" S	30° 34' 12,752" E
A	22° 42' 56,517" S	30° 34' 11,141" E
B	22° 42' 58,354" S	30° 34' 16,543" E
C	22° 43' 2,876" S	30° 34' 14,430" E
D	22° 43' 0,793" S	30° 34' 8,922" E

Table 1-5: Route Summary

	Route Option 1	Route Option 2 (Preferred)
Start (T-Off Point)	22° 45' 0,760" S 30° 36' 54,080" E	22° 45' 24,345" S 30° 35' 44,377" E
Mid-point	22° 43' 30,626" S 30° 35' 56,144" E	22° 43' 41,572" S 30° 35' 33,467" E
End (Substation Alternative 3-Preferred)	22° 42' 48,409" S 30° 34' 13,475" E	22° 42' 48,409" S 30° 34' 13,475" E
Length	6.7 km	7.3 km

Table 1-6: Coordinates at 250m intervals

Distance (m)	Route Option 1		Route Option 2 (Preferred)	
	Latitude (S)	Longitude (E)	Latitude (S)	Longitude (E)
Makonde T-Off Point	22° 45' 0,760" S	30° 36' 54,080" E	22° 45' 24,345" S	30° 35' 44,377" E
250	22° 44' 53,867" S	30° 36' 49,459" E	22° 45' 17,122" S	30° 35' 40,386" E
500	22° 44' 46,972" S	30° 36' 44,842" E	22° 45' 9,898" S	30° 35' 36,395" E
750	22° 44' 40,077" S	30° 36' 40,225" E	22° 45' 2,664" S	30° 35' 32,427" E
1000	22° 44' 33,182" S	30° 36' 35,608" E	22° 44' 55,427" S	30° 35' 28,464" E
1250	22° 44' 26,288" S	30° 36' 30,991" E	22° 44' 48,327" S	30° 35' 24,224" E
1500	22° 44' 19,393" S	30° 36' 26,374" E	22° 44' 41,360" S	30° 35' 19,746" E
1750	22° 44' 11,955" S	30° 36' 22,874" E	22° 44' 34,559" S	30° 35' 14,970" E
2000	22° 44' 4,115" S	30° 36' 20,610" E	22° 44' 27,724" S	30° 35' 10,251" E
2250	22° 43' 56,279" S	30° 36' 18,333" E	22° 44' 20,888" S	30° 35' 5,533" E
2500	22° 43' 48,813" S	30° 36' 14,900" E	22° 44' 14,177" S	30° 35' 9,759" E
2750	22° 43' 41,105" S	30° 36' 12,481" E	22° 44' 7,476" S	30° 35' 14,697" E
3000	22° 43' 35,556" S	30° 36' 8,810" E	22° 44' 0,734" S	30° 35' 19,568" E
3250	22° 43' 32,839" S	30° 36' 0,585" E	22° 43' 53,973" S	30° 35' 24,410" E
3500	22° 43' 27,709" S	30° 35' 54,402" E	22° 43' 47,265" S	30° 35' 29,336" E
3750	22° 43' 21,868" S	30° 35' 48,690" E	22° 43' 40,531" S	30° 35' 34,222" E
4000	22° 43' 18,332" S	30° 35' 40,887" E	22° 43' 33,808" S	30° 35' 39,123" E
4250	22° 43' 15,607" S	30° 35' 32,646" E	22° 43' 27,111" S	30° 35' 44,067" E

Distance (m)	Route Option 1		Route Option 2 (Preferred)	
4500	22° 43' 12,881" S	30° 35' 24,404" E	22° 43' 20,058" S	30° 35' 44,645" E
4750	22° 43' 10,156" S	30° 35' 16,163" E	22° 43' 16,888" S	30° 35' 36,591" E
5000	22° 43' 7,430" S	30° 35' 7,922" E	22° 43' 13,718" S	30° 35' 28,536" E
5250	22° 43' 4,704" S	30° 34' 59,680" E	22° 43' 10,830" S	30° 35' 20,363" E
5500	22° 43' 1,978" S	30° 34' 51,439" E	22° 43' 8,095" S	30° 35' 12,125" E
5750	22° 42' 59,139" S	30° 34' 43,243" E	22° 43' 5,360" S	30° 35' 3,888" E
6000	22° 42' 56,204" S	30° 34' 35,086" E	22° 43' 2,844" S	30° 34' 55,570" E
6250	22° 42' 53,269" S	30° 34' 26,929" E	22° 43' 0,346" S	30° 34' 47,245" E
6500	22° 42' 50,334" S	30° 34' 18,772" E	22° 42' 57,634" S	30° 34' 39,010" E
6750			22° 42' 54,242" S	30° 34' 31,062" E
7000			22° 42' 51,144" S	30° 34' 22,980" E
7250			22° 42' 48,246" S	30° 34' 14,807" E
Preferred Substation Alternative 3	22° 42' 48,409" S	30° 34' 13,475" E	22° 42' 48,409" S	30° 34' 13,475" E

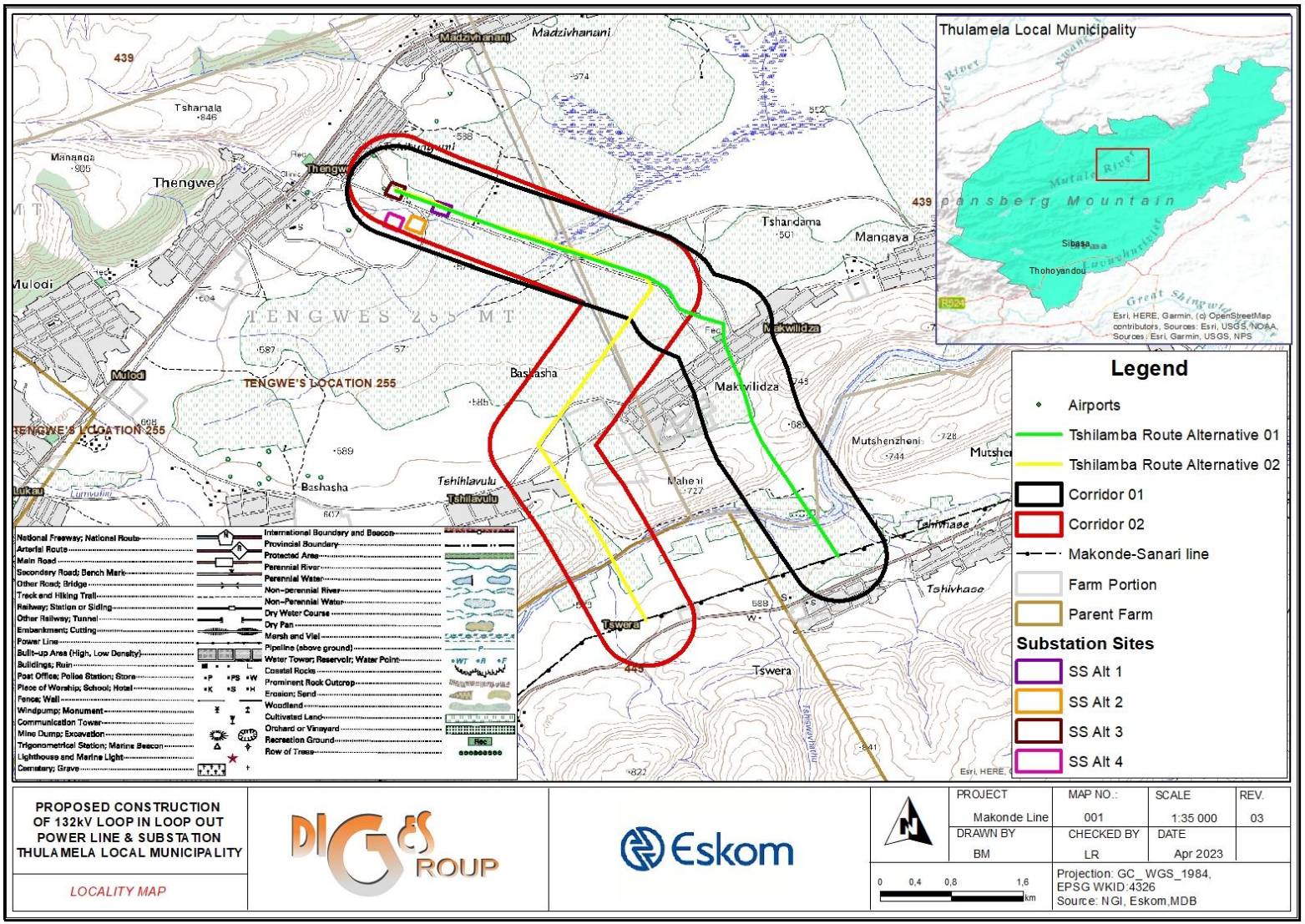


Figure 1-2: Locality Map

2 PROJECT DESCRIPTION

This section of the report details the information required as per Section 3(1)(d) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

2.1 Project Background

Eskom Distribution: Limpopo (hereinafter referred to as Eskom) proposes to build the Mutshikili Substation, with a project footprint of approximately 100m by 100m, as well as a 132kV loop in loop out power lines, approximately seven (±7) kilometres in length, extending from the Makonde- Sanari Powerline to the proposed Mutshikili substation within Thulamela Local Municipality, to fulfil their mandate of providing a high-quality supply of electricity to support annual load growth and improve the operational flexibility of the existing electricity network The proposed project was previously issued an Environmental Authorization (Ref No.: 14/12/16/3/3/1/2122) in 2011, but owing to unanticipated events, the Environmental Authorization expired before work could start. As a result, DIGES Group submitted a new application in 2018/19, DEA Ref. 14/12/16/3/3/1/2122, for a two-kilometre powerline corridor and two alternative substation sites.

Although the spatial data sourced from the Department of Environment, Forestry, Fisheries, and the Environment (DFFE) regarding, conservation areas indicated that the project was within a protected area, the Final Basic Assessment Report (FBAR) did not attach comments from the Conservation Area Management Authority, Limpopo Department of Economic Development, Environment and Tourism (LEDET), leading to the issuance of a negative authorization. A successful appeal against this judgment was filed, however because the necessary documentation was not submitted in a timely manner, a new application was necessary. On the 28th of July 2022, an application (DFFE Reference No.: 14/12/16/3/3/1/2596) was submitted with a Draft Basic Assessment Report (DBAR). However, water ingress was noted at the preferred substation (Alternative 1) during the public review period as such two additional substations (Alternative 3 and Alternative 4) were therefore identified for assessment. The Final Basic Assessment Report (FBAR), however, could not be submitted within the prescribed 150 days hence the application was withdrawn on the 23rd of November 2022.

A new application is being lodged and this DBAR is being submitted as part of the new application for Environmental Authorization for the construction and operation of:

i. ±7km, 2 x 132kV loop in and out powerlines from the Makonde-Sanari line to the new Mutshikili 132/22kV 2x20MVA substation at Tswera/Thengwe village.
ii. Mutshikili 132/22kV substation. The structure will also comprise the following components:
    - 132kV Line bays.
    - sectionalized 132kV tubular busbar.

- 2 x 20MVA 132/22kV Transformers.
- Linear 22kV busbar.
- 3 x 22kV feeder bays (outdoor MV Box structure configuration).
- 2 x future 22kV feeder bays (busbar only, no equipment).
- Build a standard control room to house all secondary equipment.
- Build a palisade fence around the substation.
- 15 m communication mast.

iii. Construction of a 6 m wide road from the gravel road to the proposed substation. The length of the road is approximately ±200 m measured from the gravel road.

The proposed activities to be undertaken together with the infrastructure to be provided trigger activities incorporated in Listing Notices 1 and 3 according to National Environmental Management Act 107 of 1998: Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017(as amended). The list of triggered activities and their applicability are indicated in the Table below:

Table 2-1: List of triggered activities

Relevant Government Notice	Activity	Description	Applicability
GNR 327	11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	Construction of a ±7km, 132 kV loop in loop out powerline in a rural area within Thulamela Local Municipality.
GNR 327	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	The infilling of Mulondi and Mutale Rivers by approximately ±12 m^3 of material during construction.
GNR 327	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	Clearing of approximately 1 ha of indigenous vegetation for the construction of the Mutshikili substation. Of note is the total site footprint of 2.5ha.
GNR324	4 (e) (i) (gg)	The development of a road wider than 4 metres with a reserve less than 13,5	The construction of the substation access road within 5km of Thengwe Nature

Relevant Government Notice	Activity	Description	Applicability
		metres. e. Limpopo i. Outside urban areas: (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas	Reserve. The road will branch off from the existing gravel road to the new Mutshikili substation and will be ±6m wide and ±200m long.
GNR 324	12e(ii)(iii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans	Clearing of approximately 2700m^2 of indigenous vegetation within areas classified as CBA1 and CBA2 in the Draft Vhembe Bioregional Plan and the 2018 Limpopo CBA map.
GNR 324	14(ii) (c) (e) (i) (ff) (hh)	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (c) if no development setback has been adopted, within 32metres of a watercourse, measured from the edge of a watercourse; e. Limpopo i. Outside urban areas (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;	The cumulative footprint for the towers that will be constructed within 32m of the Mutale, Mulondida and wetlands that are within CBA, ESA and within 5km of Thengwe Nature Reserve, is more than 10 square meters.

2.2 Technical Details of the Project

2.2.1 Requirements for the 132kV Power line

The technical requirements for a 132kV power line are discussed in the Sections below.

Table 2-1: Technical Details

Component	Description/dimensions
Power line	
Power line capacity	132kV
Pylon type	7611: Intermediate mono pole structure 7615: Guyed mono pole strain structure 7618 3-Pole Strain
Height of pylon	16m-24m
Span Length	300m-400m
Minimum Ground Clearance	6.7m
Length	±7km
Servitude	48m
Area occupied by laydown areas	To be determined during construction by the contractor in consultation with the ECO
Substation	
Substation Capacity	132/22kV
Development Footprint	100m x 100m
Width of the access road	Servitude to be used for access. Where there is a need, a ±6m wide road will be used.
Length of the access road	An existing road will be upgraded and utilized as access.
Height of fencing	2.1m
Type of fencing	Palisade

2.2.1.1 Line Height and Servitude width

The statutory minimum ground clearance for a 132kV overhead line is 6.7m. The line must be designed to afford this clearance in ALL circumstances. The overall height of the line is also dependent on several criteria, including geographical location, topography, height above sea level, span length and conductor type. The servitude width required for a 132kV distribution line is 31 m (i.e., 15.5 m on either side measured from the center line of the powerline), however 48m servitude is required for a loop in loop out 132kV power line is 48m.

2.2.1.2 Minimum Clearance Distances

For safety reasons (as set out in regulations of the Occupational Health and Safety Act), the distribution line requires minimum clearance distances. These are summarized as follows:

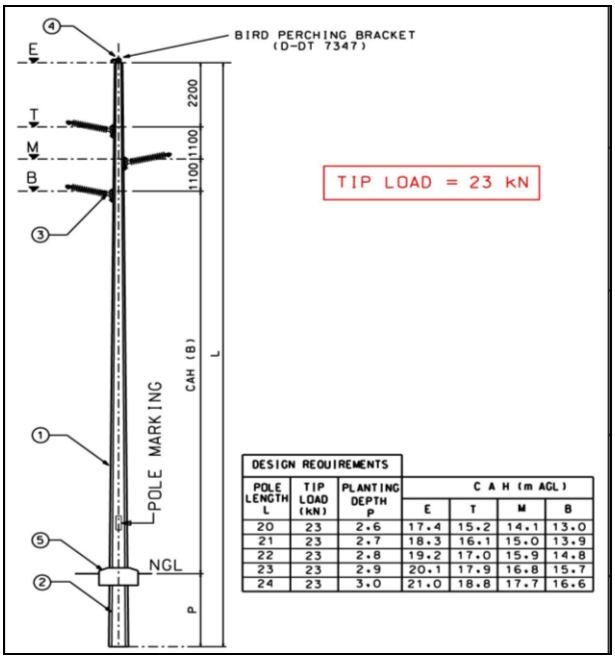
i. The minimum vertical clearance distance between the ground and power line conductors is 8.1 m;
ii. The maximum crop height permitted within the servitude is 4.3 m;
iii. The minimum vertical clearance to any fixed structure that does not form part of the power line is 5.6 m;
iv. The minimum safe distance required from the centre of the power line to the edge of a domestic house is 40 – 50 m.
v. Farming activity, except for sugarcane and commercial forestry, can be practised under the conductors, provided that there is adherence to safe working clearances, crop height restrictions and building restrictions.

2.2.1.3 Span Length

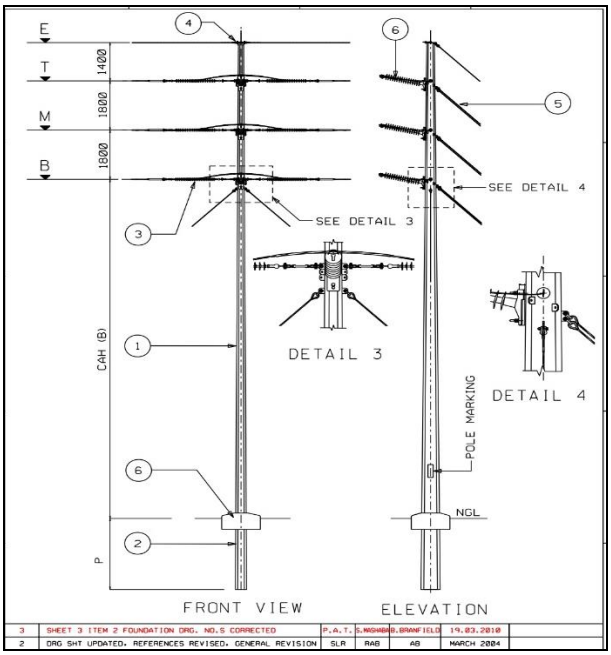
The span length also depends on the same criteria as line height. The distance between supports (span length) will vary from 300 to 400m, with an average span of 350m between supports.

2.2.1.4 Towers

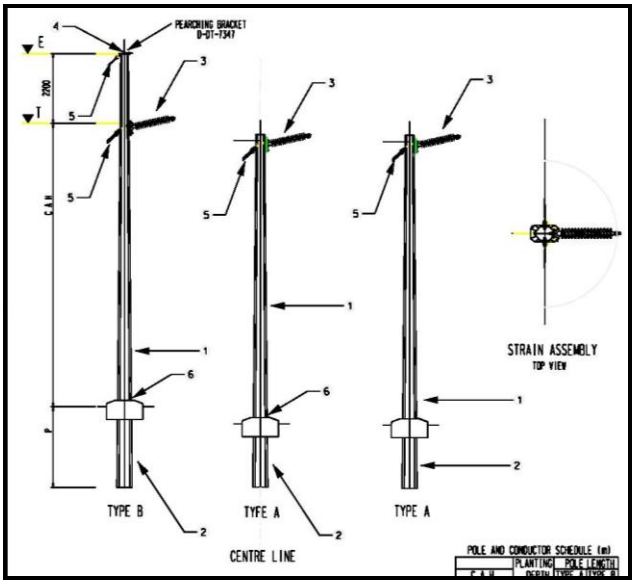
Steel towers will be constructed at intervals along the route of the distribution line at a spacing of approximately 300 - 400 m. The towers being considered are indicated below, with heights ranging from 17-24m. The final towers to be used will be determined after surveying and profiling the line.



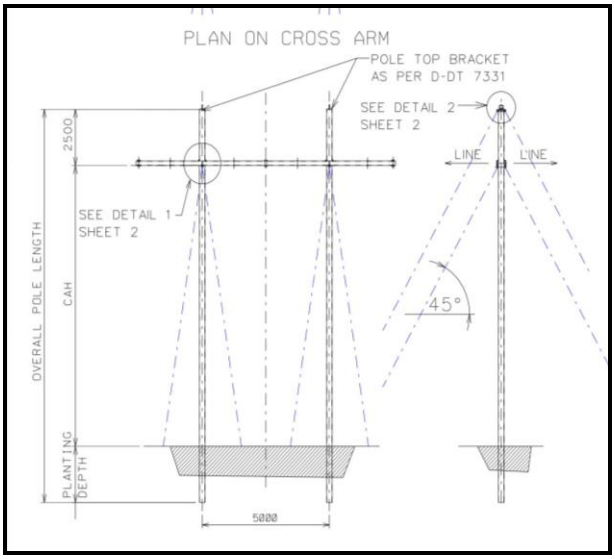
7611: Intermediate mono pole structure



7615: Guyed mono pole strain structure



7618: 3-Pole Strain



7812: 132kV H-Pole Structures

Figure 2-1: Towers being considered.

2.2.1.5 Service Access Roads

Temporary access routes capable of accommodating the construction plant, material and workers are required to construct each tower and install conductors. The cleared powerline servitude will be used for access.

2.3 Pre-construction and Construction Phase

The main works for the construction of the 132kV power lines and substation upgrade include the following:

2.3.1 Pre-Construction

2.3.1.1 Land Negotiation

132kV power lines are constructed and operated within a servitude that is established along the entire length of the line. Within this servitude, Eskom has certain rights and controls that support the safe and effective operation of the line. These include:

(i) Access to erect a distribution line along a specific agreed route;
(ii) Reasonable access to operate and maintain the line inside the servitude area;
(iii) The removal of trees and vegetation that will interfere with the operation of the power line.

Eskom is responsible for the servitude negotiation process undertaken after a route has been environmentally authorized by DFFE. This process must be completed with the relevant landowners before construction starts on that property.

2.3.1.2 Right of Way Surveying

Before the overhead power line is constructed, a thorough ground survey is carried out to determine the ground profile along the centre of the power line route and where the ground profile slopes across the power line route. This is to ensure that the location selected for towers and stays and their relationship with each other comply with the technical limits. Further consideration is given to detailed environmental effects. Where the line route passes over or near trees that could infringe safe clearances to 'live' conductors, the trees must be felled or pruned before the line's construction.

2.3.1.3 Soil sampling

Geotechnical investigations will be carried out at tower positions to determine the type of foundation required. The holes will be filled in after soil sampling is completed.

2.3.1.4 Structure Stacking

A survey crew will peg the substation location and the power lines servitude.

2.3.2 Construction Phase

The construction of the line and substation is expected to require 15-18 months to complete. The sequence of construction activities is listed below and briefly discussed in the following sections:

- Construction campsite and laydown area establishment.
- Servitude gate installation to facilitate access to the servitude.
- Vegetation clearing to facilitate access, construction, and the safe operation of the infrastructure.
- Establishing access roads on the servitude where required.
- Preparation for construction right-of-way and ground preparation.
- Pegging of tower positions for construction.
- Transportation of equipment, materials and personnel to sites and stores.
- Installation of foundations for the towers.
- Tower assembly and erection.
- Conductor stringing and regulation.
- Transfer of the line from the Contractor for commissioning.
- Final inspection of the line, commissioning and transfer to the Grid Line and Servitude Manager for operation.
- Rehabilitation of disturbed areas.
- Signing off Landowners on acceptability of the rehabilitation upon completion of the construction and rehabilitation.
- Transfer of the servitude by the Grid Environmental Manager; and
- Operation and maintenance of the infrastructure.

2.3.2.1 Construction Camp

The establishment of the construction camp will involve the clearing of vegetation, fencing of the camp and the construction of workshops and storerooms as well as temporary site offices. The location is selected by the contractor who will consider such aspects as access to the construction site, access to services, access to materials, etc. The contractor will then agree with a landowner for the establishment of the construction camp.

2.3.2.2 Clearing

The Right of Way (ROW) must be cleared to allow for construction and operation activities of the power line; hence the landowners will be notified before construction clearing.

2.3.2.3 Access Road Construction

Where construction of a new road has been agreed upon, the road width shall be determined by need, such as equipment size, and shall be no wider than 6m. The proposed servitude will also be used to access each tower location.

2.3.2.4 Foundation Installation

A work crew will excavate the foundations for the tower structures and the foundation is influenced by the terrain encountered and the underlying geotechnical condition. The actual size and type of foundation to be installed will depend on the soil bearing capacity and can be excavated manually or by using machines. The foundations will be backfilled, stabilized through compaction, and capped with concrete.

2.3.2.5 Erecting structures and stringing Conductors

The Right of Way corridor may be used as an area for temporary storage and handling of equipment and materials related to construction. Steel components of structures may be delivered and placed on the ground near foundation sites. Once foundations are in place, the erection of the structures within the Right of Way will be done.

2.3.3 Substation Construction

The construction of a substation typically consists of, but is not limited to the following sequence of activities:

- Cut and fill grading.
- Placement and compaction of structural fill to serve as a foundation for equipment.
- Grading to maintain drainage patterns.
- Oil spill containment facilities.
- Crushed rock surface yard, parking areas and roads.
- Fencing and gating.
- Landscaping with native plants where applicable.
- Installation of equipment and structure foundations.
- Installation of structures and equipment.
- Installation of bussing materials.

- Installation of control shelter.
- Installation of control and relaying equipment and wiring

2.4 Bulk Services and Infrastructure

The supply of the following basic services forms part of the contract between Eskom and the contractor hence the agreements will be acquired by the contractor. The proposed services are indicated below:

i. **Water**: This report has not quantified the expected volume of water required for the construction and operational phases of this project. A general authorization may be required if the water used for construction is sourced from the Vaal River where the abstracted quantities are more than what is permissible within the quaternary catchment.

ii. **Sewerage:** Sewerage generation is anticipated during the construction phase due to the presence of the workforce contracted for the project. Consequently, the use of portable chemical toilets is suggested, which will be serviced periodically.

iii. **Stormwater:** Storm-water measures will be implemented to suit the terrain. The measures to be implemented are detailed in the Environmental Management Programme attached in Appendix G.

iv. **Solid Waste:** It is anticipated that solid waste will be produced mostly in the construction phase such as litter, packaging materials such as plastics, carton boxes, paper, beverages, and stockpiles. This type of waste will not pose any threat to the proposed project and will not require a Waste Management License. The contractor will be required to compile a Waste Management Method Statement before the commencement of construction activities.

2.5 Operation and Maintenance of the Power line

The management of a distribution line servitude depends on the details and conditions of the agreement between the landowner and Eskom and is, therefore site-specific. These may, therefore, vary from location to location. However, it is common that there is a dual responsibility for the maintenance of the servitude and Eskom will be responsible for the tower structures, access roads, and roads relating to servitude access.

2.5.1 Land Use and Power Line Operation

Literature studies have shown that farming and associated infrastructure such as irrigation systems and support structures, can be practiced under 132 kV power lines provided that all the safe working clearances, crop height restrictions and building restrictions are properly followed. However, there is also a need for the landowner to have an agreement with Eskom concerning the activities that can be carried out underneath the servitude. The following activities are generally allowed:

- **Livestock grazing:** Bush clearing in the servitude will have little impact on the grazing potential of the land because most of the vegetation can be re-established under servitude. Overhead power lines do not affect the behavior of livestock health; therefore, they can continue to feed underneath the power line once the cleared vegetation becomes re-vegetated; and
- **Overhead power lines** do not affect the growth of any crops and other low-growing vegetation. Tree height should not exceed the minimum height restriction.

3 ADMINISTRATIVE, LEGAL AND POLICY REQUIREMENTS

This section of the report details the information required as per Section 3(1)(e) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

Environmental laws are formulated to realize sustainable development strategies, preventing adverse impacts on the environment from implementing plans and construction projects and promoting coordinative development of the economy, society, and environment. Most developments are regulated by legislation, with the Constitution of the Republic of South Africa and the National Environmental Management Act (NEMA) being the cornerstone of environmental law. The aim of the legislation is to incorporate both human rights and sustainable development in terms of the environment. The following laws, principles and regulations have been formulated to promote environmental sustainability and that are relevant to this project are discussed below:

3.1 The Constitution of the Republic of South Africa

Section 24 of the Constitution of South Africa guarantees basic human rights and provides guiding principles for society. The environmental rights in the constitution state:

"Everyone has the right –

a) to an environment that is not harmful to their health or well-being; and
b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that -
    (i) prevent pollution and ecological degradation.
    (ii) promote conservation.
    (iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."

Based on this section, there is a need to ensure that the assessment of this project will consider the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option.

The Bill of Rights in Chapter 2 of the Constitution entrenches the right to information, freedom of expression, participation in political activity, administrative justice and fundamental science, cultural, legal, economic, and environmental rights. In addition, the Constitution requires all legislature to facilitate public involvement in the legislative and other policy processes. Citizens have the right to engage in public initiatives and processes on an ongoing basis. Based on the Bill of Rights, the public will access all information developed and compiled during the Basic Assessment process.

3.2 National Environmental Management Act (Act No. 107 of 1998)

The National Environmental Management Act (NEMA) aims to improve the quality of environmental decision-making by setting out principles for environmental management that apply to all government departments and organisations that may affect the environment. NEMA also creates a framework for facilitating the role of civil society in environmental governance (see below).

The Principles of National Environmental Management state that - (DEAT 1998b)

- Environmental management must place people and their needs at the forefront of its concern.
- Development must be socially, environmentally, and economically sustainable.
- Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
- Environmental justice must be pursued.
- Equitable Services Access to environmental resources to meet basic human needs and ensure human well-being must be pursued.
- Responsibility for the environmental health and safety consequences of a project or activity must exist throughout its life cycle.
- The participation of all interested and affected parties in environmental governance must be promoted.
- Decisions must consider the interests, needs and values of all interested and affected parties.
- The social, economic, and environmental impacts of activities must be considered, assessed, and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
- Decisions must be taken in an open and transparent manner, and Services Access to information must be provided in accordance with the law.
- The environment is held in public trust for the people, the beneficial use of which environmental resources must serve the public interest and the environment must be protected as the people's common heritage.
- The costs of remedying pollution, environmental degradation and consequent adverse health effects must be paid for by those responsible for harming the environment.
- Sensitive, vulnerable, highly dynamic, or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

3.2.1 Environmental Impact Assessment (EIA) Regulations

EIA Regulations [GNR982 as amended)/ GNR326] published terms of sections 24(5) and 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998), makes provision for two types or levels of assessment, namely Basic Assessment and Scoping and EIA. The EIA Regulations, 2017 (as

amended) specify that all activities that appear in Listing 1[GN No. R. 983 (as amended)/GNR 327] and Listing 3 [GN No. R. 985 (as amended)/GNR 324] require a Basic Assessment. As the proposed development triggers activities in Listing Notice 1 (GNR 327) and Listing Notice 3 (GNR324), a Basic Assessment process will be followed with the application being lodged with the DFFE. The listed activities being applied for are indicated in the table below:

Table 3-1: Triggered Activities

Relevant Government Notice	Activity	Description	Applicability
GNR 327	11	The development of facilities or infrastructure for the transmission and distribution of electricity— (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	Construction of a ±7km, 132 kV loop in loop out powerline in a rural area within Thulamela Local Municipality.
GNR 327	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	The infilling of Mulondi and Mutale Rivers by approximately ±12 m^3 of material during construction.
GNR 327	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	Clearing of approximately 1 ha of indigenous vegetation for the construction of the Mutshikili substation. Of note is the total site footprint of 2.5ha.
GNR324	4 (e) (i) (gg)	The development of a road wider than 4 metres with a reserve less than 13,5 metres. e. Limpopo i. Outside urban areas: (gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas	The construction of the substation access road within 5km of Thengwe Nature Reserve. The road will branch off from the existing gravel road to the new Mutshikili substation and will be ±6m wide and ±200m long.
GNR 324	12e(ii)(iii)	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous	Clearing of approximately 2700m^2 of indigenous vegetation within areas classified as CBA1 and CBA2 in the Draft

Relevant Government Notice	Activity	Description	Applicability
		vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Limpopo within critical biodiversity areas identified in bioregional plans	Vhembe Bioregional Plan and the 2018 Limpopo CBA map.
GNR 324	14(ii) (c) (e) (i) (ff) (hh)	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (c) if no development setback has been adopted, within 32metres of a watercourse, measured from the edge of a watercourse; e. Limpopo i. Outside urban areas (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans. (hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve;	The cumulative footprint for the towers that will be constructed within 32m of the Mutale, Mulondida and wetlands that are within CBA, ESA and 5km of Thengwe Nature Reserve, is more than 10 square meters.

3.2.2 Integrated Environmental Management (IEM)

According to DEAT, 2004, IEM provides a holistic framework that can be embraced by all sectors of society for the assessment and management of environmental impacts and aspects associated with an activity for each stage of the activity life cycle, taking into consideration a broad definition of environment and with the overall aim of promoting sustainable development. The following series of IEM Guidelines were therefore used during the entire EIA process:

- Stakeholder Engagement, Integrated Environmental Management, Information Series 3.
- Specialists Studies, Integrated Environmental Management, Information Series 4.
- Impact Significance, Integrated Environmental Management, Information Series 5.
- Ecological Risk Assessment, Integrated Environmental Management, Information Series 6.
- Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.

- ❑ Criteria for determining alternatives, Integrated Environmental Management, Information Series 11.
- ❑ Guideline on need and desirability (2017)

3.3 Other Relevant Legislation

In addition to the two laws indicated above, the following laws, regulations, and documents in Table 3-2 also have relevance to the project:

Table 3-2: Legislative Framework

International Conventions	
The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal It was adopted in 1989, and it came into force in 1992. The Convention is the most comprehensive global environmental agreement on hazardous and other waste. It is a global control system for importing and exporting hazardous waste, and the framework: • Improves how hazardous waste is managed. • Helps prevent harmful impacts on the environment and human health. **United Nations Sustainable Developmental Goals (SDGs)** The 2030 Agenda for Sustainable Development, adopted by all United Nations Member States in 2015, provides a shared blueprint for peace and prosperity for people and the planet, now and into the future. At its heart are the 17 Sustainable Development Goals (SDGs), which are an urgent call for action by all developed and developing countries in a global partnership. They recognize that ending poverty and other deprivations must go together with strategies that improve health and education, reduce inequality, and spur economic growth – all while tackling climate change and working to preserve our oceans and forests. The proposed project contributes to SDG 7, which ensures access to affordable, reliable, sustainable, and modern energy. Energy is crucial for achieving almost all the Sustainable Development Goals, from its role in eradicating poverty through advancements in health, education, water supply and industrialization, to combating climate change.	
SPECIFIC ENVIRONMENTAL MANAGEMENT ACTS	
National Environmental Biodiversity Act (Act 10 of 2004)	**Administering Authority:** National and Provincial
The Act sets out the mechanisms for managing and conserving South Africa's biodiversity and its components; protecting species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting, including indigenous biological resources. Some of the lists that have been promulgated in terms of various sections of the Act are: i. GN 1003 of 18 September 2020: Alien and Invasive Species Lists, 2020 ii. GN 2747 of 18 November 2022: The revised National list of ecosystems that are threatened and in need of protection. Categories are defined as Critically Endangered, Endangered, Vulnerable, and Protected,	

depending on their ecological structure, function, and composition.

The primary implication of the Revised National List of Ecosystems that are Threatened or in need of Protection is that it is linked to Listing Notice 3 published under the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). The ecosystem within the project area is not classified as threatened; hence no activity has been applied for in terms of Listing Notice 3. Mitigation measures have been recommended for the conservation of biodiversity.

National Environmental Management: Air Quality Act (Act No. 39 of 2004)	**Administering Authority:** Municipalities

The Act has introduced prescribed standards to protect and enhance air quality and pollution prevention in South Africa. This includes the National Ambient Air Quality Standards (AAQ Standards), which set ambient air quality standards for sulphur dioxide (SO2), nitrogen dioxide (NO2) and particulate matter, amongst other priority pollutants. In addition, the Minister has published the National Dust Control Regulations in the gazette for controlling dust in all areas (Government Gazette No.36974, Notice No.827 of 01 November 2013), including the requirements for monitoring, dust management plan development and implementation and reporting.

Mitigation measures have been recommended to ensure the minimisation of dust emissions during construction.

National Environmental Management: Waste Act 59 of 2008	**Administering Authority:** All Spheres

NEMWA sets out to protect health and the environment in terms of the constitutional right to have an environment that is not harmful to health and well-being, and to protect the environment for the benefit of present and future generations while promoting justifiable economic development. This is to be achieved through measures including uniform application of strategies throughout the Republic as well as norms and standards which seek to ensure best waste practices within a system of co-operative governance to achieve:

- prevention of pollution and ecological degradation through institutional arrangements, planning and standards for regulating waste management by all spheres of government.
- remediation of contaminated land
- implementation of the national waste information system
- compliance and enforcement.

Section 26 and 27 prohibits unauthorised disposal and littering. Mitigation measures have therefore been recommended to address waste management.

WATER

National Water Act (Act No. 36 of 1998)	**Administering Authority:** DWS

The Act seeks to ensure that the country's water resources are protected, used, developed, conserved, managed, and controlled in a manner that considers relevant factors such as meeting the basic human needs of present and future generations. In terms of Section 19(1) an owner of land or a person in control of land where any activity or process is or was performed or undertaken or where any situation exists must take all reasonable measures to ensure that which causes, has caused, or is likely to cause pollution of a water resource, must take all appropriate measures to prevent any such pollution from occurring, continuing, or recurring. Section 19(2) further indicates that measures must be undertaken to cease or modify the activity, comply with any waste standard or management practice, or eliminate the source of pollution. It further clarifies what is termed water use, and these 11 waters uses, as specified in Section 21, require a license/ General Authorization/ Water Use License.

A General Authorisation/ Water Use Licence is required per Section 21(c) and (i) of the Act since the preferred route alternative is within 500m of delineated wetlands.
HERITAGE
National Heritage Resources Act (Act No. 25 of 1999) | **Administering Authority:** SAHRA and Provincial
This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations. The National Heritage Resources Act (NHRA) has introduced an integrated system for the identification, assessment, and management of the heritage resources of South Africa. The NHRA makes provision for the general protection of heritage resources: • Section 34 in respect of the built environment. • Section 35 in respect of archaeology, palaeontology, and meteorites; and • Section 36 in respect of graves and burial grounds. Section 38 sets out guidelines for Heritage Resources Management and the conditions under which heritage impact assessments are required when developments impact upon heritage resources. If the appropriate authority permits the disturbance, the impacts on heritage resource/s affected must be mitigated to ensure the recovery and recording of information about that site. The screening tool has indicated the sensitivity of Palaeontology and Cultural Heritage to be medium and low, respectively. An archaeologist has been commissioned to assess the significance of the project's impacts on archaeological and palaeontological resources.
AGRICULTURE
Conservation of Agricultural Resources Act (Act No. 43 of 1983) | **Administering Authority:** Department of Agriculture, Forestry and Fisheries
The Conservation of Agricultural Resources Act ([CARA] Act 43, 1983) provides for the: ○ Protection of wetlands; and ○ Requires the removal of listed alien invasive species. This Act also requires that any declared invader species on Eskom land must be controlled according to their declared invader status.
ENERGY
National Energy Act of 2008 & Electricity Regulation Act | **Administering Authority:** Department of Energy
The purpose of the act is to ensure that diverse energy resources are available in sustainable quantities and at an affordable price and to provide for integrated energy planning, increased generation and consumption of renewable energies, contingency energy planning, holding of strategic fuel stocks and carriers, provide appropriate energy infrastructure, data on energy demand, supply and generation and establish institutions responsible for energy research.
White Paper on the Energy Policy of the Republic of South Africa December 1998 | **Administering Authority**: Department of Energy
The White Paper on Energy Policy (DME, 1998) sets out the Government's policy concerning the supply and consumption of energy for the next decade. The policy strengthens existing energy systems in certain areas, calls for the development of underdeveloped systems and demonstrates a resolve to bring about extensive change in several areas. The policy addresses all elements of the energy sector.
Strategic Integrated Projects | **SIP Coordinator:** Eskom
The South African Government adopted an Infrastructure Plan, and from the spatial analysis of the country's needs carried out, 17 Strategic Integrated Projects (SIP) have been identified that cover a wide range of economic and social infrastructure. The construction and operation of the powerline and associated infrastructure addresses

the following SIP:

SIP 10: Electricity transmission and distribution for all

Expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development. Align the 10-year transmission plan, the services backlog, the national broadband roll-out and the freight rail line development to leverage off regulatory approvals, supply chain and project development capacity. The activities undertaken for the proposed project will contribute to SIP 10 is achieved. A SIP letter is attached to the application.

ASTRONOMY ADVANTAGE AREAS

The Astronomy Geographic Advantage (AGA) Act 21 of 2007	**Administering Authority:** SARAO

The Act gives the Minister of Science and Technology the power to protect areas, through regulations, that are of strategic national importance for astronomy and related scientific endeavours. Regulations (R.465 of 22 June 2012) have been promulgated in terms of Sections 22 and 23 of the Act to prohibit or restrict certain activities in core Astronomy Advantage Areas in terms of the Astronomy Geographic Advantage Act, 2007. Regulation 2f indicates the restriction to the operation, construction, or expansion of facilities for generating, transmitting, or distributing electricity.

Though the proposed project is not within a declared AAA core area, SARAO has been included as a stakeholder.

HEALTH AND SAFETY

Occupational Health and Safety Act (Act No. 85 of 1993)	**Administering Authority:** DoL

The purpose of the act includes providing for the health and safety of persons at work and the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

Alongside the Act, a compensation scheme for victims of occupational accidents and diseases and their dependants is foreseen in the Compensation for Occupational Injuries and Diseases Act 130 of 1993. In addition, there are ancillary occupational safety and health regulations (e.g, Construction Regulations, 2014; Environmental Regulations for Workplaces, 1987; Facilities Regulations, 2004).

The applicable Regulations should be implemented and adhered to during the project life cycle.

OTHER LEGISLATION

- ✓ National Forest Act, 1998 (Act No. 84 of 1998)
- ✓ Promotion of Access to Information Act (No. 2 of 2000)
- ✓ Promotion of Administrative Justice Act (No.3 of 2000)
- ✓ Protection of Personal Information Act (No. 4 of 2013)
- ✓ Spatial Planning and Land Use Management Act (Act No. 16 of 2013)
- ✓ Hazardous Substances Act (No. 15 of 1973)
- ✓ National Roads Act (Act No. 93 of 1996)

REGULATIONS

- ✓ National Appeal Regulations of 2014
- ✓ Regulations laying down the procedure to be followed for the adoption of spatial tools or environmental management instruments published (GN 542, 2019)

✓ Procedures for the assessment and minimum criteria for reporting on identified environmental themes (GN 320, 2020)
GUIDELINES AND PLANS
✓ National Biodiversity Assessment, 2018 ✓ National Development Plan ✓ South Africa's National Infrastructure Plan 2050, Government Notice No. 1874 of 2022
PROVINCIAL, DISTRICT AND LOCAL MUNICIPALITIES
✓ Limpopo Environmental Management Act (Act No. 7 of 2003). ✓ Limpopo Spatial Development Framework ✓ Thulamela Local Municipality IDP (2023-24) ✓ Thulamela Local Municipality LED Strategy, 2021 ✓ Vhembe District Municipality SDF (2016-17) ✓ Thulamela Local Municipality LED Strategy ✓ Vhembe District Municipality IDP (2022 - 2027) ✓ Vhembe District Bioregional Plan.
ESKOM STANDARDS AND GUIDELINES
✓ Chemical Spillage Assessment and reporting. ✓ Waste Management. ✓ Water Strategy. ✓ Water Management Policy. ✓ Vegetation management and maintenance within Eskom land servitudes and Right of Way.

3.4 Permits And Registrations

Table 3-3 indicates the permits that are required for the project.

Table 3-3: Required Permits

LEGISLATION	PERMIT	COMPETENT AUTHORITY	STATUS
NEMA: EIA Regulations GNR 326 (as amended)	Environmental Authorization	Department of Forestry, Fisheries, and the Environment (DFFE)	On-going
National Water Act Government Notice (GN) 509, published in August 2016 in Government Gazette (GG) no. 40229	Water Use License/ General Authorization	Department of Water and Sanitation (DWS)	On-going
National Forest Act, 1998 (Act No. 84 of 1998)	Tree Permit	Department of Agriculture, Forestry and Fisheries	Not started

4 NEED AND DESIRABILITY

This section of the report details the information required as per Section 3(1)(f) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

DEA, 2017 highlights the need to consider how the proposed project may impact ecosystems, biological diversity; pollution; and renewable and non-renewable resources. In addition, there is also a need to assess how the development may affect or promote justifiable economic and social development by considering the relevant spatial plans, including Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). Therefore, need and desirability addresses whether the development is being proposed at the right time and place. Similarly, the 'Best Practicable Environmental Option' (BPEO), as defined in NEMA, is "the option that provides the most benefit and causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term."

The energy needs of poor households are still immense. Sustainable Development Goal 7 (SDG7) calls for "affordable, reliable, sustainable and modern energy for all" by 2030. According to National Development Plan (NDP) 2030, the goal is for universal electrification by 2030 with 90% on-grid connections and the remaining access being provided by off-grid connections or energy alternatives. This project therefore contributes to the realisation of the universal electrification goal to ensure poverty alleviation. In addition to the NDP 2030, various national and district plans indicate the need for adequate electricity supply in rural areas. These are briefly discussed below:

4.1 National Infrastructure Plan (NIP) and Strategic Infrastructure Projects (SIP)

The National Infrastructure Plan 2050 (NIP 2050) was promulgated in 2022. The aim is to identify the most critical actions that are needed for sustained improvement in public infrastructure delivery and that will have impact in the short term but with the longer-term imperatives in view (DPW&I, 2022). The NIP is mostly non-spatial, focusing on a strategic level and proposing a range of infrastructure but also financial and institutional interventions. The first National Infrastructure Plan with 18 identified Strategic Integrated Projects (SIPs) was developed and adopted by Cabinet in 2012 (PICC, 2012). SIP10 emerging from the 20212 NIP is critical for this project as it entails Electricity transmission and distribution for all.

4.2 Energy Security Master Plan -Electricity 2007- 2025

The proposed project will also address some of the Electricity Master Plan (EMP) goals. The goals of the Electricity Master Plan for South Africa are as follows:

- Supporting economic growth and development.
- Improving the reliability of electricity infrastructure.
- Providing a reasonably priced electricity supply.
- Ensuring the security of electricity supply as set by a security of supply standard.
- Diversifying the primary energy sources of electricity.
- Meeting the renewable energy targets as set in the EWP.
- Increasing access to affordable energy services.
- Reducing energy usage through energy efficiency interventions.
- Accelerating household universal access to electricity.
- Clarifying some of the policy issues in the context of an evolving electricity sector.

4.3 Limpopo Province Spatial Development Framework (LPSDF)

The proposed project will ensure access to affordable, reliable, sustainable, and modern energy. Energy is crucial for realizing Limpopo PSDF vision and achieving Provincial Spatial Outcomes 1, 2 and 4. The vision, spatial outcomes and objectives of the Limpopo PSDF are discussed below:

Vision

The PSDF envisions a provincial spatial structure where the natural environment and valuable agricultural land are protected for future generations, with a strong, diverse, and growing economy, and that offers its residents high quality living environments and good job opportunities.

The National Spatial Outcomes put forward in the NSDF have been contextualized for Limpopo as follows:

Provincial Spatial Outcome One

A network of consolidated, transformed, and well-connected urban nodes, regional development anchors and rural service centres that enable Limpopo to derive maximum transformative benefit from urbanization and concentrated rural settlements, enabling climate change adaptation, inclusive economic development, and equal, effective, and efficient access to social services in support of equitable and inclusive provincial human capital development.

Provincial Spatial Outcome Two

Provincial-scale corridors and productive rural regions enable sustainable livelihoods supported by economic diversification through green industrialization and participation in the Fourth Industrial

Revolution, mutually beneficial urban-rural linkages, and wise management, nurturing and conservation of ecological assets and ecosystem services.

Provincial Spatial Outcome Three

Provincial connectivity and movement infrastructure systems are strategically located, extended, and maintained, to support a diverse, ecologically sustainable, adaptive, regenerative, and inclusive economy, and a set of key provincial, national, and regional gateway cities and towns.

Provincial Spatial Outcome Four

Productive rural regions are supported by sustainable resource economies and strong and resilient regional development anchors provide effective, efficient, and equitable access to people living in rural areas to the provincial, national, and global economy.

Provincial Spatial Outcome Five

The provincial ecological infrastructure and natural resource foundation are well-protected and managed, to enable climate change mitigation and sustainable and equitable access to water, high-potential agricultural land, minerals, and other natural resources, both for current and future generations.

Provincial Spatial Development Objectives

Taking cognizance of the revised Provincial Spatial Vision and Provincial Spatial Outcomes, the Provincial Development Objectives were amended as follows:

- Capitalize on the Province's strategic location within the SADC region to facilitate trade links and regional cooperation on resource sharing.
- Capitalize on and improve regional and local connectivity to establish a connected network of nodes and settlements.
- **Provide a strategic and coherent rationale for public sector investment, including engineering, community, and economic infrastructure, to optimize service delivery.**
- Encourage urban and rural spatial restructuring to address spatial injustice and facilitate climate change mitigation and adaptation.
- Aggressively protect and enhance the province's natural resources, including scarce fresh water sources and high biodiversity landscapes.
- Guard valuable agricultural land as a scarce resource and national asset.
- Consolidate and enhance the province's ecotourism product.
- Encourage and institutionalize the sustainable development of its massive mineral potential and encourage diversification and industrialization through green economy initiatives.

- **Create an enabling environment for both large- and small-scale business development (retail, office, commercial, industrial).**

4.4 Limpopo Integrated Infrastructure master plan (LIIMP), 2014

The development of LIIMP is aligned with the Infrastructure Development Act, which was signed into law by the President on 30 May 2014, and which aims to speed up and improve the delivery and implementation of social and economic infrastructure, as well as to maximize the developmental impact. The LIIMP development also aligns to the provincial planning of Limpopo, as such it aligns to the Limpopo Development Plan (LDP). The aim of LIIMP is to provide a strategic framework that will guide planning, delivery, operation, and maintenance of appropriate infrastructure for the provision of services, such as electricity, transportation, ICT, water, and sanitation, as well as social services such as education and health, in response to consumer needs and as a strategy to unlock the development potential of Limpopo in a sustainable manner, including socio-economic infrastructure.

The objectives of LIIMP are:

- To implement of a provincial integrated infrastructure master plan that aligns and responds essentially to the Strategic Integrated Projects (SIPs) of the Presidential Infrastructure Coordinating Commission and the Limpopo Development Plan (LDP) and including other relevant documents and plans that have significant impact for infrastructure that support the objectives of the LDP.
- To implement a plan to the current infrastructure current status quo.
- Extensive consultative process with various specified provincial stakeholders (Includes national, provincial, local government and private sector), attend Meetings/workshops.
- To annually updating the provincial infrastructure master plan including adjustments from the Medium-Term Expenditure Framework (MTEF) and assessing changes to objectives, trends and adjustments aligned to the province's strategic plans and assessing inputs to the infrastructure database.

4.4.1 Implications of LIIMP in Vhembe district

- Provide situational infrastructure analysis to address the backlog.
- Encourage integration of infrastructure plans.
- Alignment of plans to speed up service delivery.
- Plan and monitor infrastructure development.
- Guide infrastructure delivery to where it is needed most to create a high impact.

4.5 Vhembe District Spatial Development Framework

The Vhembe District Municipality SDF proposes the following vision for the district, which provides a combination of aspiration and key strengths to be leveraged. The vision of the District's SDF is:

"A spatially integrated district striving towards effective sustainable development, service delivery and improving accessibility to economic resources.

The proposed project will aid in attaining some of the objectives indicated below:

- Creating an integrated and spatially just society through the equitable and sustainable spatial restructuring of Vhembe's urban and rural settlements.
- Spatial restructuring through the development of a new SMART city with supporting smaller nodes that are integrated with well-defined corridors.
- Optimizing the rich and balanced mix of Vhembe's natural assets in agriculture, tourism, heritage, natural and mineral resources, and eco system services within their scenic settings (These are contained in the sacred sites and important bio-diverse landscapes of the Soutpansberg, Mapungubwe and Kruger National Parks and the fertile Luvuvhu river valley).
- Economic potential arising from its relatively dense populations along the R523, R524 and R578 corridors and its strategic position straddling the international N1.
- Great North Road transport corridor linking Gauteng to the SADC countries by road and rail.
- **Ensuring targeted investment and maintenance of key infrastructure networks including transport, water resources and energy to achieve sustained economic growth and improved service delivery in the district".**

4.6 Vhembe District and Thulamela Local Municipalities Integrated Development Plans

Vhembe District and Thulamela Local Municipalities Integrated Development Plans (IDPs) indicate that there are 12 substations in the district namely, Sanari, Makonde, Tshikweta, Leeudraai, Paradise, Flurian, Pontdrif, Musina and Nesengani. The backlog is currently 9x 132/22KV to be built at Singo, Mashau, Mamaila, Mageva, Mbahe, Jilongo, Mandala, Tshilamba, and Lambani. The challenges that have been indicated in terms of energy are energy supply and interruption, lack of capacity to supply the demand, insufficient capacity of the power station to supply all areas in the district, cable theft, Illegal connections, poor project management PSPs and Slow rate of construction. The proposed Mutshikili substation near Tshilamba will aim at strengthening the network currently supplied by the Makonde substation, specifically the Makonde-Thengwe 22kV feeder which has problems with overloading and non-compliance with the reliability guide in terms of its total length of 295km. The new Mutshikili substation is therefore meant to:

a) reduce the customer base of Makonde substation (MTG).
b) reduce the load on MTG.
c) improve the voltage profile of MTG.

d) Reduce the length of MTG.

The activities identified to address these constraints entail the following:

i. Construction and operation of ±7km, 2 x 132kV kingbird conductor lines from the Makonde-Sanari 132kV power line to loop in and out of the new Mutshikili 132/22kV 2x20MVA substation.

ii. Construction and operation of a 132/22kV substation. The structure will also comprise the following components:

- 132kV Line bays.
- sectionalized 132kV tubular busbar.
- 2 x 20MVA 132/22kV Transformers.
- Linear 22kV busbar.
- 3 x 22kV feeder bays (outdoor MV Box structure configuration).
- 2 x future 22kV feeder bays (busbar only, no equipment).
- Build a standard control room to house all secondary equipment.
- Build a palisade fence around the substation; and
- 15m communication mast.

iv. Construction of a ±6 m wide road from the gravel road to the proposed substation. The length of the road is approximately ±200 m measured from the gravel road.

5 BASIC ASSESSMENT PROCESS

A Basic Assessment (BA) is a proactive and systematic process where both positive and negative potential environmental impacts associated with certain activities are assessed. Every BA project has two objectives namely, process and content objectives. The process objectives are to ensure that the process is open, transparent, and inclusive, supply stakeholders with sufficient information afford them ample opportunity to contribute and make them feel that their contributions are valued. The content objectives of the project are in the form of “hard” information: facts based on the scientific and technical study, statistics, or technical data.

Section 24(4) of NEMA prescribes that the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment must, inter alia, concerning every application for environmental authorization, ensure that the general objectives of Integrated Environmental Management (IEM) are considered. The BA should include an investigation of the potential consequences or impacts of the alternatives to the activity on the environment and an assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity. Figure 5-1 overleaf presents the BA process to be followed for the proposed development.

5.1 Objectives of a Basic Assessment

The objectives of the BA process are:

(a) To determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context.

(b) Identify the alternatives considered, including the activity, location, and technology alternatives.

(c) Describe the need and desirability of the proposed alternatives,

(d) Through the undertaking of an impact and risk assessment process inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of the impact of the proposed activity and technology alternatives on these aspects to determine:

   i. the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and

   ii. the degree to which these impacts:

   (aa) can be reversed.

(bb) may cause irreplaceable loss of resources; and

(cc) can be managed, avoided, or mitigated.

(e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—

i. identify and motivate a preferred site, activity, and technology alternative.

ii. identify suitable measures to manage, avoid or mitigate identified impacts; and

iii. identify residual risks that need to be managed and monitored.

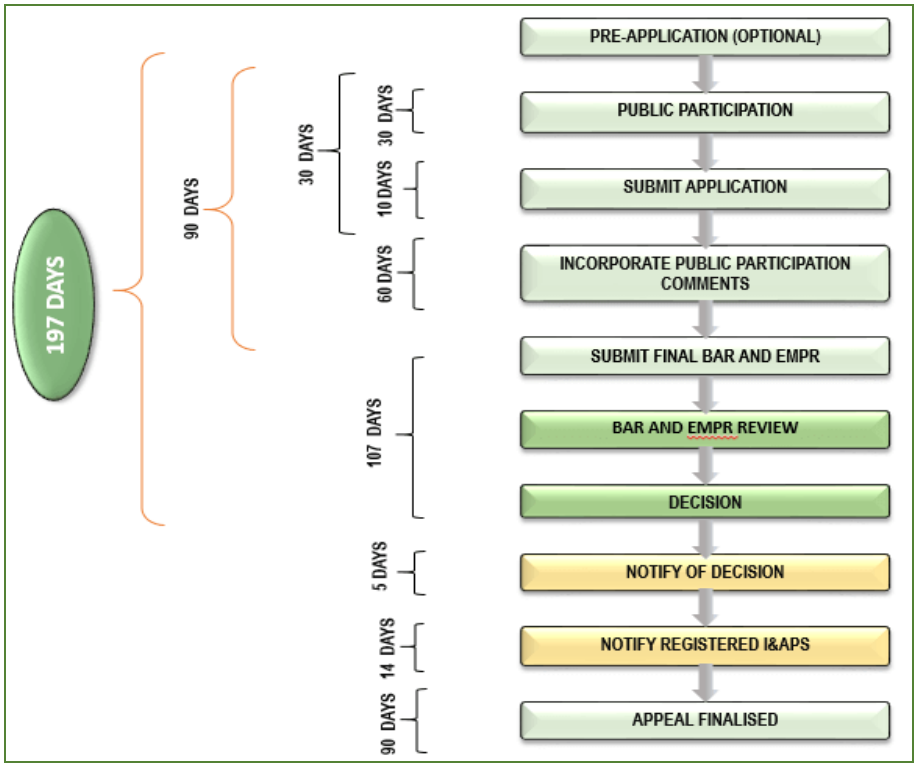


Figure 5-1: Basic Assessment Process

5.2 Previous Applications

Subsequent to the Environmental Authorization issued in 2011 and the failed land negotiations with the custodians, a new application for assessing a 2000m corridor was lodged in 2019 (DEA Ref: 14/12/16/3/3/1/2122). This application received a negative Environmental Authorization due to the lack of comments from LEDET, who are the custodians of nature reserves that had been indicated as occurring within the project area. The response by DFFE to the appeal lodged on the 29th of July 2021 indicated that revisions had to be made to the BAR which had to be submitted for public review before it was finalized. As the specified timeframe lapsed before the final BAR was submitted to DFFE, a new

application had to be lodged. This report has therefore been compiled as part of the requirements of a new EIA application.

5.3 METHODOLOGY

The following phases have been undertaken for this assessment:

5.3.1 Screening Phase

Screening is the first stage in the EIA process whereby the EAP and the applicant determine if an EIA is required for the project in terms of the EIA Regulations Government Notice R (GNR) 326 of 2017 as amended, and its associated Listing Notices. The screening process carried out in 2016 and February 2023 determined that based on the project activities, a Basic Assessment process was required as the construction of the 132kV power line and substation is listed in Listing Notices 1 (GNR 327) and 3 (GNR 324) as amended in April 2017. In addition, Screening Reports for the powerline corridor and substations were generated from the National Web-based Environmental Screening Tool, and they provided site-specific baseline information and sensitivities. The reports are attached in Appendix B as per the requirement.

5.3.2 Pre-Application Meeting

As the project had been previously applied for and issued with a negative Environmental Authorization, it was deemed important for a pre-application meeting to be convened with DFFE. This was done to gain advice on the activities to be applied for, the specialists' studies required and the public participation process to be followed. The minutes of the meeting held on the 20th of January 2023 are attached in Appendix C.

5.3.3 Literature Review

A background study was undertaken to reassess the environmental baseline conditions of the project area. Policy, legal and administrative framework, and requirements were identified through the review of relevant legal documents, guidelines, and planning procedures. This was done to ensure that necessary measures are included in the design and implementation of the project. Reference is made to Section 3 of this report. The following documents were also consulted:

i. Farm owner information from Windeed.
ii. Limpopo, Vhembe, and Thulamela Local Municipality Integrated Development Plans (IDP), Spatial Development Frameworks (SDF), Local Economic Development (LED)
iii. 2018 Limpopo Province Map of Critical Biodiversity Areas and Ecological Support Areas.
iv. Department of Water and Sanitation (DWS), then Department of Water Affairs (DWA) Integrated Environmental Management (IEM) series.
v. Other Provincial and local municipality environmental tools.
vi. Relevant documents on water published by the Department of Water and Sanitation.

vii. Eskom's project motivation.

In addition, spatial data was also used to identify the affected farms, different habitats, and sensitive areas within the area of study.

5.3.4 Site Assessment and Specialist Studies

DIGES conducted several site inspections from November 2016 to June 2023. During the field surveys, the project area was covered with a vehicle where access routes existed and on foot. Photographs were taken to document the existing environmental conditions on site. Specialist impact assessments were commissioned as part of the environmental process to investigate and assess the impacts associated with the proposed project as well as prescribe mitigation measures. The specialist studies undertaken include agricultural, archaeology, aquatic, avifauna, biodiversity, geotechnical, paleontology, visual and wetland delineation. Reference is made to Appendix E-1 to E-10 for the detailed reports. The assessment methodologies applied by the specialists are based on guidance specific to each topic area, i.e., Protocols for the assessment and minimum report content requirements of environmental impacts for various environmental themes.

5.3.5 Public Participation

An active approach was taken to identify potentially Interested and Affected Parties. Preliminary information for identifying the Interested Parties was solicited from the Councilors, Tribal and Community liaison. Stakeholders were notified of the reapplication via e-mails and a revised Background Information Document was also submitted. Reference is made to Appendix G-1. To ensure that the proper protocols were followed regarding the notification of the communities within the project area, a meeting was held with the Chief on the 14th of July 2023. It was indicated that the Chief would consult with the headmen who would then convene public meetings. These meetings will be undertaken during the public review of the Draft Basic Assessment Report. An advert has been placed in the Sowetan to notify the public regarding the availability of the Draft Report for review and comments.

Notifications will be sent to inform stakeholders and IAPs of the availability of the DBAR for a 30-day public review period. All comments received will be incorporated into the Comments and Response Report that has been compiled for the previous application. Reference is also made to Section 7 of this report for the comprehensive details of the public participation process.

5.3.6 Impact Assessment

An impact assessment has been carried out and has been guided by the following criteria:

- **Assessment Criteria for Impacts**: As a means of determining the significance of the various impacts that can or may be associated with the project, a series of assessment criteria were

used for each impact. These criteria included an examination of the nature, extent, duration, intensity, and probability of the impact occurring, and assessing whether the impact will be positive or negative for the biophysical and social environments at the site and surrounding areas.

- **Environmental Sensitivity Map:** An environmental sensitivity map was used to indicate environmentally sensitive features found on site that must be protected.
- **Maximization of Positive Impacts:** The philosophy followed focused on maximizing the benefits to the local environment.
- **Specialists Integration**: DIGES collated information from all specialists and summarized it in this report.
- **Identification of Mitigation Measures and Environmental Management Programme:** The mitigatory measures recommended describe possible actions for the reduction of the significant negative environmental impacts identified in the assessment. As per Government Notice 435 of March 2019, a project that entails the construction of power lines and substations should submit a generic EMPr as developed by the Competent Authority. The plan provides guidelines for the planning, construction, operation, maintenance of the proposed power line and substation, as well as a holistic management and monitoring plan for the entire project. The relevant Sections as determined have been completed and the EMPr is appended to this report.

5.4 Assumptions and Limitations

Assumptions made by the EAP are indicated below whilst those made by the specialists are indicated in Section 10.

- ✓ It is assumed that the Eskom has provided adequate details concerning the activities to be carried out and the processes to be followed during the construction and operation phase.
- ✓ This study was carried out with the information available to the EAP at the time of executing the study, within the available timeframe and budget. The sources consulted are not exhaustive and additional information, which might strengthen arguments or contradict information in this report might exist.
- ✓ The study team obtained its data on affected farm owners in the Windeed-Deeds office. It is assumed that this information is correct and has identified all the affected landowners.
- ✓ Information used to inform the assessment was limited to data and GIS coverage available at a local, regional, and national level at the time of the assessment.
- ✓ It is assumed that the specialists' reports are factual and give a correct indication of the environment and how the project activities will impact these resources.

- ✓ It is also assumed that the public participation process carried out is adequate and has identified all the Interested and Affected Parties.
- ✓ An exact commencement date for the construction phase is unknown. It is assumed that construction will commence after an Environmental Authorization has been issued and the appeal process has been undertaken.
- ✓ The exact location of construction camps and material laydown areas have not yet been specified. It is therefore assumed that the camps will be located within the corridor and that the camp will consist of temporary structures, ablution facilities will be portable toilets and temporary shower facilities.

6 ALTERNATIVES

This chapter identifies and describes the alternative infrastructure options and motivation for site selection for the proposed project. In terms of the NEMA EIA Regulations GN326, one of the criteria to be considered by the Competent Authority when considering an application is "*any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimize harm to the environment*". Alternatives are defined in the Regulations as "*different means of meeting the general purpose and requirements of the activity*". It is, therefore, necessary to provide a description of the need and desirability of the proposed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives will have on the environment and the community, that may be affected by the activity.

The "*feasibility*" and "*reasonability*" of an alternative will therefore be measured against the general purpose, requirements and need of the activity and how it impacts the environment and on the community that may be affected by the activity. It is therefore vital that the identification, investigation, and assessment of alternatives address the issues/impacts of a proposed development.

6.1 Location Alternatives

'These are considered for the entire proposal or a component of a proposal with the latter sometimes being considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate and alternative locations that are in close proximity. Alternative locations in the same geographic area are often referred to as alternative sites.' DEAT, 2004.

6.1.1 Route/ Corridor Selection Criteria

The terrain and location of the distribution line corridor and constructability issues must be considered for new and existing ROW since both may have a significant bearing on cost and effects on environmental resources. Among the constructability factors considered is the availability of space considering the existing infrastructure ability to avoid or minimize the location of structures along steep slopes or embankments or within environmentally sensitive areas such as wetlands. The rationale used when identifying the powerline corridor and substation alternatives is given below:

6.1.1.1 Biophysical Criteria

- **Biodiversity:** The construction and maintenance of a distribution line and substation through intact environments may result in alteration and disruption to the habitat including impacts to fauna and avian species and an increased risk of forest fires. The avoidance of the corridor passing through sensitive environmental resource areas such as intact environments is desired hence this criterion was weighted of high significance.
- **Land Capability:** This was considered in the context of agricultural potential, i.e., the loss of agricultural area due to the Right of Way. This was given a moderate weighting since some agricultural activities are allowed within the ROW if the minimum vertical and horizontal distances set out by Eskom are kept. In addition, the substation only requires a site footprint of 2.5 hectares.
- **Watercourses Crossings:** the spanning of power lines across rivers and locating the substation near water courses may result in sedimentation and water pollution hence crossing of rivers should be minimised.
- **Current Land-use:** the intensity of the current site use and the associated value of that use was considered especially in the agricultural context as the area is largely comprised of residential and subsistence agricultural farms. This also included an indication of the likelihood of landowner objection should the power line traverse across their properties.

6.1.1.2 Technical Criteria

- **Engineering:** the terrain and location of the distribution line corridor and constructability issues must be considered for new and existing ROW since both may have a significant bearing on cost and effects on environmental resources. Among the constructability factors considered is the ability to avoid or minimize the location of structures along steep slopes or embankments, in areas of rock outcroppings, or within environmentally sensitive areas such as wetlands. This aspect was given high significance.

6.1.1.3 Social Criteria

- **Visibility:** the visibility of the power line to local receptors was considered in the context of the current visual environment and about the receptors. This aspect was weighted as being of moderate significance as the mountain area is in a near natural condition.
- **Proximity to Receptors:** The proximity of the site to the nearest receptor population is defined in terms of the likely extent of impacts such as noise, and visual and air quality impacts. The proximity was estimated as the approximate distance to the closest average receptor. A single structure was not considered an average receptor.
- **Heritage:** this entails the existence of archaeological objects that may be impacted by the construction of the power lines and substations which may result in increasing the time frame and costs of the project.

The criteria referred above was assigned weights from 1-3 in terms of environmental importance and the anticipated impacts where 1 was assigned to criteria of low significance and 3 for criteria with high significance. For example, due to the pristine nature of the environment near the low mountains, biodiversity was deemed as a highly significant criterion whilst vacant land is assigned a weight of 1 since the impacts expected are low due to the lack of vegetation. The table below shows how the site scores and the weights were assigned for each criterion:

Table 6-1: Weighting and Site Scoring against criteria

Site Selection Criteria	Site Scoring Against Criteria			Weight
	Low (1)	*Medium (2)*	*High (3)*	
Bio-physical				
Biodiversity	Impacted Area	Area of Low sensitivity	Area of conservation importance	**3**
Land Capability	No potential	Low potential for Agriculture	Agricultural areas/high agricultural potential	**2**
Proximity to a watercourse	>500 m	Within 500m	<200m	**3**
Current Land-Use	No use	Moderate use	Intensively used	**2**
Technical				
Engineering	No constraints	With constraints that can be easily addressed	With constraints that can be addressed resulting in high costs	**3**
Social				
Visibility Proximity to receptors	Low visibility in the project area >2500 m	Relatively visible in the project area 500 m to 2500 m	High visibility in natural areas. <500m	**2**
Heritage Archaeological resources	>5km	Within 500m	<200m	**2**

To compute the total score of each site, the site score of each criterion was multiplied by the criterion weighting to get a weighted site score. All weighted site scores for a powerline corridor and substation alternative were added to get the total score per site. The site with the lowest total site score was the most preferred.

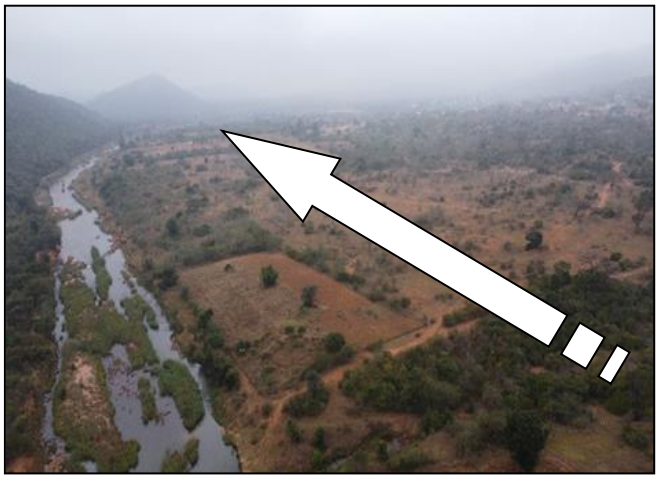
Based on the above table, environmental datasets were overlaid to get the character of the areas where the corridors and substation sites are located. The following datasets were used to make a comparison of the alternative sites:

i. 2018 Limpopo Province Map of Critical Biodiversity Areas and Ecological Support Areas sourced from the (SANBI Biodiversity GIS , 2023).

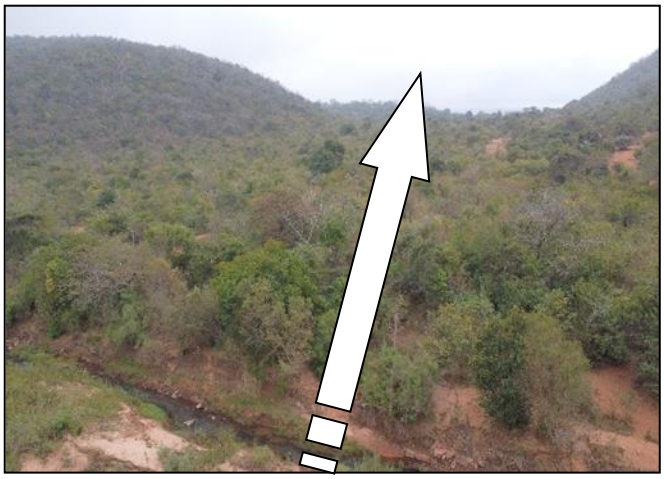
ii. National Biodiversity Assessment (2018) for the Terrestrial Ecosystem Threat Status sourced from (SANBI Biodiversity GIS , 2023).
iii. Land Capability. The source of data is the ARC-GIS.
iv. Land use data sourced from the DFFE spatial database.
v. 2015 Important Bird Areas (IBAs) sourced from SANBI Biodiversity GIS, 2023).
vi. 2018 National Wetland Map and Confidence 5 sourced from (SANBI Biodiversity GIS, 2023) on the 24th of March 2023.
vii. National Freshwater Priority Areas (NFEPA) Rivers compiled by the (Council for Scientific and Industrial Research, 2023) and sourced from the SANBI Biodiversity GIS sourced on the 24th of March 2023.
viii. Existing power lines. The source of data is Eskom.
ix. Heritage Resources. Sourced from SAHRIS-previous projects undertaken.
x. Protected Areas (SACAD and SAPAD) sourced from DFFE website.

The general project area is shown in the photos below, and the corridors are described in the next Section.

View of the Mutale River



View of the Mutale River and the T-off Point



The route and substation alternatives identified are discussed in the next sub-sections:

6.1.2 Power Line Route and Corridor 1

Start: 22° 45' 0,760" S, 30° 36' 54,080" E

Mid-point: 22° 43' 30,626" S, 30° 35' 56,144" E

End: 22° 42' 48,409" S, 30° 34' 13,475" E

Assessed Corridor width: 1km (1000m)

The route starts from the T-off point of an existing power line near Tswera south of the Mutale River. From the T-off point, the power line will follow a northerly corridor, crossing the river and passing over a low mountain at Makwilidza then cutting and bending across the settlement area at Makwilidza. It will then follow a direct route, traversing within agricultural fields and parallel to the gravel road until it reaches the preferred substation site Alternative 3 to the east of Thengwe. Reference is made to Figure 6-1:

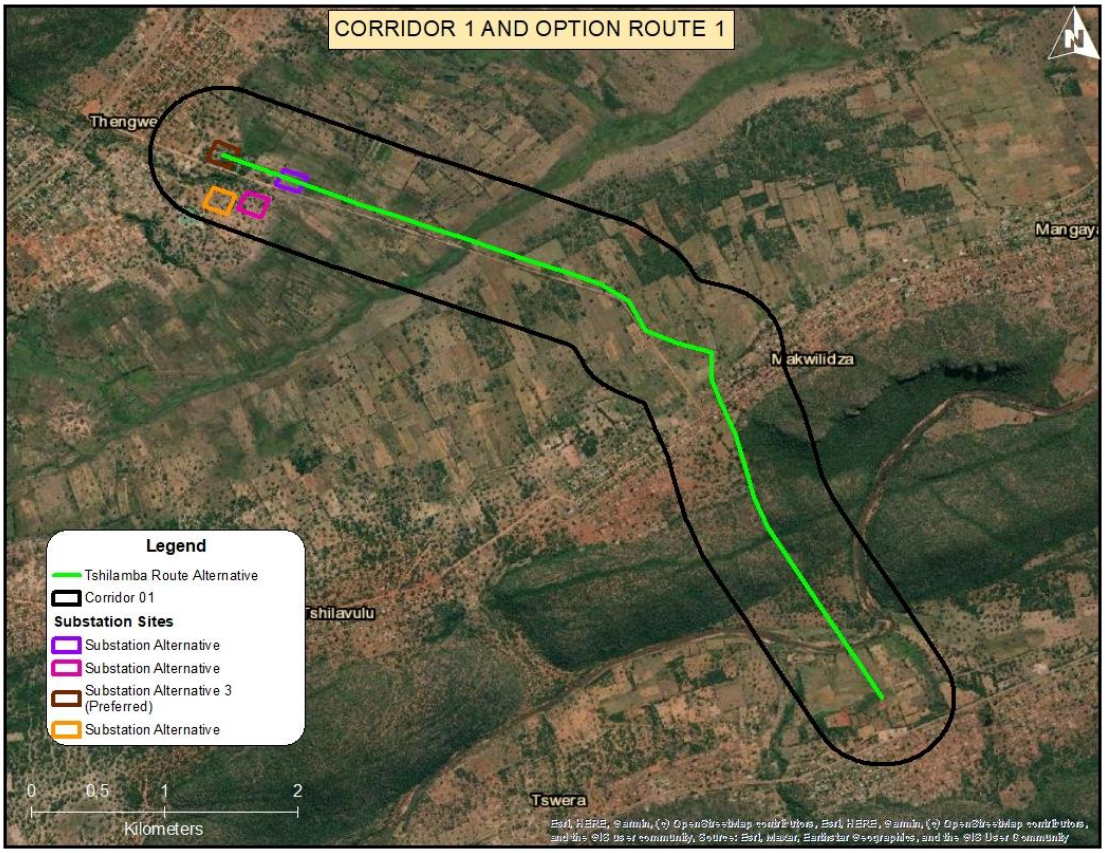


Figure 6-1: Assessed Alternative Route and Corridor 1

6.1.3 Powerline Route and Corridor 2 (Preferred)

Start: 22° 45' 24,345" S, 30° 35' 44,377" E

Mid-point: 22° 43' 41,572" S, 30° 35' 33,467" E

End: 22° 42' 48,409" S, 30° 34' 13,475" E

Assessed Corridor width: 1km (1000m)

The proposed T-off for Alternative 2 from the existing power line (Makonde Sanari) is in Tswera west, north of the tar road. The junction is north of the town near houses where modified natural vegetation is present. The broader corridor crosses agricultural fields but to the west it encroaches into a drainage line, before crossing over the Mutale River. North of the river, the corridor crosses between two mountains, Makwilidza and agricultural farms where it merges with Alternative 1 and runs parallel the gravel road to substation site 3.

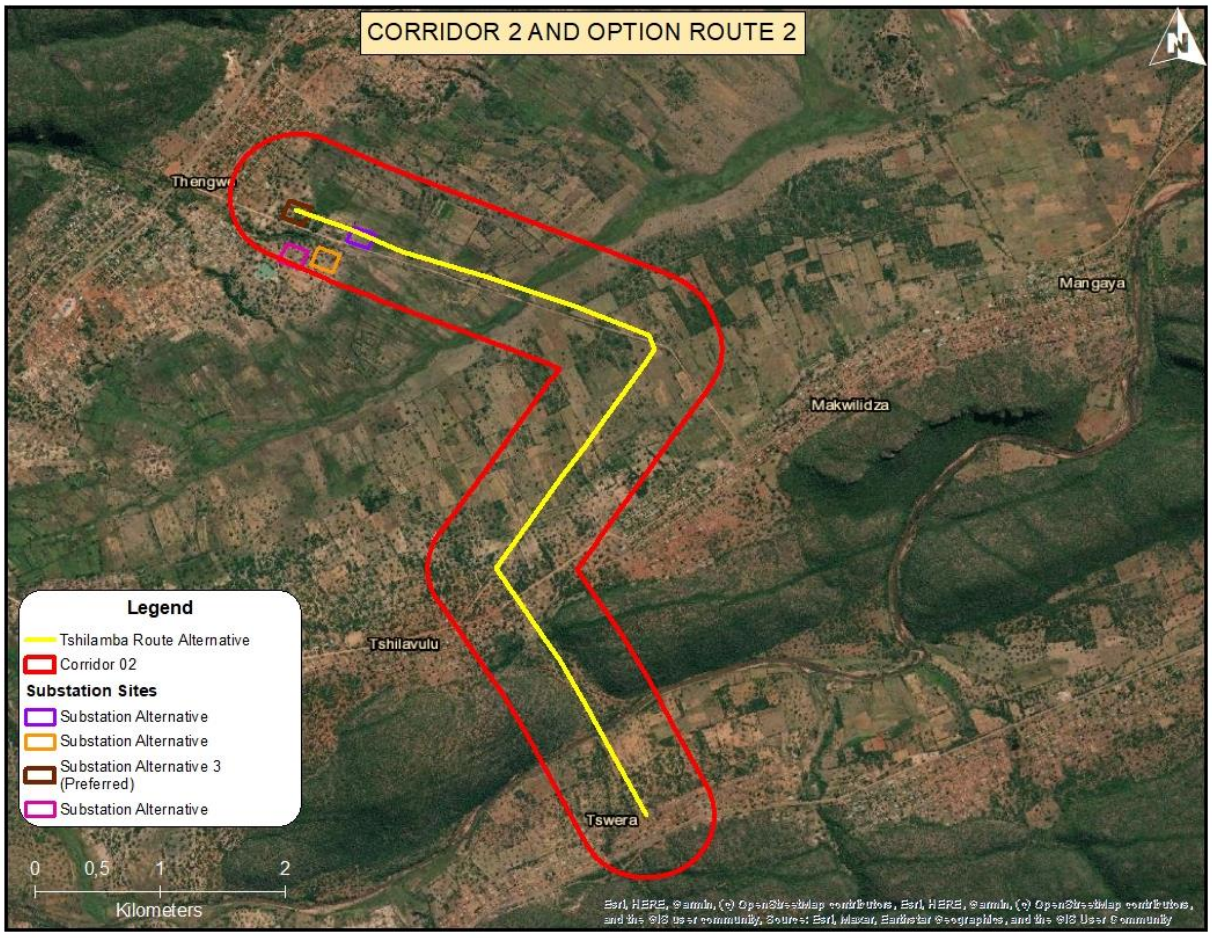


Figure 6-2: Assessed Alternative Route and Corridor 2

6.1.4 Criteria for Preferred Powerline Route and Corridor

The criteria indicated in Section 6.1.1 was utilised to choose the preferred powerline corridor.

Table 6-2: Corridor scores against criteria

Site Criteria	Site Score	
	Alternative 1	**Alternative 2**
Biodiversity	High (3)	Medium (2)
Comments	The site is within the Vhembe Biosphere Reserve and will cross areas classified as CBA and ESA. The corridor crosses a low mountain.	The site is within the Vhembe Biosphere Reserve and will cross areas classified as CBA and ESA. The corridor crosses between two low mountains (valley).
Land capability	Medium (2)	High (3)
Comments	Marginal potential arable land (Class IV) with a low potential for agriculture and Class VIII classified as wilderness. Subsistence is practised in some sections of the corridor.	Marginal potential arable land (Class IV) with a low potential for agriculture. Subsistence is practised in some sections of the corridor. Area characterised of farming is larger than in Corridor 1.
Water Courses	High (3)	High (3)
Comments	The corridor crosses the Mutale and Mulondida river and wetlands. The transfer zone of the Mutale River, with multiple tributaries feeding into the river near the corridor.	The corridor crosses the Mutale and Mulondida river and wetlands.
Current Land-use	Medium (2)	Medium (2)
Comments	The corridor traverses across natural vegetation, watercourses, settlements, and agricultural fields.	The corridor traverses across natural vegetation, watercourses, settlements, and agricultural fields.
Engineering	High (3)	Medium (2)
Comments	The corridor is shorter (6.5km) than Corridor 2 and follows a more direct route however it crosses the Mutale River near its confluence with its tributaries and will also cut across the low mountain which will result in the construction of towers on steep slopes which will have a high environmental impact and construction costs.	The corridor is longer (7.5km) than Corridor 1, however it crosses the Mutale River where its narrow and will also traverse in between two low mountains (valley) resulting in lower environmental impacts construction costs.
Visibility and Proximity to receptors	High (3)	High (3)
Comments	Due to the proximity of the site to the road and the current land use. The powerline will be visible to residents and motorists.	Due to the proximity of the site to the road and the current land use. The powerline will be visible to residents and motorists.
Heritage	Medium (2)	Low (1)
Comments	The area is also not within a provincial/ national declared heritage site. Graves were noted within the corridor	The area is also not within a provincial/ national declared heritage site. A grave was noted were the corridor joins with corridor 1.

Table 6-3: Total site scorings for each alternative

Site Selection Criteria		Corridor and Route Alternative 1		Corridor and Route Alternative 2	
	Weight	Site Score	**Total**	Site Score	**Total**
Biodiversity	**3**	3	**9**	2	**6**
Land Capability	**2**	2	**4**	3	**6**
Water Courses	**3**	3	**9**	3	**9**
Current Land-Use	**2**	2	**4**	2	**4**
Engineering	**3**	3	**9**	2	**6**
Visibility	**2**	3	**6**	3	**6**
Heritage	2	2	**4**	**1**	**2**
Total			**45**		**39**

6.1.5 Substation Locations

Two substation sites (Alternatives 1 and 2) were identified initially in 2016 with Alternative 1 being the preferred site, however a geotechnical investigation undertaken in August 2022 indicated water ingress at site alternative 1. As such two additional sites (Alternative 3 and 4) were identified for assessment. This report therefore assesses four site alternatives. The locations of the sites are indicated in Figure 6-3.

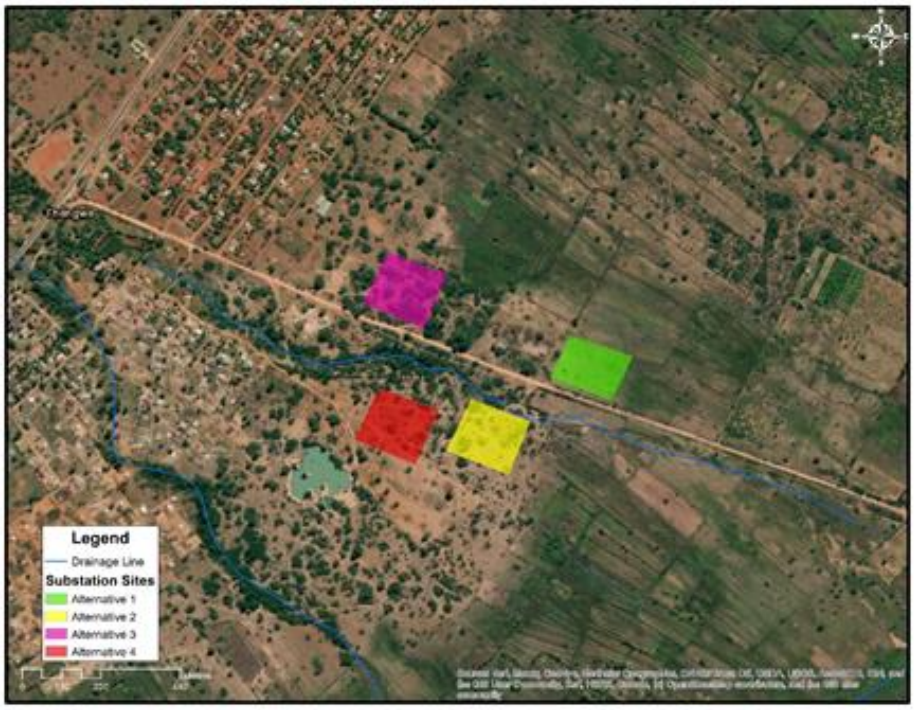


Figure 6-3: Alternative Substation Locations

6.1.5.1 Substation Alternative Site 1

The site for the substation is located on Tengwe's Location 255 at the following coordinates: 22° 42' 54.834" S, 30° 34' 30.255" E. The area is classified as Ecological Support Area 2 characterised by a gentle slope with scattered vegetation. According to the National Biodiversity Assessment, 2018, the site is within an area classified as a seep and the non-perennial river, Mulondida is approximately 500m away.

6.1.5.2 Substation Alternative Site 2

The site for the substation is located on Tengwe's Location 255 at the following coordinates: 22° 43' 0.58" S, 30° 34' 20.999" E. The area is classified as Ecological Support Area 1 characterised by a gentle slope with scattered vegetation. A drainage line runs from the northern to the eastern section of the site with a gulley nearby that shows remnants of erosion.

6.1.5.3 Substation Alternative Site 3 (Preferred)

The site for the substation is located on Tengwe's Location 255 at the following coordinates: 22° 42' 48.409" S, 30° 34' 13.475" E. The area is classified as Ecological Support Area 1 characterised by a gentle slope with scattered vegetation. Illegal dumping was also noted at the site indicating that the community nearby is using the area as a dump site.

6.1.5.4 Substation Alternative 4

The site for the substation is located on Tengwe's Location 255 at the following coordinates: 22° 42' 59.675" S, 30° 34' 12.752" E. The area is classified as Ecological Support Area 1 characterised by a gentle slope with scattered vegetation. A drainage line runs approximately 70 m from the site, running from the northern to the eastern section of the site with a gulley near that show's remnants of erosion. See Photo below:

6.1.6 Criteria for Preferred Substation

Table 6-4: Substation sites against criteria

Site Criteria	Site Score			
	Alternative 1	**Alternative 2**	**Alternative 3**	**Alternative 4**
Biodiversity	High (3)	High (3)	High (3)	High (3)
Comments	The site is in an area classified as ESA2 with degraded vegetation.	The site is in an area classified as ESA1 with degraded grassland and large trees in some sections.	The site is in an area classified as ESA2 with degraded woodland.	The site is in an area classified as ESA1 with degraded grassland and large trees in some sections.
Land capability	Medium (2)	Medium (2)	Medium (2)	Medium (2)
Comments	Marginal potential arable land (Class IV) with a low potential for agriculture.	Marginal potential arable land (Class IV) with a low potential for agriculture.	Marginal potential arable land (Class IV) with a low potential for agriculture.	Marginal potential arable land (Class IV) with a low potential for agriculture.
Water Courses	High (3)	High (3)	Low (1)	High (3)
Comments	The site footprint is within an area characterised as a seep wetland.	The site footprint is less than 20m from a delineated wetland and gully.	The site footprint is approximately 170 m from the drainage line. A road demarcates the site from the drainage line.	The site is approximately 220m from the wetland and a gully was noted close by.
Current Land-use	Low (1)	Low (1)	Low (1)	Low (1)
Comments	The site footprint is fallow.	The area is characterised by grassland, dense bush, and thicket in some sections. It is utilised as grazing land.	Illegal dumping was noted which could be attributed to the site's proximity to the residential area.	The area is characterised by grassland, dense bush, and thicket in some sections. It is utilised as grazing land.
Engineering	High (3)	High (3)	Low (1)	High (3)
Comments	The area is generally flat with no physical landforms. Water seepage was noted at 0.6m and this may result in high construction costs for the	The area is generally flat with no physical landforms; however, the presence of the wetland and gully pose a challenge.	The area is generally flat with no physical landforms. The site topography and soil characteristics can be factored in during the final substation	The area is generally flat with no physical landforms; however, the presence of the wetland and gully pose a challenge.

Site Criteria	Site Score			
	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	substation foundation.		design.	
Visibility and Proximity to receptors	High (3)	High (3)	High (3)	High (3)
Comments	Due to the proximity of the site to the road and the current land use. The substation will be visible to residents and motorists.	Due to the proximity of the site to the road and the current land use. The substation will be visible to residents and motorists.	Due to the proximity of the site to the road and the current land use. The substation will be visible to residents and motorists.	Due to the proximity of the site to the road and the current land use. The substation will be visible to residents and motorists.

Table 6-5: Total Site Scorings for each alternative

Site Selection Criteria		Substation Alternative 1		Substation Alternative 2		Substation Alternative 3		Substation Alternative 4	
	Weight	Site Score	**Total**	Site Score	**Total**	Site Score	**Total**	Site Score	**Total**
Biodiversity	**3**	3	**9**	3	**9**	3	**9**	3	**9**
Land Capability	**2**	2	**4**	2	**4**	2	**4**	2	**4**
Water Courses	**3**	3	**9**	3	**9**	1	**3**	3	**9**
Current Land-Use	**2**	1	**2**	1	**2**	1	**2**	2	**4**
Engineering	**2**	3	**6**	3	**6**	1	**2**	3	**6**
Visibility	**3**	3	**9**	3	**9**	3	**9**	3	**9**
Total			**39**		**39**		**29**		**39**

Sites 1 and 3 are generally similar and the same is true for sites 2 and 4. The four sites are nearby as such the biophysical environment is similar except for the erosion and the drainage line noted at alternatives 2 and 4. Constructing a substation at sites 2 and 4 will exacerbate the erosion that is noted at the site, whilst the water ingress noted at substation site 1 is not economically viable. Site alternative 3 is therefore the preferred alternative in terms of the selection criteria.

The table below indicates the recommended corridor and substation site from the Specialists' perspective.

Table 6-6: Recommended Corridor and Substation Site

THEME	COMMENTS
Agriculture	Substation alternatives 1, 2, and 4 are located within crop fields and some rangeland vegetation, making them less suitable for the proposed project. Substation **Alternative 3** is far from the crop fields, which makes it more suitable for the proposed power line. **Corridor 1** is the most suitable choice for powerline development in this agricultural area. **Corridor 1** allows for uninterrupted subsistence farming operations. However, alternative two can be suitable by moving corridor two powerlines more to the edges of the crop fields to avoid the intensive disruption of farming.
Archaeology and Cultural Heritage	**Substation Alternative 1** is the most preferred alternative from a heritage impact perspective since the land appears to have been used in the past for issues related to farming, and areas of this nature are not ideal for archaeological materials as any materials that could have existed there, would have been destroyed by past farming activities. This is followed by Site Alternative 2, 3 and then 4. **Route Alternative 2** is also the most recommended since it mostly transverses over farmland and a few graves. Accordingly, and from a holistic perspective, any alternative will not have a significant negative impact from a heritage impact perspective. It should however be noted that none of the alternatives will have a significant negative impact.
Aquatic Biodiversity	**Substation Site Alternative 3**: The substation is situated at least 170 meters way from water a stream and the powerline to be connect to it does not transverse any stream
Avifauna	Substation Alternatives 2 and 4 are located adjacent to an ephemeral drainage line and a dam - habitats that are likely to attract a variety of priority species. The displacement impact is likely to be more significant at these two locations given the presence of these waterbodies (disturbance) and the woodland habitat prevalent at

THEME	COMMENTS
	each location (habitat loss). Substation Alternative 1 is in an area that is already transformed and although Alternative 3 is located within woodland habitat, this site is adjacent to what appears to be an old school building with an access road. **Alternatives 1 or 3** are therefore nominated as the preferred substation alternative. In terms of micro habitats, power line corridor Alternatives 1 and 2 are largely identical. Therefore, the length of the power line has been considered. A shorter length of power line is likely to reduce the potential collision impact as well as the indirect displacement impact associated with habitat loss and disturbance. Corridor Alternative 1 is approximately 6.5km in length and Corridor Alternative 2 is approximately 7.5km in length. It is on this basis that **Corridor Alternative 1** is nominated as the preferred power line alignment alternative. It is important to note that neither of the two power line alternatives are fatally flawed and the proposed 132kV power line can be constructed and operated in either of the two alternative corridors with appropriate mitigation.
Biodiversity	Substation ▪ **Alternative 1** is the preferred option (plant and animal perspective). ▪ Alternative 3 is a viable option from an ecological perspective. ▪ Alternative 2 and 4 are not viable due to their proximity to the water resources. From an ecological perspective, the **corridor (Alternative 2**) following the "valley floor" is more acceptable due to the current impacts. It will ensure easy access during construction and limited clearing of trees and shrubs is needed. With careful planning during the layout of the final pylon positions, it will be possible to avoid large trees, including the protected species and the other indigenous species present.
Geotechnical	The side walls of most test pits excavated on site collapsed. Water seepage was encountered in 2 test pits (TP27 and TP28) at a depth of 0.6 m. Considering soil profiling and lab results, the preferred position for the substation should be in the vicinity of either PT17 or TP15 or TP13 **(Substation Site 3).**
Hydrology	There are no hydrological impacts at the substations close to catchment 2, as they are situated further away from any water course. Therefore, the substations' location

THEME	COMMENTS
	remains unaffected by potential flooding events, contributing to the overall safety and stability of the powerline infrastructure in catchment 2. From a hydrological perspective, **Corridor 2** which intersects the Mutale River mid-segment (Catchment 1), wider flood lines are observed across the pediment with a south-eastern direction. These flood lines encroach upon cultivated land along the north banks of the Mutale River segment. This indicates that the impact of the proposed powerline construction on the hydrological setting of corridor 2 is minimal to negligible.
Paleontology	There is no preferred route and no preferred site for the new substation as far as the paleontology is concerned.
Visual	The **four substation sites** have similar high visual impact as there is no dense and high natural vegetation to screen the infrastructure from residents and tourists using the road or from household in the vicinity of the proposed development. Alternative 1 will have a higher visual impact to residents and travellers south and north of the mountain and if the corridor for Alternative 2 is restricted to the valley between the mountains, the visual impact will be lowered compared to a corridor on the mountains east and west of the low-lying area. **Alternative 2**, using the corridor in the valley, is recommended as it lowers the visual impacts associated with the higher mountain areas.
Wetland Delineation	Substation 3 and Corridor 2 are recommended.

6.1.7 No-Go Action Alternatives

The description of the baseline or existing environment or status quo is essential to all environmental assessments and should be focussed on the key characteristics of, and values or importance attached to the environment. The baseline, or 'no-go' option, as well as all other relevant alternatives, must be described, assessed, and evaluated at the same scale and level of detail that enables adequate comparison with the proposed project. DEAT, 2004

Should the development not proceed, the area will remain unchanged and will continue to be used for grazing and farming unless a different development is undertaken. However, as there have been impacts associated with wood collection, these would persist within the natural areas (mountain).

In addition, the non-implementation of the project would result in:

- A failure to contribute to the realization of Sustainable Development Goal 7: affordable, reliable, sustainable, and modern energy for all by 2030.
- A failure to build and strengthen the distribution network to accommodate growth in customer base. Thulamela Local Municipality's IDP has indicated that within Vhembe District, Thulamela has the highest population concentration with a 0.6% annual growth rate. The municipality's electricity needs are therefore higher than what the existing network can provide.
- Loss of economic opportunities that would have been realized during the construction phase of the project.

6.1.8 Access Routes

Temporary access routes capable of accommodating construction plant, material and workers are required for the construction of each tower and the installation of conductors. These roads with an average width of 6m are constructed within the distribution corridor/ servitude, however the access road to the substation will be 6m and ±200m long. The co-ordinates for the substation access road are:

Start: 22° 42' 50,112"S, 30° 34' 9,215"E

Mid: 22° 42' 46,671"S, 30° 34' 11,196"E

End: 22° 42' 46,617"S, 30° 34' 13,909" E

6.2 Activity Alternatives

According to DEAT, 2004, consideration of activity alternatives entails the change in nature of the proposed activity to meet the same need. No-go alternative can also be assessed under these alternatives. These are sometimes referred to as project alternatives, although the term activity can be used in a broad sense to embrace policies, plans, and programmes as well projects. Consideration of such alternatives requires a change in the nature of the proposed activity. (DEAT: 2004d)

Power can be transmitted by either overhead power lines or underground power lines. The advantages and disadvantages of installing the underground cable or the overhead power lines are discussed in the table below. These are mainly related to magnetic fields, engineering, and costs.

Table 6-7: Comparison of Overhead line vs Underground cables

TYPE	ADVANTAGES	DISADVANTAGES
Underground	» Minimal visual impact due to being below the ground. » Have lesser losses. » Lines are less affected by extreme weather conditions, thereby increasing power supply reliability.	» The cost of underground cables, including the laying of the cables, is higher than overhead lines. » Finding and repairing the wire breaks in case of system failure is challenging and time-consuming. » Underground system maintenance is complex due to the underground cabling. » Lines cannot be uprated to increase the capacity. » Underground cables are subjected to damage due to ground movement due to earthquakes.
Overhead	» Lines are easy to repair and maintain. Lines are not restricted by landscape i.e., they can be easily installed over rivers, roads, or hilly regions. Cheaper to construct compared to underground.	» Lines have a visual impact. » Lines are susceptible to terrorism, vandalism, and lightning. Lines may have an impact on birds and aircraft.

Based on the high cost and maintenance aspects, underground cables were not considered viable.

6.3 Design Alternatives

Weight and susceptibility to natural and human-induced conditions are essential in distinguishing and determining characteristics of various tower sizes. The towers will be determined after the route has been finalized at the final design stage. The towers that are being considered are listed below and reference is made to Figure 2-1:

- 7611: Intermediate monopole structure
- 7615: Guyed mono pole strain structure
- 76183: Pole Strain
- 7812: 132kV H-Pole Structures.

Substation Structure

Substations are built to ESKOM's specific standards in terms of their structure and layout for maintenance purposes. Mutshikili substation is therefore expected to be generic with standard specification facilities. Reference is also made to Appendix C-1 for the preliminary design of the substation.

7 PUBLIC PARTICIPATION PROCESS

7.1 Introduction

Public Participation Process (PPP) is viewed as a process of empowering communities and stakeholders in their efforts to safeguard the resource-base in more efficient ways and to use the resources sustainably. It also enables people to play lead roles in identifying, designing, directing, and implementing any development activity which has an impact on their immediate environment, and therefore on their way of life. When undertaking an EIA project, public participation process is undertaken in terms of the Regulations set out in Chapter 6 of the EIA Regulations, Government Notice R326 of April 2017 as amended. The activities carried out as part of the process are as follows:

- *Section 40 –all registered Interested and Affected Parties (I&APs) are given 30 days to submit comments on generated reports.*
- *Section 41 – the person conducting a PPP must give notice to all I&APs by fixing notice boards, giving written notice, and placing advertisements in local newspapers and provincial/national newspapers.*
- *Section 42 – open and continuously maintain a register of Interested and Affected Parties (I&APs).*
- *Section 43 – all registered I&APs are entitled to comment on all reports and the person conducting the PPP must ensure that comments raised are brought to the attention of the proponent or applicant; and*
- *Section 44 – the person conducting the PPP must ensure that comments of I&APs and records of meetings are recorded and responded to. The comments and responses report must be attached to the reports that are submitted to the competent authority.*

7.2 Objectives and approach to the PPP

The objectives of the PPP are:

- ❑ To gather input from Interested and Affected Parties (IAPs) regarding the level and nature of their interest to better plan public participation activities related to the Basic Assessment Process.
- ❑ To obtain local knowledge from the public to enhance our understanding of the environmental, cultural, and socio-economic setting of the proposed project for use in the Basic Assessment Process.
- ❑ To understand the reasons behind the views of the public regarding the potential environmental impacts.
- ❑ To solicit public input or views regarding potential alternatives and mitigation measures to reduce environmental impacts.

- To work with the public to resolve a specific issue.
- To obtain public comments on all project documentation to verify whether information in the report is accurate, representative, and adequate.
- To provide feedback to Interested and Affected Parties about how their input, views, issues, and concerns have been considered in the process.
- To inform the public about the Competent Authority's (Department of Forestry, Fisheries, and the Environment) decision and the next steps to follow.

7.3 Methodology Adopted

Public Participation Process entails that all stakeholders that might be affected or have interest in the proposed project be afforded an opportunity to participate in the impact assessment of the project and they must each realize that they have responsibilities. See Figure 7-1 and 7-2 for the role of the Interested and Affected Parties (I&APs), the EAP and the Competent Authority (CA):

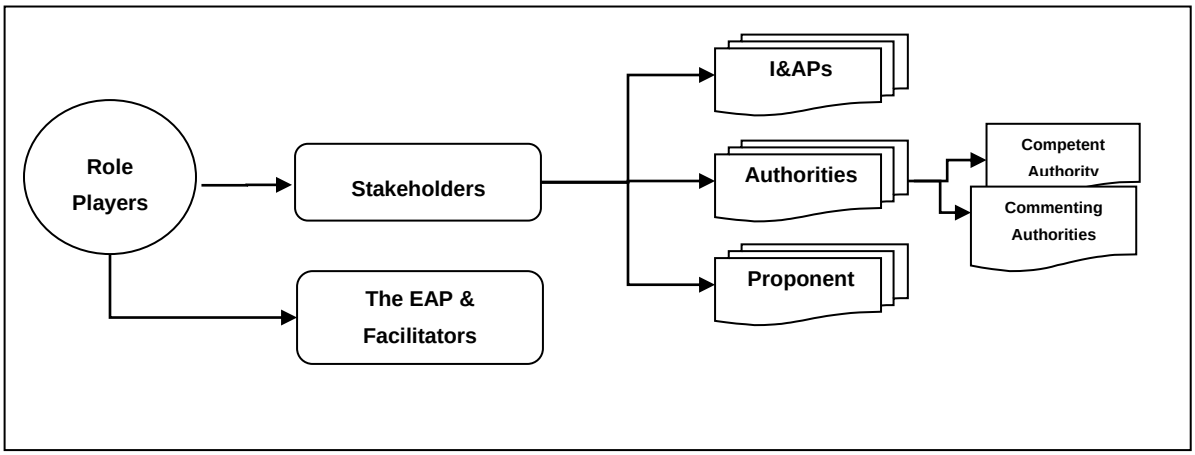


Figure 7-1: Role Players in the PPP

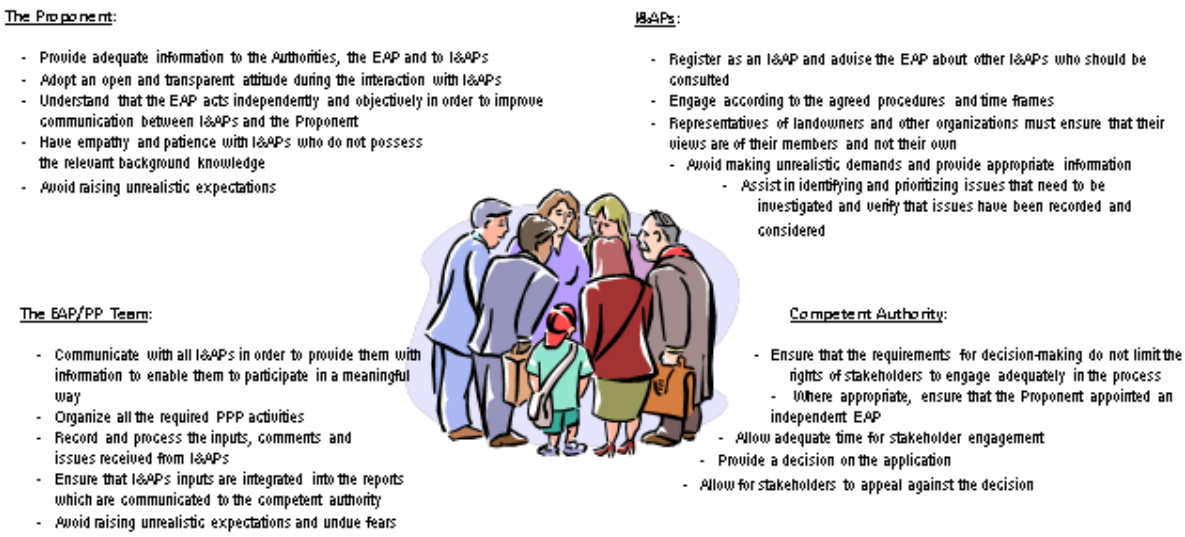


Figure 7-2: Role Players

7.4 Summary of PP Activities undertaken

The following PPP activities were carried out per Section 39-44 of the EIA Regulations as amended:

7.4.1 Site Reconnaissance

A reconnaissance site visit was undertaken at the inception of the screening phase in 2016. This was done to develop an understanding of the social context (representative structures; language; communication media, etc.). The outcome of this site visit was that information to the communities in the receiving environment would be first distributed via leadership structures that are available in these communities, namely traditional leadership. Meetings would then be held with the communities after the leadership meetings. In addition, the native language was utilized for communication during the meetings.

7.4.2 Stakeholder Identification

With the help of the landowners' database developed by consulting the previous contacts used during the 2011 application, Windeed and through networking and advertising, I&APs were identified, and these I&APs are currently registered on the database. The database of registered stakeholders includes:

- National, Provincial and Local Government.
- Tribal Authorities.

- Non-Governmental Organizations; and
- Business, Industry & Tourism.

The stakeholder database is attached in Appendix G-3.

7.4.3 Notification

An active approach was taken to identify potentially Interested and Affected Parties. Preliminary information for identifying the Interested Parties was solicited from the Councilors, Tribal and Community liaison. Stakeholders were notified of the reapplication via e-mails and a revised Background Information Document was also submitted. Reference is made to Appendix G-1. To ensure that the proper protocols were followed regarding the notification of the communities within the project area, a meeting was held with the Chief. It was indicated that the Chief would consult with the headmen who would then convene public meetings. These meetings will be undertaken during the public review of the Draft Basic Assessment Report. An advert has been placed in the Sowetan to notify the public regarding the availability of the Draft Report for review and comments. Reference is made to the attached advert in Appendix G-6.

Notifications will be sent to inform stakeholders and IAPs of the availability of the DBAR for a 30-day public review period. All comments received will be incorporated into the Comments and Response Report that has been compiled for the previous application.

7.4.4 Meetings

Meetings have been held with the traditional authorities from 2017 to date. Reference is made to the attached Comments and Response Report in Appendix G-4. In addition, minutes of meetings that will be held during the DBAR review period will be attached to the final report.

7.4.5 Comments and Response Report

A full description of the comments and issues raised during the inception and public participation phases of the previous application are recorded in the Comment & Response Report attached in **Appendix G-4.** These have also been incorporated into this document. A summary of issues and concerns raised during the previous application which have also been incorporated in this report are given in Table 7-1.

Table 7-1: Summary of concerns/issues raised during the previous application.

ISSUE/CONCERN	DESCRIPTION

ISSUE/CONCERN	DESCRIPTION
Project Location	The exact location of the substation and power line was also a major issue raised. Communities wanted to know where this infrastructure would be including if they would have access to the substation drawings.
Inception of construction phase	The approximate construction dates were also requested.
Employment Opportunities	The community wanted to know if there are any employment opportunities during the project duration.
Affected Properties	Compensation for the affected properties was one of the most raised issues. They wanted to know if they would be compensated for infrastructure demolished.

7.5 Conclusion

Based on the inputs received during the previous and current Public Participation Process, the PPP team is confident that all reasonable efforts were made to inform the public in the study area about the proposed project. The consultation process is considered to have managed to give the public, especially the tribal authorities' ample opportunity to raise issues of concern, which they might have regarding the proposed distribution power lines and new substation. The following conclusions can be made:

i. Traditional Authorities/Councils are generally considered to be representing the villagers and in most cases are the link between the population of a particular village and the outsider who is coming to use their land. Traditional leaders view the power line project in their area as having the potential for job/economic opportunities and compensation for the use of their land.

It should be noted that the consultation and/or communication with stakeholders and I&APs is ongoing throughout the study process up until the Department's decision. In addition, information regarding to the project, Basic Assessment process and the Department's decision will be communicated to all I&APs.

7.6 Way Forward

Registered stakeholders will be notified about the availability of the DBAR, and they will be advised that the full copy of the report will be posted on DIGES website.

8 THE RECEIVING ENVIRONMENT

This section of the report details the information required as per Section 3(1)(g)(iv) of Appendix 1 of Environmental Impact Assessment (EIA) Regulations, Government Notice R326 of 2017 (as amended).

This information is provided as a baseline to ensure an understanding of the possible impacts of the proposed development on the environment. As such, aspects of the biophysical and socio-economic environment that the project could directly or indirectly impact have been discussed. This information has been sourced from existing documents such as the SDFs and IDPs for the Thulamela Local Municipality and Vhembe District Municipality, the site, and the specialists' assessments. A more detailed description of each aspect of the affected environment is included in the specialist reports. The specialists commissioned are given in the table below:

Table 8-1: Specialists

Theme	Consultant
Agriculture	Lionhortic Consulting Pty Ltd
Aquatic	Naledzani Environmental Services
Archaeology and Cultural Heritage	Vhubvo Archaeo-Heritage Consultants
Avifauna	Feathers Environmental Services
Civil Aviation	GWI Aviation Advisory
Hydrology and Flood line Determination	Zara Capital
Palaeontology	Vhubvo Archaeo-Heritage Consultants
Terrestrial Biodiversity	Bioassets
Visual	Bioassets
Wetlands	Envirosheq Consulting

8.1 Climate

The final source of rainfall data was obtained from the Water Resources of South Africa 2005 Study, (WR2005, 2009). The mean annual temperature ranges from about 18 °C, in the mountainous areas, to more than 28 °C in the northern and eastern parts of the Limpopo Water Management Area (WMA). With an average of about 25,5 °C for the area around the site. Maximum temperatures are experienced in January and minimum temperatures occur on average in July.

Rainfall is strongly seasonal and occurs mainly during the summer months (i.e., October to March). The peak rainfall months are January and February, and rainfall occurs generally as convective thunderstorms and due to orographic cooling in the mountainous areas in the western part of the catchment. Cyclones, causing moderate to high intensity rainfall of long duration, occur occasionally in the far eastern parts of the proposed construction site. The mean annual precipitation varies from less than 450 mm in the plains zone to more than 1 800 mm in the mountainous areas.

The average potential mean annual gross evaporation (MAE) ranges between 1 800 mm, in the extreme western mountainous region, to 2 400 mm in the northern and eastern areas. The highest A-pan evaporation occurs in the period October to January and the lowest is in June.

The rainfall station selected to represent the study site is SAWS station 0760324 (SILOAM), which is located approximately 21.1 kilometers Southwest of the site with a rainfall record length of 92 years. The rainfall records show a mean annual precipitation (MAP) of 470.0 mm, which will be adopted for the site. Table 8-2 presents the average monthly rainfall and evaporation adopted for the site.

Table 8-2: Average monthly Rainfall and Evaporation

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall (mm)	130	116	90	51	20	11	11	14	35	74	116	128	470
Lake Evaporation	198	197	209	198	170	161	129	180	87	97	135	168	1780

8.2 Soils

Areas are classified into land types based on their slope, soil type and depth and underlying geology. The areas in the north and south of the open low mountains are characterized by slopes ranging from 0-9% and there is plinthic catena: dystrophic and/or mesotrophic, red soils widespread. Land capability in these areas is classified as Class IV: marginal potential arable land. The low mountains are characterized by rocky areas with miscellaneous soils. The clay content in the plains is less than 15%. According to Lionhortic Consulting, 2023, the study area consists of areas having low soil depths and low land capability classes. Most soils are not suitable for arable agriculture but suitable for forestry or grazing, intermediate suitability for arable agriculture, or poor suitability for arable agriculture. Based on the on-site inspection, satellite imagery, and data from individual farmers, it was shown that 45% of the land at Corridor 1 is cultivated for dry land purposes compared to 55% of Corridor 2. However, much of this area is restricted by shallow rock emanating from a rock outcrop, bedrock, or stiff clays. The sandy soil makes it difficult for most farmers to cultivate the land, so most farms resemble abandonment.

8.3 Surface Water Resources

South Africa is divided into 9 water management areas (WMA), managed by separate water boards. Each water management area (WMA) is made up of quaternary catchments which relate to the drainage regions of South Africa, ranging from A to X (excluding O). These drainage regions are subdivided into four known divisions based on size.

For example, the letter A denotes the primary drainage catchment, A2 will represent the secondary catchment, A21 represents the tertiary catchment and A21D would represent the quaternary catchment, which is the lowest subdivision in the WR2005 manual. Each of the quaternary catchments have associated hydrological parameters including area, mean annual precipitation (MAP) and mean annual runoff (MAR), etc.

The proposed corridors and substations fall in the Limpopo Water Management Area or the old Luvuvhu/Letaba Water Management Area (WMA). The major rivers in the WMA include the Limpopo, Matlabas, Mokolo, Lephalale, Mogalakwena, Sand, Nzhelele, Mutale, and Luvuvhu. The spatial extent of the area includes tertiary drainage regions A92 and quaternary catchment A92B. The upstream contributing quaternary catchment to A92B is A92A. The surface water attributes of the A92B quaternary catchment are summarized in the table below.

Table 8-3: Regional Hydrology Parameters

Quaternary Catchment	Catchment Area km^2	MAE (mm)	Evaporation Zone	Rainfall Zone	MAP (mm)	MAR (mm^3)
A92B	578.5	1763	5A	W	470	41.89

The major river within quaternary catchments A92A and A92B is the Mutale River which flows through the proposed construction area. The Mutale with its tributary Mulondida. Mukongwe and Sambandou River borders Tshitavha, HaMphaphuli and Sambadou villages. Table 8-4 below shows the rivers crossed by the proposed power line corridors whilst **Figure 8-1** shows both the WMA and the rivers.

Table 8-4: Rivers within the Project Area

Name	Class
Mutale River	Perennial
Mulondida	Non-perennial
Mukongwe	Non-perennial

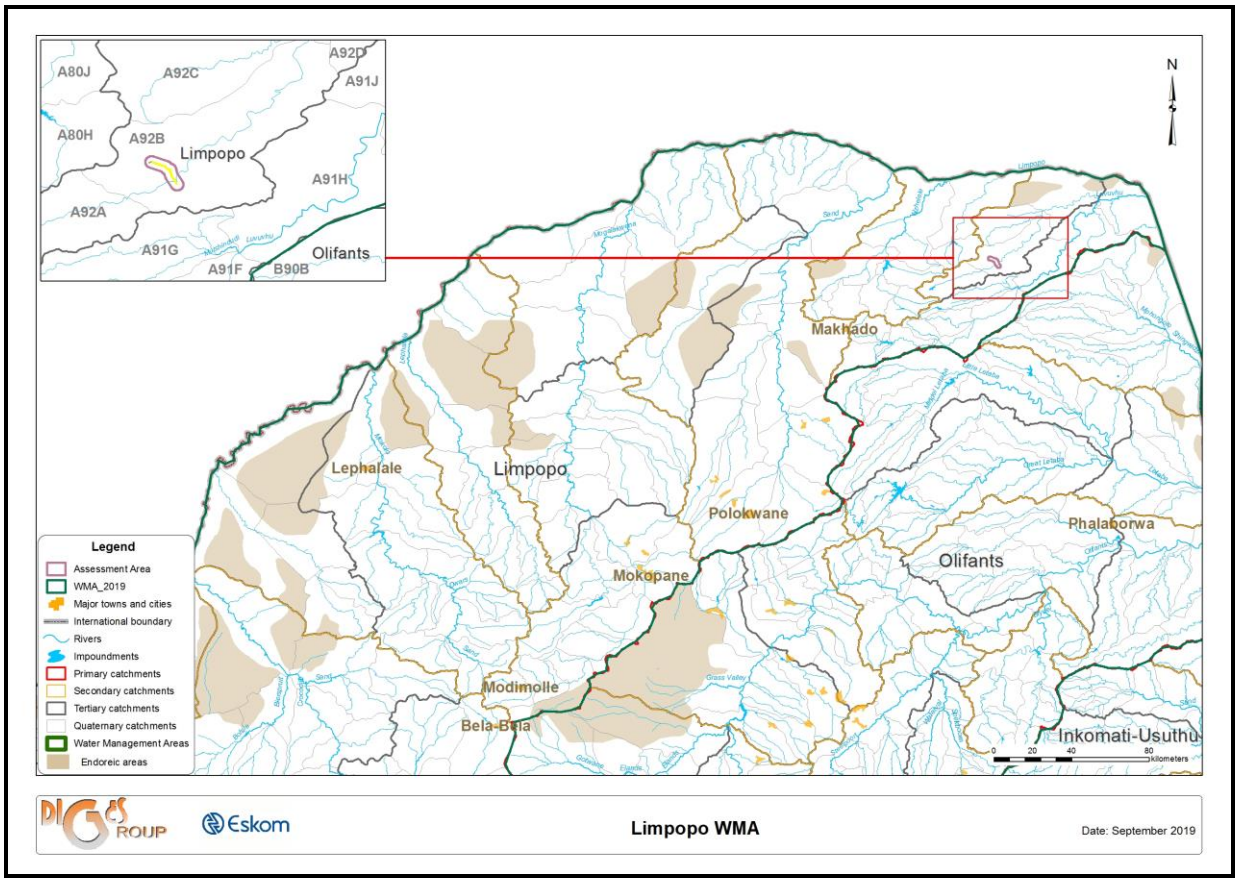


Figure 8-1: Limpopo Water Management Area

8.3.1 The National Freshwater Ecosystem Priority Areas (NFEPA)

NFEPA Project responds to the high levels of threat prevalent in river, wetland, and estuary ecosystems of South Africa (Driver et al. 2005) and provides strategic spatial priorities for conserving the country's freshwater ecosystems and supporting sustainable use of water resources. These strategic spatial priorities are known as Freshwater Ecosystem Priority Areas, or 'FEPAs'.

8.3.1.1 River FEPAs

River FEPAs achieves biodiversity targets for river ecosystems and threatened/near-threatened fish species and were identified in rivers that are currently in a good condition (A or B ecological category). For river FEPAs the whole sub-quaternary catchment is shown as a FEPA although FEPA status applies to the actual river reach within such a sub-quaternary catchment. According to the NFEPA Rivers (2011), Mutale River is classified as a **Class C: moderately modified** whilst a seep, channeled and unchanneled valley bottom wetlands. Reference is made to the map overleaf and detailed Aquatic

Impact Assessment, Hydrology and Wetland Delineation Assessment Reports are attached in Appendix E-3, E-7, and E-10 respectively.

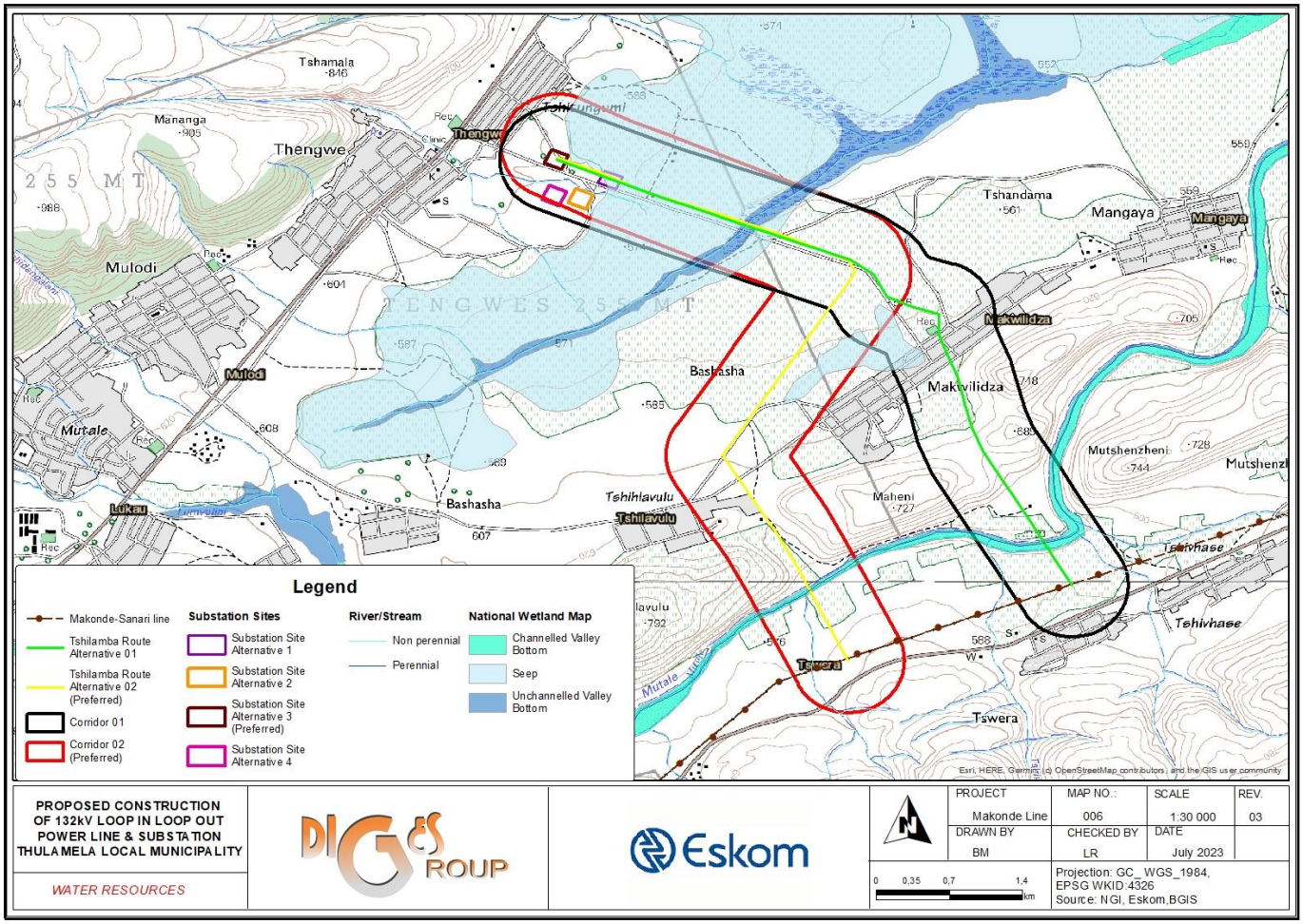


Figure 8-2: National Wetland Map

8.3.1.2 Fish Sanctuary

Fish sanctuaries are sub-quaternary catchments that are essential for protecting threatened and near-threatened freshwater fish that are indigenous to South Africa. The goal of NFEPA is to keep further freshwater species from becoming threatened and to prevent those fish species that are already threatened from becoming extinct. To achieve this, there should be no further deterioration in river condition in fish sanctuaries and no new permits should be issued for stocking alien invasive alien fish in sub-quaternary catchments that are fish sanctuaries. Where instream dams are unavoidable, guidelines for designing appropriate fishways should be followed (Bok et al. 2007; Rossouw et al. 2007). The corridor is also within an area classified as a Fish sanctuary,

8.4 Ground water

Groundwater forms part of the four sources of water available within the Local Municipality. Some villages and mining industries make use of ground water as their water source. Groundwater mostly occurs in fractured rock aquifers and primary aquifers. The presence of various geological structures, such as faults, fissures, and fracture zones, as well as contact zones of intrusions such as dykes and sills, dictate the occurrence of groundwater. In Vhembe District, ground water occurs in fractured and intergranular interstices in Sibasa basalt and intergranular interstices of alluvial and talus deposits. The two aquifer types found within the project area are

- Intergranular aquifer with a yield ranging from 0.1-0.5l/s and electrical conductivity estimated between 0-70mS/m; and
- Fractured aquifer (b3) with a yield ranging from 0.5l/s -2.0l/s and electrical conductivity estimated between 0-70mS/m.

8.5 Geological conditions

8.5.1 Lithostratigraphy

The low mountains are characterized of reddish or brown, sandstone and quartzite, conglomerate, basalt, tuff, shale, and siltstone of the Soutpansberg Group (including the Wyllie's Poort, Fundudzi and Nzhelele Formations), Mokolian Erathem. These are rocky areas with miscellaneous soils including acidic dystrophic to mesotrophic sandy to loamy soil. Glenrosa and Mispah soil forms are common. Land types are mainly Ib, Ab, Fa, Fb, Ae, and Ia.

The geology for the plains, i.e., the area from Tswera to the foothill and the substation area is characterized by the Soutpansberg Group of sandstones with lesser amounts of conglomerate, shale and basalt is mostly exposed in this area (the Wyllie's Poort, Fundudzi and Nzhelele Formations). Some Karoo Supergroup rocks are also present (Clarens and Letaba Formations). Most of the area has deep sands to shallow sandy lithosols.

8.6 Flora & Fauna

8.6.1 Flora

The threat of an ecosystem status defines the degree to which an ecosystem is still intact or has lost some of its vital aspects of its structure, function, or composition. The proposed corridors traverse across two vegetation types of the savanna biome. A detailed Biodiversity Report is attached in **Appendix E-5.**

The vegetation within the project area is discussed below. Reference is also made to the Vegetation Map below:

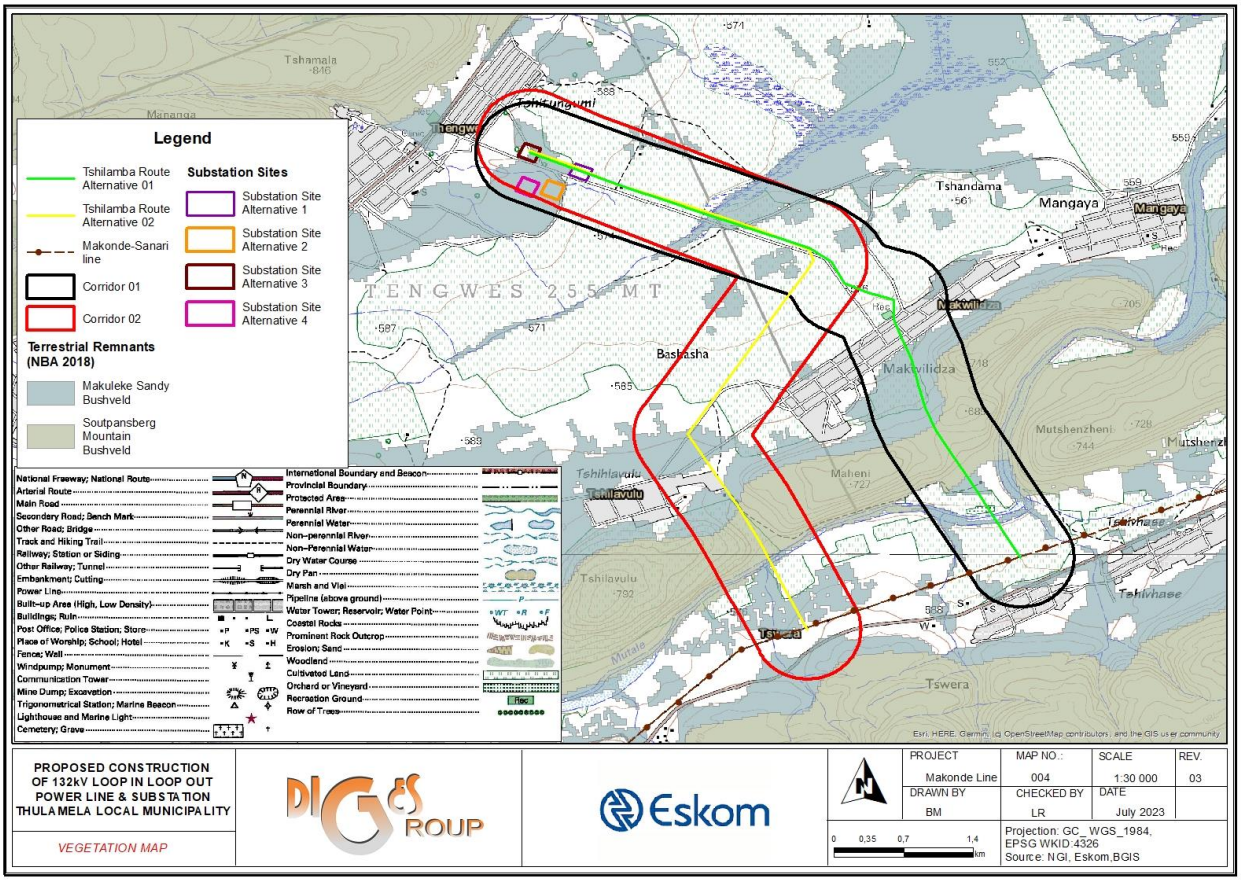


Figure 8-3: Vegetation types within the project area

A. Maluleke Sandy Bushveld (SVL1)

Excerpt from Mucina, (eds) 2010

This vegetation type is distributed in Limpopo and (very slightly into) Mpumalanga Provinces on flats and hills east of the Soutpansberg, south of Klein Tshipise and Masisi, along the valleys of the Mutale River and mid- to lower Levuvhu River. A tree savanna (or tall shrub in places) occurs on the deep sands with trees such as *Terminalia sericea*, *Burkea africana*, *Guibourtia conjugata* and *Peltophorum africana* and a moderate to dense ground layer containing, for example, *Andropogon gayanus* and *Digitaria eriantha*. On stony soils the tree savanna includes *Kirkia acuminata*, *Croton gratissimus*, *Combretum apiculatum* and *Diplorhynchus condylocarpon* while the ground layer includes dominant *Digitaria eriantha*, *Panicum maximum* and *Pogonarthria squarrosa*.

This vegetation type is classified as vulnerable with a target conservation status of 19%. Approximately 32% has been conserved mainly in the Kruger National Park whilst an estimated 27% has been

transformed through cultivation. Endemic taxa for this vegetation type are a succulent shrub and herb: *Euphorbia rowlandii* and *Ceratotheca saxicola* respectively. In the project area/ corridor, this is the predominant vegetation type, and it is found on the plains located between the substation sites and foot of the mountain and in the Tswera area.

B. Soutpansberg Mountain Bushveld (SVcb21)

Excerpt from Mucina, (eds) 2010

This vegetation type is distributed in the Limpopo and occurs on the slopes of the Soutpansberg Mountain, and Blouberg and Lerataupje Mountains in the west. The vegetation further extends eastward on lower ridges including Khaphamali and Makonde Mountains and is usually at an altitude of approximately 600–1 500 m. The vegetation type is classified as vulnerable with a target conservation status of 24%. Approximately 2% has been conserved in Blouberg, Happy Rest and Nwanedi Nature Reserves with a smaller area conserved in other reserves.

The main vegetation variations within the Soutpansberg Mountain Bushveld are subtropical moist thickets (mainly along the lower-lying southern slopes, on steep clayey soils of volcanic origin), mistbelt bush clumps (within the mistbelt of the southern and central ridges of the mountain, on rugged quartzitic outcrops with shallow sandy soils), relatively open savanna sandveld (on both deep and shallow quarzitic sands along the relatively dry middle and northern slopes of the mountain), and arid mountain bushveld (along the very arid northern ridges of the mountain). Trees and shrubs found in this vegetation type include *Acacia karroo*, *Berchemia zeyheri*, *Bridelia mollis*, *Combretum molle*, *Combretum moggii*, *Acacia nigrescens*, *Adansonia digitate.*

In the project area/ corridor, this vegetation type is only found on the open low mountains located between the substation sites and the Makonde-Sanari power line T-off.

8.6.2 Fauna

Except for domestic animals, no other large mammals have been identified within the corridor and immediate surrounds. The status quo of the site concerning the fauna is detailed in the Biodiversity Report attached in Appendix E-5.

8.6.3 Avifauna

The proposed project area is characterised by natural and near natural environment consisting of open woodland, shrub land and grassland habitat potential for hosting a variety of avi-faunal species. The presence of rivers, drainage lines and dams also offer habitat for breeding and foraging wetland associated species. According to Diamond, 2023, a total of 182 bird species have been recorded within the proposed Mutshikili Substation and 132kV power line PAOI pentads during the SABAP2 atlassing period to date. The

presence of these species in the broader area provides an indication of the diversity of species that could potentially occur at the substation locations or along the proposed power line alignment. Of the 182 species, two are regional Red List species (i.e., SCC) (Taylor et al, 2015). Relevant to this development, 30 species are classified as power line sensitive species. Of the power line sensitive species, seven are likely to occur regularly at the substation locations and along the proposed 132kV power line alignments, 19 are largely comprised of raptors and water dependent species that may traverse across the PAOI and the remaining four are likely to occur sporadically. A detailed Avi-fauna Impact assessment is attached in **Appendix E-4**.

8.7 Critical Biodiversity Areas

The current Systematic Biodiversity Plan for the province is the Map of Critical Biodiversity Areas and Ecological Support Areas (CBA Map), 2018, whose purpose is to inform land-use planning and development on a provincial scale and to aid in natural resource management. The CBA Map, 2018 is an updated Limpopo Conservation Plan V2 (LCPv2, 2013), which was created by combining the five bioregional plan CBA maps for the Waterberg (2015), Mopani (2016), Vhembe (2017), Sekhukhune (2018) and Capricorn (2018) district into a single Limpopo map.

The bioregional plan serves as the primary biodiversity informant to a range of planning and land-use authorisation processes, although it is important to recognise that the bioregional plan does not replace any planning and decision-making processes and does not grant, limit or remove land-use rights. Critical Biodiversity Areas (CBA's) and Ecological Support Areas (ESA's) are classified into different categories based on biodiversity characteristics, spatial configuration, and requirement for meeting targets for biodiversity pattern and ecological processes. South Africa Conservation Area Database (SACAD) and South Africa Protected Areas Database (SAPAD) spatial datasets obtained from DFFE indicate that the project area has been designated as a Protected Environment and Nature Reserve, LEDET however has indicated that the area is not within the protected area and Thengwe and Mphaphuli Reserves are within 10km from the project area. Table 8-5 describes the different classes and their coverages thereof within the power line corridors which encompasses the substation alternative sites. Figure 8-4 (also attached in Appendix D-2) shows the different classes traversed by the proposed corridor:

Table 8-5: CBA Categories

CBA MAP CATEGORY	DESCRIPTION	CORRIDOR 01 % COVERAGE	CORRIDOR 02 % COVERAGE
Protected Areas	Declared and formally protected areas under the Protected Areas Act, such as National Parks, legally declared Nature Reserves, World Heritage Sites and Protected Environments	-	-

CBA MAP CATEGORY	DESCRIPTION	CORRIDOR 01 % COVERAGE	CORRIDOR 02 % COVERAGE
Critical Biodiversity Area (CBA1)	are sites that are required to meet each ecosystem's biodiversity targets	16.4	14.7
Critical Biodiversity Area (CBA2)	The selected sites are the ones that best achieve targets of the systematic biodiversity plan though their areas that might achieve these targets.	10.1	7.8
Ecological Support Area (ESA1)	Areas that are important for maintaining the ecological processes on which CBAs depend. These are largely natural areas.	11.4	9.4
Ecological Support Area (ESA2)	These areas are no longer intact but potentially retain significant importance from a process perspective.	62.1	68.1

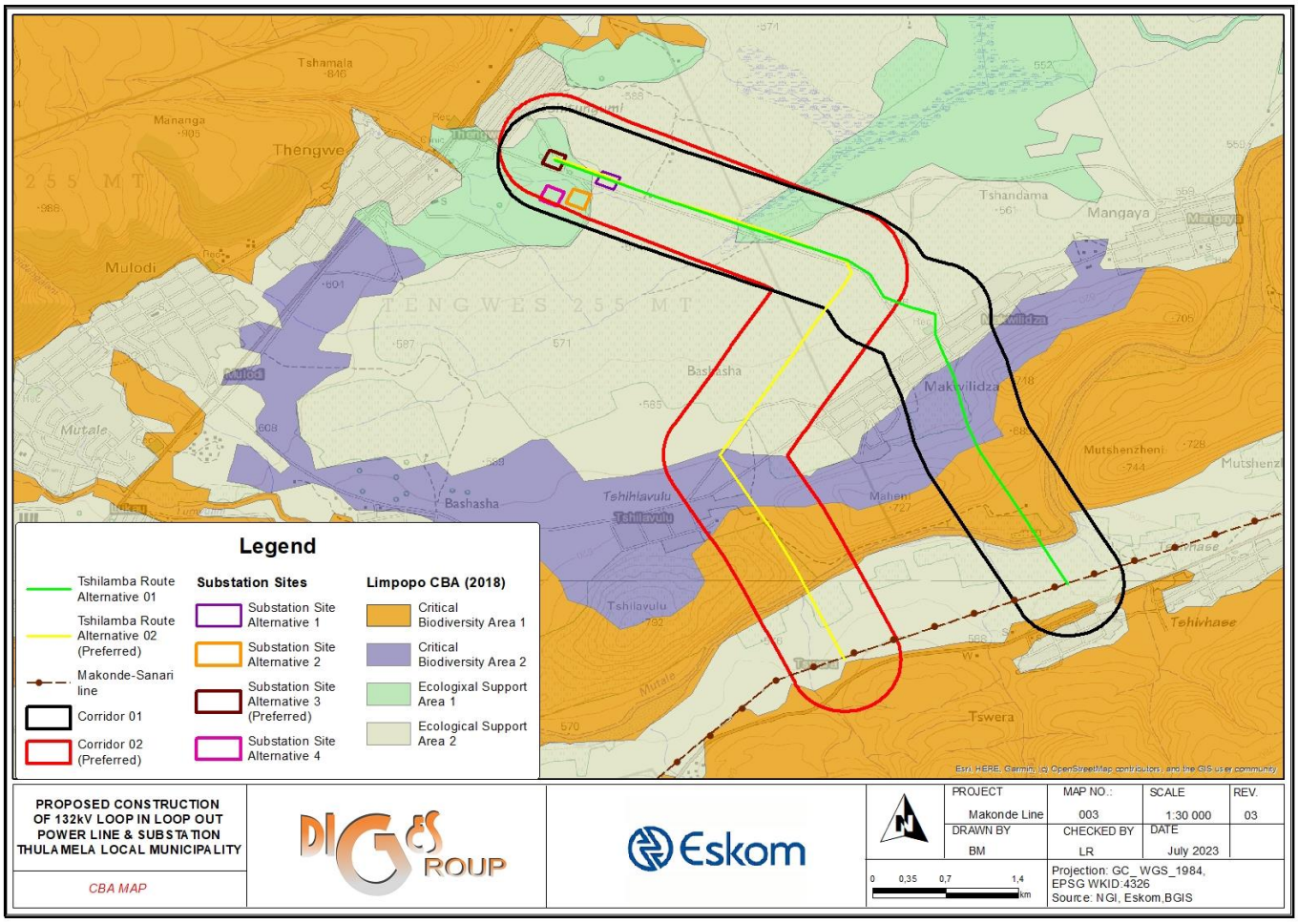


Figure 8-4: CBA and ESA within the Project Area

8.8 Vhembe Biosphere Reserve

The project area in within the Vhembe Biosphere Reserve (VBR). The VBR received international status when it was registered by UNESCO (United Nations Educational, Scientific and Cultural Organization) as a biosphere reserve in 2009 and it is South Africa's sixth biosphere reserve. It comprises the entire Vhembe District and includes the northern part of the Kruger National Park, the Makuleke Wetlands Ramsar Site on the north-east boundary of the biosphere abutting the Pafuri international border post, the Mapungubwe World Heritage Site on the north-west boundary of the biosphere and the Soutpansberg Mountain range.

The VBR's main objectives include:

- To achieve a balance between the conservation of the environment and man's use to achieve long-term sustainable development.
- To foster economic and human development which is social-culturally and ecologically sustainable; and,
- To support the demonstration projects, environmental education, and training. Research and monitoring related to local, regional, national, and global issues of conservation and sustainable development.

8.9 Land use

According to Vhembe Bioregional Plan, 2017, the land cover data indicates that 83.6% of the VDM is in a natural state and this is largely due to the proportion of the district which lies within the KNP, other PAs and the largely rural natural of the district. 12.2% is altered by agriculture, forestry erosion and degraded areas and a further 4.3% is severely or irreversibly modified by towns, settlements, and mining. The power line corridor will traverse these areas as shown in Figure 8-5. The land cover on the open low mountains is characterized by woodland, open bushland, thicket, or dense bushland. On the plains, the land-use is characterised by residential and subsistence agriculture.

The following rural settlements are in this area:

- Tswera.
- Makwilidza.
- Maheni
- Thengwe

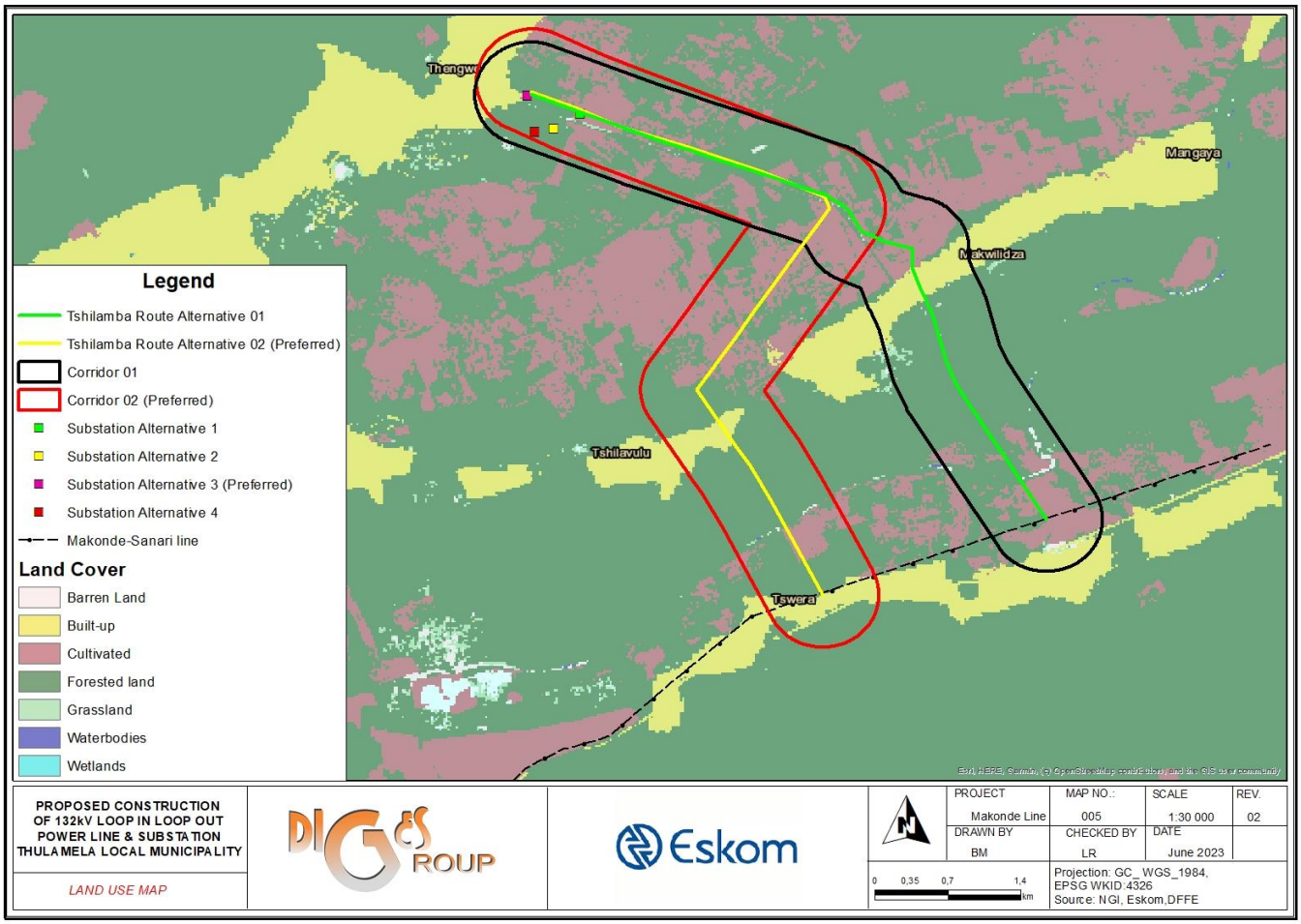


Figure 8-5: Land Cover within the Project Area

8.10 Archaeological and paleontological attributes

The project area is within the Soutpansberg Cultural Tourism Eco- corridor. The mountains play an important cultural role in the lives of surrounding communities containing many sacred and historical sites in beautiful surroundings. Where appropriate, these sites have an important cultural tourism potential, cultural tourism is the most sophisticated and long term of the various tourism market niches.

According to the National Heritage Resources Act, 1999 (Act No.2 of 1999) objects that may be affected include burial sites, buildings of more than 60 years of age, special geological features (fossil prints and bushman rock art) and paleontological objects. The corridor stretches on farming land and a section of the mountainous area and cuts across the Mutale River. These areas are ideal for archaeological materials, or historic settlements such as stone walling which are known to spread across the area. This corridor also transverse overactive subsistence agricultural fields and villages. Farmers and villagers in these areas are known to bury their loved ones in their place of dwelling.

(Magoma, 2023) Detailed heritage and desktop palaeontologic studies are attached in **Appendix E-2 and E-8.**

8.11 Visual Environment

The visual character of the environments through which the corridor would traverse is characterised by rural settlements, cultivated, low mountains and conservation areas.

8.12 Air Quality

Several activities associated with power line construction can cause particulate matter and gases to enter the atmosphere and degrade air quality. Particulate matter originates from smoke from the open burning of waste vegetation as well as from dust generated by construction activities. Gaseous hydrocarbons and oxides of sulfur and nitrogen are emitted from vehicle exhaust and open burning. The impact that these air pollutants have on sensitive persons or crops depends on topographic and meteorological factors, as well as the amount of each pollutant emitted. Residential and commercial sources include emissions from the following sources categories: wood stoves, backyard burning, and household heating. And commercial sources include emissions from the following categories: Land clearing burning, unregistered restaurants, dry cleaning, building construction, aluminium pot manufacturing and demolitions.

8.13 Socio-Economic Environment

According to Tony Barbour, 2007, there is a need to understand the social environment and communities affected by the proposed development to ensure that positive benefits associated with the project are enhanced and the negative impacts are avoided or mitigated. There is therefore a need to collect baseline data on the current social environment and historical social trends. This section, therefore, covers the socio-economic profile of the area at a local and regional level. Desktop review of the Vhembe District Municipality and Thulamela Local Municipality Integrated Development Plans and documents pertaining to the project area were consulted.

8.13.1 Population

According to Stats SA, community survey 2016, the district has a population of **1 393 949** which was about **1 294 722** in the Census 2011. This means the population of Vhembe District Municipality has increased by **99 227** people which is a growth rate of **0.8%.**

Thulamela Local Municipality's population decreased from **618 462** in Census 2011 to **497 237** according to Stat SA 2016 community survey results. This means the population has decreased by 121 225 and according to Thulamela LM, IDP, this was a result of demarcation changes. The table below

shows the population growth trends in Vhembe District and local municipalities since 1996. (Vhembe District Municipality, 2022)

Table 8-6: Population Growth Rates

Municipalities	1996	2001	% Change	2011	% change	2016
Vhembe	1 095 728	1 197 952	1.8	1 294 722	0.8	1 393 948
Thulamela	533 757	581 487	1.7	618 462	0.6	497 237

Source: Stats SA, Community Survey 2016

8.13.2 Gender

In most cases, there are more females than males in municipalities, this has also been shown in Vhembe DM and Thulamela LM, where there are more females households than males. This could be attributed to more women households being left behind to take care of families while men are looking for job opportunities in other places. The table below shows the number of households between the two municipalities.

Table 8-7: Number of Households

Municipality	Male	Female	Totals
Vhembe	187378	194980	382358
Thulamela	64593	65728	130321

Source: Vhembe DM IDP

8.13.3 Language

According to the 2011 census, the majority of Vhembe District, **67.2%** speak Tshivenda, followed by Xitsonga with **24.8%**, while Northern Sotho, Afrikaans and other languages are **1.6%, 1.3%** and **5.1%** respectively. Whereas in Thulamela LM, Tshivenda and Xitsonga are also the two dominant languages by **63.6%** and **32.9%,** with other languages contributing only **3.5%** of the total district population.

8.13.4 Level of Education

Community survey in 2016 showed that the level of education is average with **14.4%** adult age group who are illiterate (no schooling), and the majority **25.0%** completed matric while only **9.6%** have completed higher education within Vhembe District Municipality.

8.13.5 Employment Profile

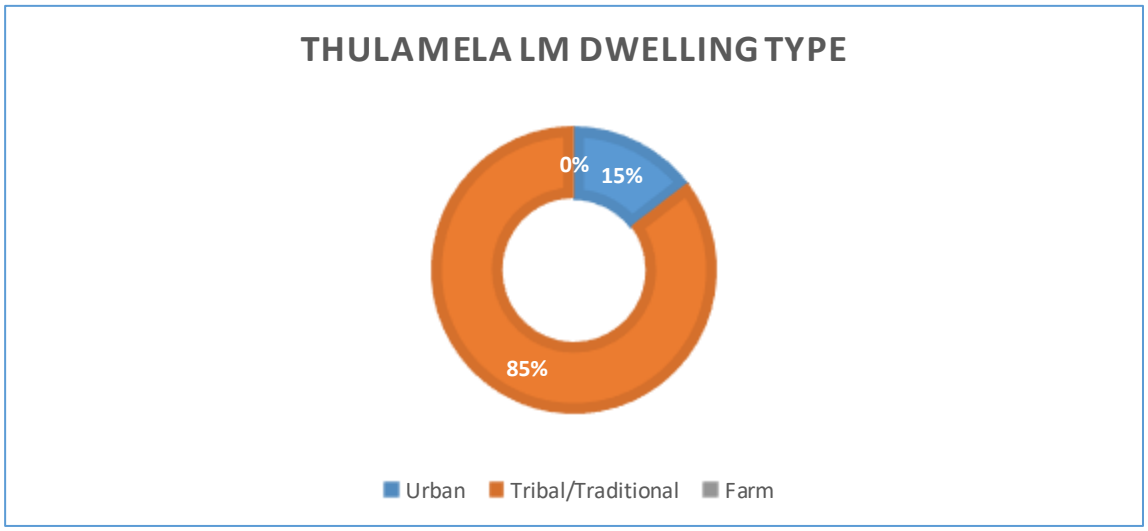
The municipality's economic growth potential is in agriculture and eco-tourism. Most people in the district derive their livelihood through agricultural pursuits. The main occupation sector is agriculture (commercial and subsistence) according to Census 2011. The stats show that **12.2%** of the municipal population were employed, **9.5%** were unemployed, whereas **5.4%** were discouraged job seekers and the majority **31.6%** were not economically active in the Thulamela LM. The total unemployment rate is 43.8% and 58.3% is the youth according to Census SA 2011.

8.13.6 Households by Dwelling Type

2016 Community Survey indicates that the main types of dwellings within Vhembe District and most people 299 772 are living in a formal dwelling/house or brick/concrete block structure, informal dwellings/shack in backyard is 7 363 and informal dwelling/shack not in the backyard (squatters) number is 3 481.

8.13.6.1 Formal Urban Settlements

Most of these households live in houses or brick/concrete block structures, which make up 85% of Thulamela LM total households as shown in the chart below. These mostly have a formal structure with a full access range of municipal services such as water, electricity, and waste collection. Others may also have security and tenure status.



Source: Stats SA (2011)

8.13.6.2 Tribal Settlements

The tribal households follow the formal urban settlements households for about 15%. There are about 6754 households that live in tribal settlements in Thulamela LM out of 39276 of the Vhembe district municipality.

8.13.6.3 Rural Settlements

The Rural settlements are similar to the tribal settlements regarding the residential densities and functions, but they are not located on tribal land. There are Informal dwellings/shacks in the backyard within Thulamela LM mostly in Thohoyandou.

8.13.7 Access to Services

8.13.7.1 Energy

Eskom provides Free Basic Electricity (FBE), which is the amount of electricity, deemed sufficient to provide basic electricity services to low-income households. Local municipalities identify beneficiaries for FBE as per their indigent policy for Eskom to allocate monthly 50kWh of FBE, through its prepaid and conventional meters. Monthly FBE Tokens do not accumulate; uncollected tokens forfeit monthly. In Thulamela LM, the Municipality currently provides 14083 households with free basic electricity coupons. Source: (Thulamela LM IDP 2018-2019) & (Vhembe District IDP 2019-2020)

8.13.7.2 Water

Vhembe District Municipality (VDM) is the Water Services Authority (WSA) and provider for all four (4) local municipalities Musina, Makhado, Thulamela, and Collins Chabane within its jurisdiction. As a Water Services Authority, the district has the responsibility to ensure the provision of safe drinking water. The district also has a Basic Water and Sanitation Service Policy to manage the provision of basic water to indigent people. The free basic water is 6kl per month per household. The local municipalities invoice the district for their monthly free basic water expenditure. In Thulamela LM, 26 850 households have access to free water services.

8.13.7.3 Toilet Facilities

Within the District, most of the rural areas have pit toilets. Many households in the rural areas in the VDM have VIP (pit toilets with ventilation) from the project implementation that is done each year. Only a few of the more urban settlements such as Thohoyandou, Louis Trichardt, Makhado, Musina, Mutale, Vuwani and Malamulele have water-borne sewer systems. There are no chemical toilets in the Vhembe District. Comparing the local knowledge to the data sets many discrepancies were found according to District IDP.

8.13.7.4 Refuse Removal and Waste Disposal

Thulamela municipality has an Integrated Waste Management plan to deal with waste management issues. The service is rendered by the municipality. Waste collection in the Municipality is characterized by urban and rural areas. Thulamela municipality collects 5761 cubic metres respectively. Waste collection in rural areas is not done systematically therefore villages in rural areas constitute a backlog. There are transfer stations that are established in Rural Areas namely Tshikombani, Tshaulu and Makonde and have licensed (Muledane-Tswinga) and (Gundani and Makwilidza) disposal sites. The

collection is done once a week in the proclaimed areas and every day in the CBDs. (Thulamela LM IDP 2018-2019).

8.13.8 Tourism

The district developed a tourism strategy to assist in designing an effective Marketing Plan and Strategy and identify appropriate Marketing Tools, to achieve maximum exposure and awareness for the Vhembe District Municipal region. The district has a variety of natural tourism attractions and is also rich in cultural activities.

8.13.8.1 Tourism Attraction Destinations

Tourism destinations in Vhembe District: Vhembe Biosphere Reserve, Nwanedi Conservancy, Western Soutpansberg tourism plan, Lake Fundudzi, Matshakatini, Nandoni Dam, Breathing stone on Tswime mountain, Komatiland forests, Mutale gorge, Mukumbani waterfall, Tshatshingo Potholes, Mandadzi waterfall, Big Tree, Dongodzivha Dam, Tshavhadinda cave, Tshipise Sagole, Aventura Tshipise, Route development, Archaeological and heritage sites, and Trans frontier parks, Mapungubwe heritage site.

8.13.8.2 Tourism Activities

Several activities or events are done on an annual basis such as Golf Tournaments, Cycle Centre Challenge, Land of Legends Marathon, Two Countries Marathon, Powerade Kremetart Cycle Race, 4x4 challenges in Thathe Vondo and Tshipise. There is one first-division team which brings about nine soccer matches per season to the district. The district tourism development has also been boosted by Zion Apostolic Church (Moriri) in Nzhelele, two TFCAs, one bordering Botswana and Zimbabwe, and the other one bordering Mozambique and Zimbabwe.

9 POTENTIAL IMPACTS AND DETERMINATION OF SIGNIFICANCE

This section of the report evaluates the possible negative and positive impacts which may occur because of going ahead with the proposed project. Potential environmental impacts have been identified based on the following:

- A review of the proposed activity; and
- The nature of the receiving environment.

Risks and key issues were identified through an internal process based on similar developments and site visits. Reference is made to the Table below for the environmental aspects used to identify the significant impacts:

Table 9-1: Identification of Significant Impacts

Environmental Feature	Component	Possible Construction effect envisaged?	Possible Post construction effect envisaged	Main effect?	Likely Significant Effect?	Comments/reason for inclusion or exclusion from further consideration
BIODIVERSITY (Flora and Fauna)	Habitat types	Y	Y	Y	Y	Loss of habitats
	Plant communities	Y	Y	Y	Y	Clearing of vegetation including protected/species of conservation concern
	Animal communities	Y	Y	Y	Y	Habitat transformation can cause displacement of animal/avi-fauna species.
	Conservation	Y	Y	Y	Y	Potential effects on the conservation/ protected species.
SOIL/LAND	Erosion	Y	Y	Y	?	Earthworks to be carried out
	Ground contamination	Y	Y	Y	?	Mainly caused by spillage of hazardous substances.
	Soils /agricultural land quality	Y	Y	Y	Y	Loss of agricultural land and movement of soils.
LAND-USE	Agriculture	Y	N	Y	N	Loss of agricultural land
	Conservation Areas	Y	Y	Y	Y	Construction and operation will occur in conservation areas
WATER ENVIRONMENT	Surface water quality	Y	Y	Y	Y	Pollution during construction and run-off from cleared areas
	Groundwater quality	Y	Y	Y	Y	Pollution during construction and run-off from cleared areas
WASTE	Waste management	Y	N	N	N	Waste generated during

Environmental Feature	Component	Possible Construction effect envisaged?	Possible Post construction effect envisaged	Main effect?	Likely Significant Effect?	Comments/reason for inclusion or exclusion from further consideration
						construction will need to be managed
	Waste characteristics	Y	N	N	N	Waste generated changes from agricultural in some areas to construction waste.
AIR	Local air quality	Y	N	N	N	Increased emission of NO_2 and PM_{10}on the local road network.
	Particulates and dust	Y	N	N	N	Dust generated during earthworks.
	Odor	Y	N	N	N	Odor expected from waste and sanitation systems during construction.
ARCHAEOLOGY	Burial areas	Y	Y	Y	Y	There are graves within the corridors
	Objects/buildings more than 60 years old	Y	Y	Y	Y	Potential for buildings/ objects within corridor.
VISUAL	Landscape character	Y	Y	Y	Y	Introduction of towers in highly sensitive landscape resulting in negative impacts on its character.
	Landscape quality	Y	Y	Y	Y	Eroding of landscape quality by inappropriate developments.
	Land-cover	Y	Y	N	N	Removal of vegetation
NOISE	Noise	Y	N	N	N	Noise will be generated during earthworks and construction. Corona expected during operation.
	Vibration	Y	N	N	N	Potential for vibration.
SOCIO-ECONOMIC	Employment	Y	N	Y	Y	The development will create jobs within the local and regional areas.
	Public health and safety	Y	N	Y	N	Influx of workers may introduce diseases and the construction activities will result in accidents and thefts.
	Local environment amenity	Y	Y	Y	Y	The influx of construction workers may cause minimal constraints on local amenities
	Standard of living	Y	N	Y	Y	Standard of living within the area may improve during the construction phase.

Key: Y=Yes N=No ? =Uncertain

9.1 Characteristics of Environmental Impacts

The significance of an impact is an expression of the cost or value of an impact to society. Impacts are divided according to phases: pre-construction, construction, operation, and decommissioning phase. The following parameters have been used to assess the identified environmental impacts:

Table 9-2: Impact Assessment Methodology

The impacts are assessed as either having a: negative effect (i.e., at a `cost' to the environment), positive effect (i.e., a `benefit' to the environment), Neutral effect on the environment.
Extent of the Impact (1) Site (site only), (2) Local (site boundary and immediate surrounds), (3) Regional (within the City of Johannesburg), (4) National, or (5) International.
Duration of the Impact The length that the impact will last for is described as either: (1) Immediate (<1 year) (2) Short term (1-5 years), (3) Medium term (5-15 years), (4) Long term (ceases after the operational life span of the project), (5) Permanent.
Magnitude of the Impact The intensity or severity of the impacts is indicated as either: (0) None, (2) Minor, (4) Low, (6) Moderate (environmental functions altered but continue), (8) High (environmental functions temporarily cease), or (10) Very high / Unsure (environmental functions permanently cease).
Probability of Occurrence The likelihood of the impact actually occurring is indicated as either: (0) None (the impact will not occur), (1) Improbable (probability very low due to design or experience) (2) Low probability (unlikely to occur), (3) Medium probability (distinct probability that the impact will occur), (4) High probability (most likely to occur), or (5) Definite.

Reversibility
The degree to which an impact is reversible:
(1) Completely reversible
(2) Partly reversible
(3) Barely reversible
(4) Irreversible

9.1.1 Significance

The potential impacts are assigned a significance rating (S), based on the information in the table above. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". The impact rating process is designed to provide a numerical rating of the various environmental impacts identified by use of the Input-Output model. The assessment of the identified impacts considers the specialists' assessments and EAP's professional experience with regards to the proposed development. The significance of the impacts is defined in consideration of legislation in the context of the environmental aspect and issues identified through public/stakeholder consultation. The significance rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact. **S=(E+D+M) P**

The legend for impact significance is indicated in the Table below.

Table 9-3: Legend for Impact Significance

	Significance	Description of Significance
(<30)	Low	The activity will have a low impact in the environment. This impact would not have a direct influence on the decision to develop in the area.
(30-60)	Medium	Medium Impact – the activity will have a medium impact on the environment. The impact could influence the decision to develop in the area unless it is effectively mitigated.
(>60)	High	The activity will have a high impact on the environment. The impact must have an influence on the decision process to develop in the area.

9.2 The Assessment of Environmental Impacts and Risks

The proposed power line and substation will result in many positive and negative impacts. Mitigation measures have been provided for the negative impacts identified. The mitigation measures should be implemented in line with the Mitigation hierarchy as described by the DEA (2013). Refer to Figure 9-1

below for the Mitigation Hierarchy. This section is largely based on the recommendations by specialists and EAP's experience on similar projects.

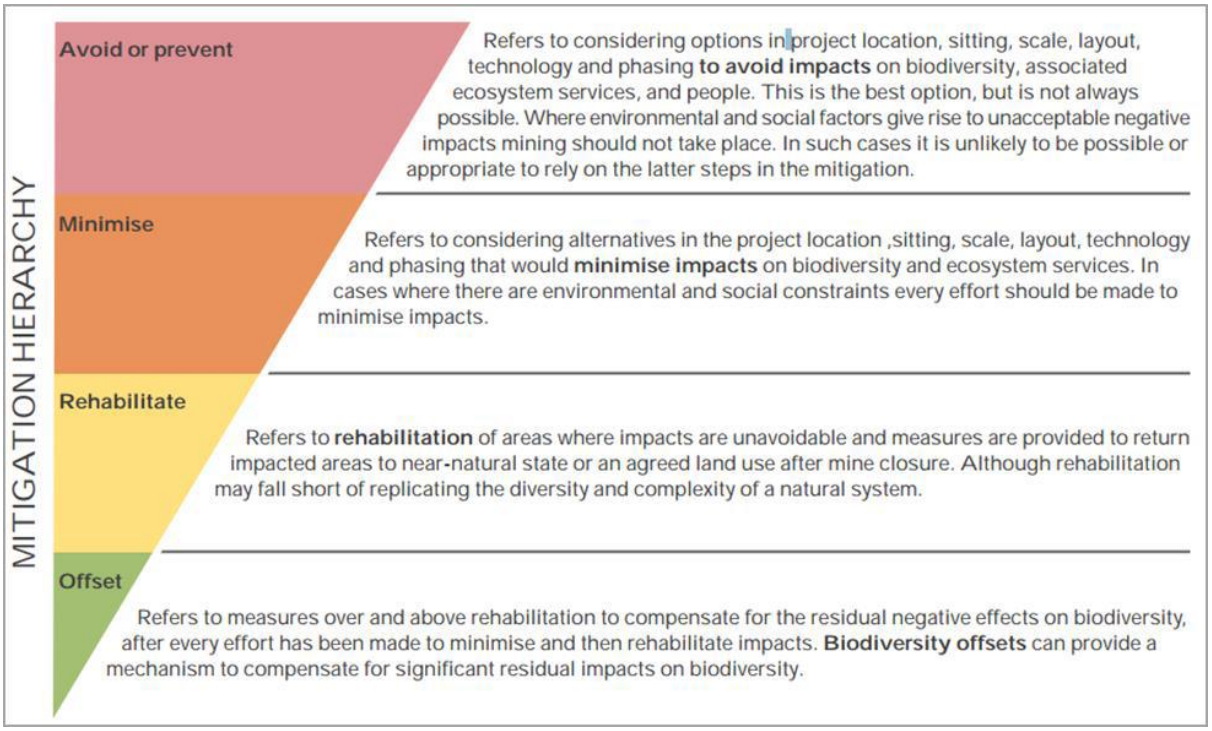


Figure 9-1: Mitigation Hierarchy as described by the DEA (2013)

The two corridors and four substation sites are in a similar environment and all the substation alternatives are within the 1km corridor assessed for the powerlines. The impact assessment below is for the project area. It should also be noted that mitigations measures given in the tables below are not exhaustive as they are fully discussed in the generic EMPrs attached in Appendix H-1 and H-2.

9.2.1 Pre-Construction

Table 9-4: Encroachment of Infrastructure into freshwater ecosystem

Phase	**Pre-Construction**
Listed Activities	Listing Notice 1: Activity 11, 19; Listing Notice 2: 4 (e) (i) (gg), 14(ii) (c) (e) (i) (ff) (hh)
Impact	Encroachment of infrastructure into freshwater ecosystems
Description of Impact	Two streams have been, and wetlands have been identified within corridor along the proposed power line route. As such, one of the main potential impacts of the proposed power line on freshwater ecosystems is the placement of power line pylons within or near freshwater ecosystems. Another, related, potentially negative impact is the construction of

	new access roads through freshwater ecosystems located between pylons.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	4	4
Intensity	6-8	4
Probability	4	3
Reversibility	4	2
Significance	**Moderate (-48 to -56)**	**Medium (-30)**
Reversibility	PR	
Mitigation Measures	✓ Where possible, no infrastructure (such as pylon structures and new access roads) should be established within the recommended buffer areas for the freshwater ecosystems mapped along the proposed route. ✓ A water use licence / General Authorization is required before constructing within a 500m regulated area as per the National Water Act or within 1:100-year floodline of Mutale River.	

Table 9-5: Site Specific Walkdown

Phase	**Pre-Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19, 27; Listing Notice 2: 4 (e) (i) (gg), 12(e), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Destruction of sensitive resources due to not undertaking a site-specific walk-down assessment before commencement of construction activities.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	1
Duration	5	2
Intensity	8	4
Probability	3	2
Reversibility	4	1
Significance	**Moderate (-48)**	**Low (-14)**
Mitigation Measures	✓ The heritage, avifauna and ecology specialists should complete a “walk down” assessment of the final selected power line points, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This	

	walks down assessment will document all sites, features and objects, to propose adjustments to the tower positions and thereby to avoid as many impacts as possible sensitive areas/features.

Table 9-6: Environmental Awareness

Phase	**Pre-Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19, 27; Listing Notice 2: 4 (e) (i) (gg), 12(e), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Non-compliance with authorizations, permits and licenses due to poor or no Environmental awareness training	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	1
Duration	3	2
Intensity	8	2
Probability	4	2
Reversibility	2	1
Significance	**Moderate (-52)**	**Low (-10)**
Mitigation Measures	✓ All personnel and contractors should undergo Environmental Awareness Training. ✓ The induction is to include aspects such as the EMPr conditions, project permits conditions, need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”. ✓ The training should focus on the compliance of the conditions of the Environmental Authorization (EA), Environmental Management Programme (EMPr), and any other relevant permits and licenses. ✓ A signed register of attendance must be kept for proof. ✓ Awareness posters should be placed on the site notice board or any other placed allowed on site. ✓ Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the possible presence of protected trees, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorization and within the EMPr. ✓ The avoidance and protection of the surrounding watercourses and riparian areas must be included into a site induction. ✓ Contractors and employees must all undergo the induction and be made aware of the areas to be avoided. ✓ The Contractor must provide method statements on the protocols to be followed and	

	contingencies to be implemented. Training on Cultural and Heritage Aspect ✓ Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the construction phase. The pre-construction training should include some site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some indicators of an archaeological site that may be found during construction.

9.2.2 Construction

Table 9-7: Fragmentation of CBAs and ESAs

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)	
Impact	Fragmentation of CBAs and ESAs.	
Description of Impact	Vegetation clearance will be done in CBAs and ESA resulting in habitat fragmentation especially where the corridor traverses across the mountain and at the substation site.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	4	2
Intensity	8	6
Probability	4	3
Reversibility	4	4
Significance	**Medium (-60)**	**Medium (-33)**
Mitigation Measures	✓ Where possible, the powerline and substation should be limited to existing developed / degraded footprints. ✓ Areas of high ecological sensitivity should be demarcated as 'no-go' areas. ✓ Existing roads should be used where possible. ✓ Towers should be well placed to lower the need for clearing the whole corridor/ servitude.	

Table 9-8: Destruction of Protected and Indigenous Species

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)	
Impact	Destruction of protected and indigenous flora species	
Description of Impact	Various protected species (Sclerocarya birrea, Philenoptera violacea, Combretum imberbe, Afzelia quanzensis and Adansonia digitata) were noted within the corridors and substation footprint where vegetation clearance will be done.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	2	2
Intensity	6	4
Probability	4	2
Reversibility	4	2
Significance	**Medium (-40)**	**Low (-14)**
Mitigation Measures	✓ No construction or clearing can commence prior to receiving a valid permit for the cutting and/or trimming of protected trees. Where possible the protected trees such as Adansonia digitata and Sclerocarya birrea, Philenoptera violacea, Breonadia salicina, Combretum imberbe noted on-site must be avoided otherwise a tree permit is required prior to pruning. ✓ A tree marking walk down must be carried out to quantify the type and quantity of protected trees within the line corridor. DAFF will also require that Eskom complete an offset for the trees cut. ✓ The ECO should be present in an advisory capacity during tree removal. ✓ Limited plants need to be removed when clearing the servitude for the new power line. ✓ Clear guidelines and proper plans must be given to the contractor and inspections should be cleared out daily during the clearing activities.	

Table 9-9: Introduction of Alien Species

Phase	Construction	
Listed Activities	Listing Notice 1: Activity 11, 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)	
Impact	Introduction and proliferation of alien vegetation	
Description of Impact	Alien species have been noted in some sections of the corridors and the clearance of vegetation and movement of plant may spread these species to other areas.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	5	1
Intensity	6	2
Probability	3	2
Reversibility	4	2
Significance	**Medium (-39)**	**Low (-10)**
Mitigation Measures	✓ Alien vegetation should be removed from all sites on a regular basis. ✓ An alien vegetation monitoring and control plan should be compiled and implemented during the operational phase of the project. ✓ Disturbed areas around the construction sites should be re-vegetated.	

Table 9-10: Displacement of SCC and non- SCC Avifauna

Phase	Construction
Listed Activities	Listing Notice 1: Activity 11, 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)
Impact	▪ Displacement of SCC and non-SCC priority species because of habitat loss & transformation at the proposed Mutshikili substation. ▪ Displacement of SCC and non-SCC priority species because of habitat loss & transformation during the construction of the powerlines.
Description of Impact	Habitat will be cleared to accommodate the Mutshikili Substation reducing the amount of habitat available to birds for foraging, roosting, and breeding which could result in temporary or permanent displacement. The direct habitat transformation will be limited to the tower footprints and the narrow access road/track under the power line. The habitat in the study area is highly uniform and largely transformed in places, with low SCC abundances.
Status	Negative

	Substation		Powerlines	
	Without Mitigation	**With Mitigation**	**Without Mitigation**	**With Mitigation**
Extent	1	1	1	1
Duration	4	4	2	2
Intensity	6	4	4	2
Probability	2	2	2	2
Reversibility	2	1	2	1
Significance	**Low (-22)**	**Low (-18)**	**Low (-14)**	**Low (-10)**
Mitigation Measures	✓ Avoid removal of sensitive vegetation types. The recommendations of the botanical study must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned. ✓ Construction activity should be restricted to the immediate footprint of the infrastructure. ✓ All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment. ✓ All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction. ✓ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.			

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)	
Impact	Displacement of SCC and non-SCC priority species because of disturbance	
Description of Impact	Excavation and construction activities are a source of significant disturbance particularly because of the machinery and construction personnel that are present on site for the duration of the construction of the Mutshikili Substation and 132kV power line.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	2	2
Intensity	6	4
Probability	3	2
Reversibility	2	1
Significance	**Medium (-30)**	**Low (-14)**

Mitigation Measures	✓ An avifaunal walk through of the final substation footprint and power line alignment should be conducted prior to construction, to identify any species that may be breeding on the site or within the immediate surrounds and to ensure that any impacts likely to affect breeding species (if any) are adequately managed. ✓ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. ✓ Measures to control noise should be applied according to current best practice in the industry.

Table 9-11: Loss of agricultural land and soil potential

Phase	**Construction and Operation**	
Listed Activities	Listing Notice 1: Activity 11, 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii)	
Impact	Loss of agricultural land and soil potential	
Description of Impact	▪ The installation of powerlines often requires the acquisition of land, leading to land use restrictions for farmers. This can affect the available agricultural land, reducing the area for cultivation and potentially affecting crop rotation practices. ▪ The allocation of land for electricity substations can result in the fragmentation of agricultural land, leading to reduced farm sizes. ▪ The construction and operation of electricity substations and powerlines may lead to soil compaction, disturbance, and erosion, affecting soil fertility and nutrient availability. ▪ Due to the short duration of construction and the small footprint of the towers, it is anticipated that there will be minimal residual impacts on land use. A very small area of land will be disturbed during construction for structure installation, i.e., tower footprint.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	1	1
Intensity	4	4
Probability	4	3
Reversibility	3	2
Significance	**Low (-28)**	**Low (-18)**
Mitigation Measures	✓ Keep the surface disturbance footprint as small as possible. ✓ Soil nutrient cycles can somehow be maintained by revegetation of topsoil stockpiles and through proper ecological land rehabilitation.	

	✓ Rehabilitation of land can restore the grazing capacity to a large extend

Table 9-12: Soil Erosion and Dust Emissions

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19, 27; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Soil Erosion Increased dust emissions.	
Description of Impact	▪ Vegetation clearance exposes the soil surface to the energy of wind and water movement. ▪ Increased dust emission due to construction activities including plant movement and excavations.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	2	1
Intensity	6	4
Probability	4	2
Reversibility	4	2
Significance	**Medium (-40)**	**Low (-12)**
Mitigation Measures	✓ No surface storm water generated because of the development may be directed into any natural drainage system or wetland. ✓ A surface runoff and storm water management plan, indicating the management of all surface runoff generated because of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g., storm water and flood retention ponds). ✓ To minimize artificially generated surface storm water runoff, total sealing of paved areas such as parking lots, access roads, pavements and walkways should not be permitted. ***Permeable material should rather be utilized for these purposes***. In addition, runoff rainwater from all roofs must be managed to prevent erosion. ✓ No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase. ✓ An on-site ecological management plan must be implemented for drainage lines including management recommendations as well as potential rehabilitation of disturbed areas.	

	✓ Limited traffic during construction. ✓ Progressive rehabilitation during construction. ✓ Use existing roads as access roads – limit grading of new roads (loss of habitat and natural vegetation ✓ Concern is the area where the proposed power line will cross the mountain – high to very high erosion risk (not a viable route to follow) ✓ Dust minimization and control measures should be implemented at the construction site at regular intervals. This includes wetting of exposed soft soil surfaces. ✓ No water may be abstracted from any water source without an applicable License from the Department of Water and Sanitation (DWS). ✓ The frequency of implementation of dust suppression measures should be increased when it is expected that high wind conditions will develop.

Table 9-13: Loss of wetland features habitat and ecological structure

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19, Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Loss of Wetland features habitat and ecological structure.	
Description of Impact	▪ Site clearing and the removal of vegetation lead to increased runoff and erosion during rainfall events. ▪ Potential indiscriminate driving through wetland feature areas leads to soil compaction. ▪ Earthworks in the vicinity of the wetland feature system leading to loss of wetland feature habitat, erosion and altered runoff patterns. ▪ Changes to the wetland feature vegetation community due to alien invasion resulting in altered wetland feature conditions.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	3	1
Intensity	8	4
Probability	3	1
Reversibility	4	2
Significance	**Medium (-39)**	**Low (-7)**

Mitigation Measures	✓ Ensure that vegetation clearing, and indiscriminate vehicle driving does not occur outside of the demarcated areas. ✓ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities. ✓ Implement alien vegetation control program within the wetland features. ✓ Ensure that all activities impacting on the wetland features are managed according to the relevant DWS Licensing regulations (where applicable). ✓ As far as possible, all construction activities should occur in the low flow season, during the drier winter months. ✓ Any areas where active erosion within the wetland features is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is reinstated to conditions which are as natural as possible. ✓ Cutting/ clearing of the herbaceous layer within the wetland areas along the linear development should be avoided to retain soil stability provided by the grass root structures.

Table 9-14: Changes to Ecological and Socio-Cultural Services Provision

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Changes to Ecological and Socio-Cultural Services Provision	
Description of Impact	▪ Loss of phosphate, nitrate, and toxicant removal abilities due to vegetation clearing. ▪ Inability to support biodiversity due to vegetation clearing and contamination of wetland feature soils and water because of waste rubble dumping, increased sedimentation, and alteration of natural hydrological regimes. ▪ Earthworks within the wetland features leading to loss of flood attenuation abilities and streamflow regulation capabilities. ▪ Unmanaged oil leaks from construction vehicles leading to water quality deterioration.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	2	1
Intensity	4	4
Probability	4	1
Reversibility	4	2

Significance	**Low (-28)**	**Low (-7)**
Mitigation Measures	✓ During construction use techniques which support the hydrology and sediment control functions of the freshwater features, and normal as soon as possible after construction. ✓ Limit excavations to a limited extent to ensure that drainage patterns within the features returns to pre- development status. ✓ Restrict construction to the drier winter months, if possible, to avoid sedimentation of the freshwater feature and to minimize the severity of disturbance of the features and hydraulic function. ✓ Monitor the wetland feature for erosion and incision. ✓ Maintain the REC for each of the wetland features; and ✓ Implement an alien vegetation control program within the wetland features and ensure establishment of indigenous species within areas previously dominated by alien vegetation.	

Table 9-15: Loss of hydrological function and sediment balance

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19; Listing Notice 2: 4 (e) (i) (gg), 12e(ii)(iii), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Loss of hydrological function and sediment balance	
Description of Impact	▪ Site clearing and further removal of vegetation resulting in increased runoff which leads to erosion and alteration of the geomorphology of the wetland features. ▪ Disturbance of soils, topsoil stockpiling adjacent to the wetland features and runoff from stockpiles leading to sedimentation of the system. ▪ Earthworks in the vicinity of the wetland features leading to incision, erosion and altered runoff patterns. ▪ Movement of construction vehicles within the wetland features resulting in soil compaction.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	2
Duration	4	1
Intensity	8	4
Probability	4	1
Reversibility	4	2
Significance	**Medium (-60)**	**Low (-7)**

Mitigation Measures	✓ Any construction-related waste must not be placed in the vicinity of the wetland features. ✓ Limit the footprint area of the construction activity to what is essential to minimize environmental damage. ✓ Stockpiled soil must be removed, and the area must be levelled to avoid sedimentation of the wetland features from runoff. ✓ As far as possible, all construction activities should occur in the low flow season, during the drier summer months; and ✓ Vehicles should not be driven indiscriminately within the wetland features during maintenance activities to prevent soil compaction.

Table 9-16: Pollution of freshwater ecosystems and disturbance of aquatic fauna

Phase	**Construction**	
Listed Activities	Listing Notice 1: Activity 11, 19; Listing Notice 2: 4 (e) (i) (gg), 14(ii) (c) (e) (i) (ff) (hh)	
Impact	Pollution of freshwater ecosystems. Disturbance to aquatic and semi-aquatic fauna.	
Description of Impact	▪ Pollution of freshwater ecosystems through the runoff of contaminants such as fuel, oil, concrete, wash-water, sediment, and sewage into these ecosystems. ▪ Increased disturbance of aquatic and semi-aquatic fauna, because of the noise from construction teams and their machinery working within or near wetlands and rivers.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	2	2
Intensity	6	4
Probability	4	3
Reversibility	3	1
Significance	**Medium (-40)**	**Low (-24)**
Reversibility	PR	
Mitigation Measures	✓ All wetlands and drainage lines should generally be treated as “no-go” areas and appropriately demarcated as such. No vehicles, machinery, personnel, construction materials, cement, fuel, oil, or waste should be allowed into these areas without the express permission of and supervision by the ECO. ✓ Construction activities associated with the establishment of access roads through wetlands or drainage lines (if unavoidable) should be restricted to a working area 10 m in width either side of the road, and these working areas should be clearly demarcated. No vehicles, machinery, personnel, construction material, cement, fuel, oil, or waste should	

	be allowed outside of the demarcated working areas. ✓ Construction camps, toilets and temporary laydown areas should be located at least 30 m from the edge of any wetlands and drainage lines. ✓ No fuel storage, refueling, vehicle maintenance or vehicle depots should be allowed within 30 m of the edge of any wetlands or drainage lines. ✓ Refueling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, should be located on impervious bases, and should have bands around them. Bunds should be sufficiently high to ensure that all the fuel kept in the area will be captured in the event of a major spillage. ✓ Vehicles and machinery should not be washed within 30 m of the edge of any wetland or drainage line. ✓ No effluents or polluted water should be allowed to discharge into any drainage lines or wetland areas.

Table 9-17: Heritage Resources

Phase	**Construction**	
Impact	Damage to archaeological objects	
Description of Impact	Damage to archaeological objects may occur during excavation at tower sites, substation construction and during line stringing.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	1
Duration	4	2
Intensity	6	2
Probability	2	2
Reversibility	4	2
Significance	**Low (-24)**	**Low (-10)**
Mitigation Measures	✓ Familiarise all staff and contractors with procedures for dealing with heritage objects/sites. ✓ Care should be taken to conserve exposed archaeological objects in gullies. ✓ Any graves shall be clearly marked and treated as no go areas. Marked and unmarked graves were observed at the following co-ordinates. **S22° 43’ 51.8’’, E30°36’ 16.4’’** **S22° 43’ 39.8’’, E30°36’ 03.3’’** **S22° 43’ 52.6’’, E30°36’ 32.3’’**	

	S22° 43' 01.5'' E30°34' 42.3'' **S22° 43' 02.7'', E30°34' 47.9''** **S22° 43' 51.8'', E30°36' 16.4''** ✓ No destruction of any site shall be allowed. Should it be necessary to remove any graves, the necessary procedures shall be followed and permits obtained. ✓ Artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained, and the site has been mapped and noted. The permit must be obtained from the SAHRA Burial Ground and Graves (BGG) Unit.) in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) and Limpopo Provincial Heritage Regulations No. 103 of 2003. ✓ If the building is a designated historic structure, very close to such a structure, or located in a designated historic area, notification shall be made, and approvals/permits be obtained from SAHRA, and all construction activities planned and carried out in line with local and national legislation. ✓ It shall be ensured that provisions are put in place so that artifacts or other possible "chance finds" encountered in excavation or construction are noted and Eskom's, responsible officials contacted, and works activities delayed or modified to account for such finds. ✓ A heritage practitioner should complete a "walk down" of the final selected power line servitudes, the chosen deviation location, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible.

Table 9-18: Damage of fossil heritage objects

Phase	**Construction**	
Impact	Damage to fossil heritage objects	
Description of Impact	Damage/ destruction to fossil heritage resources during the excavations/ drilling at towers.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	1	1
Duration	5	5
Intensity	2	2
Probability	1	1

Reversibility	4	2
Significance	**Low (-8)**	**Low (-8)**
Mitigation Measures	✓ If fossils are found by the environmental officer, or other responsible person once excavations for pole foundations have commenced, then they should be rescued, and a paleontologist called to assess and collect a representative sample. ✓ The foundations should be monitored for any fossils once excavations have commenced. ✓ A Chance Find Protocol must be implemented where required.	

Table 9-19: Waste and Sewage Handling and Disposal

Phase	**Construction**	
Impact	Inadequate handling, storage and disposal of domestic, industrial waste and sewage resulting in odor, soil, surface, and ground water pollution	
Description of Impact	Construction activities will generate different types of waste and failure to handle, store or dispose of it will result in windblown litter, soil, and water pollution.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	2
Duration	3	3
Intensity	6	4
Probability	4	2
Reversibility	3	2
Significance	**Medium (-48)**	**Low (-18)**
Reversibility	IR	
Mitigation Measures	✓ Formal waste management and sewerage systems must be put in place for contractors. ✓ Waste management must be a priority and all waste must be collected and stored effectively. ✓ No dumping of litter, rubble or cleared vegetation on site should be allowed. Infrastructure and rubble removed because of the construction activities should be reduced, re-used, or recycled with disposal to landfill as last resort. ✓ No temporary dump sites should be allowed in areas with natural vegetation. It is advised that waste disposal containers and bins be provided during the construction phase for all construction rubble and general waste. ✓ Vegetation cuttings must be carefully collected and disposed of at a separate	

	waste facility. ✓ Well labelled refuse bins must be placed in strategic positions to ensure that litter does not accumulate within the construction site. ✓ Burying of any waste including rubble, domestic waste, empty containers on the site should be strictly prohibited. ✓ All construction rubble waste and any other types of waste must be removed and disposed of at a suitable authorized disposal facility. ✓ Contractors and construction crew conducting the works on site should be informed about approved waste disposal facilities. ✓ The skips and bins should be properly marked to indicate the type of waste that should be stored. ✓ Waste should be stored in approved areas. ✓ It is recommended that all waste be removed from the site on a weekly basis to prevent rodents and pests entering the site. ✓ The Contractor should supply sealable and properly marked domestic waste collection bins or skips and all solid waste collected shall be disposed of at a registered waste disposal site. ✓ Where a registered disposal facility is not available close to the project area, the Contractor shall provide a method statement regarding waste management. ✓ Under no circumstances may domestic waste be burned on site. ✓ Temporary storage of domestic waste shall be in covered waste bins/skips. ✓ No dumping of construction material on-site may take place. ✓ All waste generated on-site during construction must be adequately managed. Separation and recycling of different waste materials should be supported. ✓ Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. The use of these facilities must be enforced. ✓ The toilets should be anchored to prevent them from being blown by the wind. ✓ A minimum of one toilet must be provided per 10 people. ✓ Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area. ✓ The toilets must be kept clean so that they are a desired alternative to the surrounding vegetation. ✓ All staff on site should use the toilets. ✓ Safe Disposal Certificates (SDC) for sewage disposal should be provided to the Environmental Control Officer and filed on site.

Table 9-20: Landscape Character

Phase	**Construction**	
Impact	Landscape Character	
Description of Impact	The area is largely characterised of residential, subsistence farming and natural areas associated with the mountain. The presence of the construction camp and activities during construction will have an impact on the landscape character.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	1	1
Intensity	6	4
Probability	4	2
Reversibility	4	4
Significance	**Medium (-36)**	**Low (-14)**
Mitigation Measures	✓ Keep disturbed areas to a minimum. ✓ No clearing of land to take place outside the demarcated footprints; and ✓ The contractor should maintain good housekeeping on site to avoid litter and minimise waste.	

Table 9-21: Waged Labor

Phase	**Construction**	
Impact	Waged labour	
Description of Impact	This project will thus result in few local employment, and there will thus be limited short-term positive impacts to the communities. These will mostly be of low skill such as clearance of the servitude and excavation of foundations.	
Status	Positive	
	Without Mitigation	**With Mitigation**
Extent	3	2
Duration	1	1
Intensity	4	8
Probability	3	4
Significance	**Low (12)**	**Medium (44)**
Mitigation Measures	✓ Representatives from the various local municipalities could assist in determining local subcontractors and laborers that should be considered for possible employment. ✓ The tender document should specify the use of local laborer's or enterprises (where possible). It should be stipulated in the tender documentation that contractors use local laborers for manual and low skilled activities such as fencing and bush clearing. Where possible, on-site training should be undertaken to ensure long term benefits to the members of the community.	

Table 9-22: Capacity and Skills Development

Phase	**Construction**	
Impact	Capacity and skills development	
Description of Impact	It is predicted that the construction of the proposed project will lead to capacity building in the community, as this project may open opportunities for residents through training, coaching and skills transfer. It is suggested that all employees be trained in the function of their job and that such training should also incorporate health, safety, security, and environmental aspects.	
Status	Positive	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	1	1
Intensity	4	6

Probability	2	4
Reversibility	4	4
Significance	**Low (16)**	**Medium (40)**
Mitigation Measures	✓ Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used.	

Table 9-23: Gender Division of Labor

Phase	**Construction**	
Impact	Gendered division of labor	
Description of Impact	South Africa has seen a strong push for gender equality in policy and decision making in both the public and private sectors. In 2015, the JSE introduced listing requirements compelling companies to have a policy for the promotion of gender diversity. If this project is seen favoring men over women, such will create social conflict.	
Status	Positive	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	1	1
Intensity	4	6
Probability	3	4
Significance	**Low (24)**	**Medium (40)**
Mitigation Measures	✓ Eskom's own internal policies and procedures should be used to ensure a fair and transparent recruitment process. ✓ Salaries of women should be equal to that of men when undertaking the same work. ✓ Training and skills development should take place for women. ✓ Institute a well-designed gender equality strategy, if not available.	

Table 9-24: Displacement and Relocation of Households

Phase	**Construction**	
Impact	Displacement and relocation of households	
Description of Impact	The displacement and relocation of households causes social and psychological disruption to those involved.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	1	1
Duration	5	5
Intensity	6	4
Probability	4	4
Reversibility	4	3
Significance	**Medium (-48)**	**Medium (-40)**
Mitigation Measures	✓ Negotiations should be approached with the necessary cultural sensitivity. ✓ Sufficient compensation and assistance with the relocation process. ✓ A Land Acquisition Process and Compensation Assessment and Action Plan must be developed.	

Table 9-25: Influx of workers

Phase	**Construction**	
Impact	Influx of workers resulting in conflicts with community	
Description of Impact	The development will transverse mostly in a rural area, as such the influx of jobseekers is rated as moderate as some local jobseekers might be unsuccessful in securing job opportunities, which could result in conflict between locals and some outsiders looking for employment. If construction workers are not sourced locally, but housed in the hosts' communities, this may further lead to conflict with locals. Conversely the presence of temporary workers could provide a small stimulus to the local economy if accommodation for such workers could be procured locally, this would provide local economy through rentals paid. The influx may also increase anxiety in the area as they may be seen as responsible for any criminal activities that take place during the construction phase.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2

Duration	1	1
Intensity	6	4
Probability	3	3
Reversibility	3	1
Significance	**Low (-27)**	**Low (-21)**
Mitigation Measures	✓ Employment should be made through local community structures.	

Table 9-26:Traffic

Phase	**Construction**	
Impact	Traffic congestion on public roads	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	2
Duration	1	1
Intensity	4	2
Probability	3	2
Reversibility	1	1
Significance	**Low (-24)**	**Low (-10)**
Mitigation Measures	✓ The current existing roads should be used to access the powerline. ✓ The necessary traffic control signage should be installed on site. ✓ Delivery of material be outside of peak hours to prevent traffic congestion. ✓ Should temporary roads be required, these should agree with the landowners. ✓ Powerline servitude road should be developed and used as per the agreement with the landowners. ✓ Reduce speed to prevent animal road kills.	

Table 9-27: Noise

Phase	**Construction**	
Impact	Movement of vehicles and some construction activities will result in noise	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	1	1

Intensity	4	2
Probability	3	2
Reversibility	1	1
Significance	**Low (-21)**	**Low (-10)**
Mitigation Measures	✓ Use noise barriers and equipment with low noise. ✓ Noise control plan should be prepared. ✓ Site vehicles and equipment should be regularly serviced and maintained in a good working order. ✓ Where necessary staff should be provided with ear plugs.	

9.2.3 Operation

Table 9-28: Mortality of SCC and non-SCC species due to collisions

Phase	**Operation**	
Activity	Listing Notice 1: Activity 11(i)	
Impact	Mortality of SCC and non-SCC priority species due to collision with the 132kV power line conductors/earthwires.	
Description of Impact	The collision of birds with the 132kV power line conductors/ wires.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	3	3
Intensity	6	4
Probability	4	2
Reversibility	1	1
Significance	**Moderate (-48)**	**Low (-20)**
Mitigation Measures	✓ The 132kV power line must be constructed using a bird friendly structure. ✓ Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.	

Table 9-29: Mortality of SCC and non-SCC species due to electrocutions

Phase	**Operation**	
Activity	Listing Notice 1: Activity 11(i)	
Impact	Mortality of SCC and non-SCC priority species because of electrocution on the 132kV power line infrastructure	
Description of Impact	Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	4	2
Intensity	6	4
Probability	3	1
Reversibility	1	1
Significance	**Moderate (-39)**	**Low (-9)**
Mitigation Measures	✓ High risk sections of the power line must be identified by a qualified avifaunal specialist during the walk-through phase of the project once the alignment has been finalized. If power line marking is required (i.e., in areas that contain drainage lines, open grassland-type habitat and water bodies) bird flight diverters must be installed on the full span length on each of the conductors (according to Eskom guidelines - five meters apart). Light and dark color devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as possible after the conductors and earth wires are strung.	

Table 9-30: Mortality of SCC and non-SCC species due to electrocutions at the substation

Phase	Operation	
Activity	Listing Notice 1: Activity 11 (i)	
Impact	Mortality of SCC and non-SCC priority species because of electrocution on the substation infrastructure.	
Description of Impact	Electrocution is when birds perch or attempt to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	4	2
Intensity	4	2
Probability	2	1
Reversibility	1	1
Significance	**Low (-22)**	**Low (-7)**
Mitigation Measures	✓ Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the Mutshikili Substation and 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership. ✓ Insulating material (if applied) to be maintained during the operational life span of the Mutshikili Substation and 132kV power line	

Table 9-31: Alteration of hydrology

Phase	Operation
Listed Activities	Listing Notice 1: Activity 11, 19; Listing Notice 2: 4 (e) (i) (gg), 14(ii) (c) (e) (i) (ff) (hh)
Impact	▪ Increased erosion and alteration of hydrology of freshwater ecosystems due to the placement of pylons. ▪ Increased erosion and alteration of hydrology of freshwater ecosystems due to the placement of access roads. ▪ Clearing and/or trimming of natural vegetation in and around freshwater ecosystems within servitude. ▪ Ongoing disturbance to aquatic and semi-aquatic fauna.
Description of Impact	▪ Increased erosion and alteration of the hydrology of drainage lines and wetlands, because of the establishment of distribution line towers within or immediately adjacent

	to these freshwater ecosystems. ▪ Increased erosion and alteration of the hydrology of drainage lines and wetlands, because of the establishment of access roads through these freshwater ecosystems. ▪ Clearing or trimming of natural vegetation in and around wetlands and drainage lines located within the servitude of the power line, as part of the routine maintenance operations. ▪ Noise- and lighting-related disturbance to aquatic and semi-aquatic fauna associated with freshwater ecosystems located near the proposed substation/s.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	4	4
Intensity	6	4
Probability	4	3
Reversibility	4	2
Significance	**Medium (-48)**	**Low (-48)**
Mitigation Measures	✓ Ensure that none of the pylons for the distribution line are located within any drainage lines or wetlands, and preferably that no pylons are located within the recommended buffer areas for these freshwater ecosystems. ✓ Use existing access roads wherever possible. In situations where the impact is unavoidable, it can be mitigated to some degree by formalizing road crossings over drainage lines and using properly designed structures that minimize the alteration of flows. ✓ Install adequate sub-surface drainage under any access roads for which the crossing of wetland areas is unavoidable. ✓ Where possible construct taller pylons in certain areas that are high enough to allow for the growth of relatively tall vegetation.	

Table 9-32: Landscape Character

Phase	Operation	
Impact	Landscape Character	
Description of Impact	The area is largely characterised of residential, subsistence farming and natural areas associated with the mountain. The existence of towers and substation will have an impact on the landscape character.	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	2	2
Duration	5	5
Intensity	6	4
Probability	4	4
Significance	**High (-65)**	**Medium (-55)**
Mitigation Measures	✓ Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape. ✓ Keep disturbed areas to a minimum. ✓ No clearing of land to take place outside the demarcated footprints; and ✓ The contractor should maintain good housekeeping on site to avoid litter and minimise waste.	

Table 9-33: Access to electricity

Phase	Operation	
Impact	Access to electricity	
Status	Negative	
	Without Mitigation	**With Mitigation**
Extent	3	3
Duration	4	5
Intensity	6	8
Probability	5	5
Significance	**High (65)**	**High (90)**
Mitigation Measures	✓ Eskom must regularly maintain infrastructure.	

9.2.4 Cumulative Impacts

Cumulative impacts entail identifying additional projects, activities, or disturbance features near the project—past, present, and future projects that may have impacts that could combine with the residual project impacts to increase environmental impact. This is done by reviewing the historical activity records, geographic data indicating existing disturbance features and the observation and knowledge of ongoing activities. Projects anticipated to be completed in the future include those that are now underway or have already started the Environmental Authorisation (EA) process, any permitting applications, or those that have been issued the required permits. Based on the above, the following developments have been noted within 5 km of the site.

This section addresses whether the construction of the proposed development will result in:

- Unacceptable risk
- Unacceptable loss
- Complete or whole-scale changes to the environment
- Unacceptable increase in impact

For this assessment the PAOI has been demarcated as 10km. Based on the Screening Report and the database for authorized renewable plants accessed from the DFFE website, there are no authorized RE plants near the site. In addition, on the projects that are listed in Thulamela IDP review, there are also no authorized projects near the site.

9.2.4.1 Agriculture

The construction of substations and powerlines often requires the acquisition of land, leading to the fragmentation of agricultural plots. This fragmentation can disrupt the continuity of farming operations, making it challenging for small-scale farmers to manage their land effectively. Fragmented plots may result in reduced efficiency, increased transportation costs, and difficulties in implementing crop rotation practices. Substations and powerlines constructed near the farms, will lead to small-scale farmers having difficulties in managing their fragmented plots, resulting in decreased productivity and increased labour requirements.

9.2.4.2 Avifauna

Cumulative Impact in relation to an activity, means the past, current, and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that may not be significant, but may become significant when added to existing and reasonably foreseeable impacts eventuating from similar or diverse activities. The role of the cumulative impact assessment is to determine if such impacts are relevant to the proposed project (i.e., whether the addition of the proposed project in the proposed areas will increase the impact). This section addresses whether the construction of the proposed development will result in unacceptable risk or loss, complete or whole-scale changes to the environment and/or unacceptable increase in impact.

The proposed 132kV power line equates to a maximum length of approximately 7.5km. There are at least four existing high voltage powerlines and significantly more distribution and reticulation lines totalling hundreds of kilometres within the 30km radius around the proposed 132kV power line PAOI. The 132kV power line will increase the total number of existing and planned high voltage lines by a small percentage, therefore the contribution of the proposed 132kV power line to the cumulative impact of all the high voltage lines is deemed to be of LOW significance. The combined cumulative impact of the existing power lines, i.e., the 132kV power line and all future proposed power lines on avifauna within a 30km radius is of MEDIUM significance.

9.2.4.3 Aquatic

The construction of the proposed infrastructure will result in a cumulative loss of habitat in the nearby other natural areas, ESAs, watercourses, and adjacent habitat. There is also a chance that more toxins and silt will reach the waterways. The ecological processes of the linked watercourse in the PAOI will be negatively impacted by the loss or alteration of habitat, but no significant effects are anticipated in the area. This reduces the catchment's ability to buffer against impacts on water quality. The combined impact of the project with the current and proposed projects in the area will have a Medium Significance. Given that some degree of hydrological and habitat alteration is unavoidable, the overall impact cannot be effectively avoided. Avoiding sites near watercourses will be crucial for reducing impacts as will the development of the proposed infrastructure. Due to the nature of the construction and operations activities, there will inevitably be some alteration in terms of residual consequences, which cannot be totally minimized. Following the execution of mitigation, the residual impact would be moderate and of long-term duration for the length of the project.

9.2.4.4 Terrestrial Biodiversity

When adding the changes noted in the natural vegetation, including the increased degradation on the mountains, it is evident that the scarce species are under severe threat in the area. The sensitivity of the vegetation and habitat (CBA 1 zoning) on the mountain has been modified. According to the

specialist, the CBA1 classification can be modified to CBA 2 or even ESA1. The 132kV power line and substation will result in the disturbance of approximately 0.02% and 0.10% of the District's CBAs and ESAs respectively. The contribution of the powerlines and substation to the cumulative impact is deemed to be low. The combined impact of the powerlines, substation, existing and future projects and activities such as wood harvesting, grazing is deemed to have a high cumulative impact. This is due to the ecological importance of CBAs and ESAs.

9.2.5 Impact Summary

The table below shows the summary of the impacts assessed and the impacts that were deemed to be of low significance such as noise and air with mitigation measures.

Table 9-34: Impact Summary and Significance Ratings

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
PRE-CONSTRUCTION					
Avifauna Flora Heritage	Site Walkdown	Destruction of sensitive resources	Medium (-)	Low (-)	▪ The heritage, avifauna, and ecology specialists should complete a "walk down" assessment of the final selected power line points, and all other activity areas (access roads, construction camps, etc.) before starting any construction activities. This walk down assessment will document all sites, features and objects, to propose adjustments to the tower positions and thereby avoid as many impacts as possible on sensitive areas/features.
Water	Design	Encroachment of infrastructure into the freshwater ecosystem.	Medium (-)	Low (-)	▪ Where possible, no infrastructure (such as pylon structures and new access roads) should be established within the recommended buffer areas for the freshwater ecosystems mapped along the proposed routes.
Environment	Awareness Training	Non-compliance with authorizations, permits and licenses	Medium (-)	Low (-)	▪ All personnel and contractors should undergo Environmental Awareness Training. ▪ The induction is to include aspects such as the EMPr conditions, project permits conditions, need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping". ▪ The training should focus on the compliance of the conditions

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					of the Environmental Authorization (EA), Environmental Management Programme (EMPr), and any other relevant permits and licenses. ▪ A signed register of attendance must be kept for proof.
CONSTRUCTION					
Flora	Vegetation Clearance	Fragmentation of CBAs and ESAs	Low (-)	Medium (-)	▪ Where possible, the powerline and substation should be limited to existing developed / degraded footprints. ▪ Areas of high ecological sensitivity should be demarcated as 'no-go' areas. ▪ Existing roads should be used where possible. ▪ Towers should be well placed to lower the need for clearing the whole corridor/ servitude.
	Servitude clearance Stringing Movement of plant	Destruction of protected and indigenous flora species	Medium (-)	Low (-)	▪ No construction or clearing can commence before receiving a valid permit for cutting and/or trimming protected trees. Where possible, the protected trees such as Adansonia digitata and Sclerocarya birrea, Philenoptera violacea, Breonadia salicina, and Combretum imberbe noted on-site must be avoided otherwise, a tree permit is required prior to pruning. ▪ A tree marking walk down must be carried out to quantify the type and quantity of protected trees within the line corridor. DAFF will also require that Eskom complete an offset for the trees cut. ▪ The ECO should be present in an advisory capacity during tree removal. ▪ Limited plants need to be removed when clearing the servitude for the new power line.

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					▪ Clear guidelines and proper plans must be given to the contractor and inspections should be cleared out daily during the clearing activities.
	Clearance of vegetation and movement of construction vehicles	Introduction and Proliferation of Alien Vegetation	Medium (-)	Low (-)	▪ Need to ensure all alien plants on construction sites are removed. ▪ Must clear alien vegetation on a regular basis. ▪ Disturbed areas around the construction sites should be re-vegetated with indigenous grasses. ▪ Proper strategy to prevent invasive alien plants from establishing and this will further prevent pollution and erosion
Avifauna	Site clearance at Mutshikili substation. Site Clearance at tower locations	Displacement of SCC and non-SCC priority species due to habitat loss and transformation	Low (-)	Low (-)	▪ Avoid removal of sensitive vegetation types. Construction activity should be restricted to the immediate footprint of the infrastructure. ▪ All construction activities should be strictly managed according to generally accepted environmental best practice standards, to avoid any unnecessary impact on the receiving environment. ▪ All temporary disturbed areas should be rehabilitated according to the site's rehabilitation plan, following construction. ▪ Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
	Excavation and construction activities	Displacement of SCC and non-SCC priority species due to disturbance	Medium (-)	Low (-)	▪ An avifaunal walk through of the final substation footprint and power line alignment should be conducted prior to construction, to identify any species that may be breeding on the site or within the immediate surrounds and to ensure that any impacts likely to affect breeding species (if any) are adequately managed.

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					▪ Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species. ▪ Measures to control noise should be applied according to current best practice in the industry.
Land Capability	Soil stripping and construction of infrastructure	Loss of agricultural land and soil potential	Low (-)	Low (-)	▪ Keep the surface disturbance footprint as small as possible. ▪ Soil nutrient cycles can somehow be maintained by revegetation of topsoil stockpiles and through proper ecological land rehabilitation. ▪ Rehabilitation of land can restore the grazing capacity to a large extend.
Soil	Vegetation Clearance and excavations	Soil erosion	Medium (-)	Low (-)	No surface storm water generated because of the development may be directed into any natural drainage system or wetland. A surface runoff and storm water management plan, indicating the management of all surface runoff generated because of the development (during both the construction and operational phases) prior to entering any natural drainage system or wetland, must be submitted (e.g., storm water and flood retention ponds). To minimize artificially generated surface storm water runoff, total sealing of paved areas such as parking lots, access roads, pavements and walkways should not be permitted. ***Permeable material should rather be utilized for these purposes***. In addition, runoff rainwater from all roofs must be managed to prevent erosion. No activity such as temporary housing, temporary ablution, disturbance of natural habitat, storing of equipment or any other use of the buffer/flood zone whatsoever, may be permitted during the construction phase.

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					▪An on-site ecological management plan must be implemented for drainage lines including management recommendations as well as potential rehabilitation of disturbed areas.
Water	Site Clearance Earthworks Operating plant	Loss of Wetland features habitat and ecological structure.	Medium (-)	Low (-)	▪ Ensure that vegetation clearing, and indiscriminate vehicle driving does not occur outside of the demarcated areas. ▪ Minimize construction footprints prior to commencement of the construction and control the edge effects from construction activities. ▪ Implement alien vegetation control program within the wetland features. ▪ Ensure that all activities impacting on the wetland features are managed according to the relevant DWS Licensing regulations (where applicable). ▪ As far as possible, all construction activities should occur in the low flow season, during the drier winter months. ▪ Any areas where active erosion within the wetland features is observed must be immediately rehabilitated in such a way as to ensure that the hydrology of the area is reinstated to conditions which are as natural as possible. ▪ Cutting/ clearing of the herbaceous layer within the wetland areas along the linear development should be avoided to retain soil stability provided by the grass root structures.
	Site Clearance Earthworks Operating plant	Changes to Ecological and Socio-Cultural Services Provision	Low (-)	Low (-)	▪ During construction use techniques which support the hydrology and sediment control functions of the freshwater features, and normal as soon as possible after construction. ▪ Limit excavations to a limited extent to ensure that drainage patterns within the features returns to pre- development status. ▪ Restrict construction to the drier winter months, if possible, to

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					avoid sedimentation of the freshwater feature and to minimize the severity of disturbance of the features and hydraulic function. ▪ Monitor the wetland feature for erosion and incision. ▪ Maintain the REC for each of the wetland features; and ▪ Implement an alien vegetation control program within the wetland features and ensure establishment of indigenous species within areas previously dominated by alien vegetation.
	Site Clearance, Soil stripping, Earthworks	Loss of hydrological function and sediment balance	High (-)	Low (-)	▪ Any construction-related waste must not be placed in the vicinity of the wetland features. ▪ Limit the footprint area of the construction activity to what is essential to minimize environmental damage. ▪ Stockpiled soil must be removed, and the area must be levelled to avoid sedimentation of the wetland features from runoff. ▪ As far as possible, all construction activities should occur in the low-flow season, during the drier summer months. ▪ Vehicles should not be driven indiscriminately within the wetland features during maintenance activities to prevent soil compaction.
	Construction activities Vehicle maintenance and refueling	Pollution of freshwater ecosystems and disturbance of aquatic fauna	Medium (-)	Low (-)	▪ All wetlands and drainage lines should generally be treated as “no-go” areas and appropriately demarcated as such. No vehicles, machinery, personnel, construction materials, cement, fuel, oil, or waste should be allowed into these areas without the express permission of and supervision by the ECO. ▪ Construction camps, toilets and temporary laydown areas should be located at least 30 m from the edge of any

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					wetlands and drainage lines. ▪ No fuel storage, refueling, vehicle maintenance or vehicle depots should be allowed within 30 m of the edge of any wetlands or drainage lines. ▪ Refueling and fuel storage areas, and areas used for the servicing or parking of vehicles and machinery, should be located on impervious bases, and should have bunds around them. Bunds should be sufficiently high to ensure that all the fuel kept in the area will be captured in the event of a major spillage. ▪ Vehicles and machinery should not be washed within 30 m of the edge of any wetland or drainage line. ▪ No effluents or polluted water should be allowed to discharge into any drainage lines or wetland areas.
Air Water Soil	Handling and disposal of waste and sewage	Odour, soil, surface, and ground water pollution	Medium (-)	Low (-)	▪ A waste management hierarchy must be implemented. ▪ Method Statement for management of waste and sewage must be submitted to the ECO before construction. ▪ Safe Disposal Certificates must be provided. ▪ Waste and sewage must be disposed of at a licensed landfill.
Heritage	Earthworks	Damage to archaeological objects	Low (-)	Low (-)	▪ Familiarise all staff and contractors with procedures for dealing with heritage objects/sites. ▪ A heritage practitioner should complete a “walk down” of the final selected power line servitudes, the chosen deviation location, and all other activity areas (access roads, construction camps, etc.) before starting any construction activities. This walk down will document all sites, features and objects, to propose adjustments to the routes and thereby to

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					avoid as many impacts to heritage as possible.
Paleontology		Damage to fossil heritage objects	Low (-)	Low (-)	▪ If fossils are found by the environmental officer, or other responsible person once excavations for pole foundations have commenced, then they should be rescued, and a paleontologist called to assess and collect a representative sample. ▪ The foundations should be monitored for any fossils once excavations have commenced. ▪ A Chance Find Protocol must be implemented where required.
Visual	Construction Camp establishment	Landscape character	Medium (-)	Low (-)	▪ Keep disturbed areas to a minimum. ▪ No clearing of land to take place outside the demarcated footprints. ▪ The contractor should maintain good housekeeping on-site to avoid litter and minimize waste.
Social	Construction activities	Waged Labour	Low (+)	Medium (+)	▪ Representatives from the various local municipalities could assist in determining local subcontractors and laborers that should be considered for possible employment. ▪ The tender document should specify the use of local laborer's or enterprises (where possible). It should be stipulated in the tender documentation that contractors use local laborers for manual and low skilled activities such as fencing and bush clearing. Where possible, on-site training should be undertaken to ensure long term benefits to the members of the community.
	Training of employees/	Capacity Building and skill development	Low (+)	Medium (+)	▪ Eskom's own internal policies and procedures should be used to ensure a fair and transparent recruitment process.

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
	workers				▪ Salaries of women should be equal to that of men when undertaking the same work. ▪ Training and skills development should take place for women. ▪ Institute a well-designed gender equality strategy, if not available.
	Hiring of workers	Gendered division of labor	Low (+)	Medium (+)	▪ Stakeholders should be mutually accountable for increased opportunities regarding skills and competency development (general education and technical training). This training should be concentrated on skills that can be readily transferred to other employment opportunities in the local area, and only suitable qualified candidates in project management activities should be used.
	Acquiring Right of Way	Displacement and relocation of households	Medium (-)	Medium (-)	▪ Negotiations should be approached with the necessary cultural sensitivity. ▪ Sufficient compensation and assistance with the relocation process. ▪ A Land Acquisition Process and Compensation Assessment and Action Plan must be developed.
	Influx of workers	Community unrest	Low (-)	Low (-)	▪ Employment should be made through local community structures.
	Movement of plant Construction activities	Noise	Low (-)	Low (-)	▪ Use noise barriers and equipment with low noise. ▪ Noise control plan should be prepared. ▪ Site vehicles and equipment should be regularly serviced and maintained in a good working order. ▪ Where necessary staff should be provided with ear plugs.
	Movement of construction vehicles	Traffic Congestion	Low (-)	Low (-)	▪ The current existing roads should be used to access the powerline. ▪ The necessary traffic control signage should be installed on

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
					site. ▪ Delivery of material be outside of peak hours to prevent traffic congestion. ▪ Should temporary roads be required, these should agree with the landowners. ▪ Powerline servitude road should be developed and used as per the agreement with the landowners. ▪ Reduce speed to prevent animal road kills.
OPERATIONS					
Avifauna	Operation of a 132kV powerline	Mortality because of collisions with the 132kV powerline.	Medium (-)	Low (-)	▪ The 132kV power line must be constructed using a bird friendly structure. ▪ Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.
	Operation of a 132kV powerline	Mortality of SCC and non-SCC priority species because of electrocution on the 132kV power line infrastructure	Medium (-)	Low (-)	▪ High risk sections of the power line must be identified by a qualified avifaunal specialist during the walk-through phase of the project once the alignment has been finalized. If power line marking is required (i.e., in areas that contain drainage lines, open grassland-type habitat and water bodies) bird flight diverters must be installed on the full span length on each of the conductors (according to Eskom guidelines - five metres apart). Light and dark color devices must be alternated to provide contrast against both dark and light backgrounds respectively. These devices must be installed as soon as possible after the conductors and earth wires are strung.
	Operation of Mutshikili	Mortality because of electrocutions within the	Low (-)	Low (-)	▪ Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and

AFFECTED ENVIRONMENT	ACTIVITY	IMPACT DESCRIPTION	SIGNIFICANCE BEFORE MITIGATION	SIGNIFICANCE POST-MITIGATION	PROPOSED MITIGATION MEASURES
	Substation	Mutshikili Substation and on the 132kV power line infrastructure			line patrols of the Mutshikili Substation and 132kV power line to the Eskom-Endangered Wildlife Trust Strategic Partnership. ▪ Insulating material (if applied) to be maintained during the operational life span of the Mutshikili Substation and 132kV power line
Rivers and Wetlands	Maintenance	Altered hydrology. Erosion	Medium (-)	Low (-)	▪ Increased erosion and alteration of the hydrology of drainage lines and wetlands, because of establishing distribution line towers within or immediately adjacent to these freshwater ecosystems. ▪ Increased erosion and alteration of the hydrology of drainage lines and wetlands because of establishing access roads through these freshwater ecosystems. ▪ Clearing or trimming of natural vegetation in and around wetlands and drainage lines located within the servitude of the power line, as part of the routine maintenance operations. ▪ Noise- and lighting-related disturbance to aquatic and semi-aquatic fauna associated with freshwater ecosystems located near the proposed substation/s.
Social	Operation of powerline and substation	Visual impact	High (-)	Medium (-)	▪ Concentrate powerline in or near existing corridors to prevent proliferation of the natural landscape. ▪ Keep disturbed areas to a minimum. ▪ No clearing of land to take place outside the demarcated footprints; and ▪ The contractor should maintain good housekeeping on site to avoid litter and minimise waste.
	Operation of powerline and substation	Access to electricity	High (+)	High (+)	▪ Eskom must regularly maintain infrastructure.

9.3 Positive and Negative Impacts associated with Proposed Activity

The table below summarizes the positive and negative impacts the proposed project will have on the environment.

Table 9-35: Positive and Negative impacts of the proposed project

Aspect	Rating (Negative / Positive)	Impact Description
Positive and Negative Impacts that will be experienced if the powerline is constructed.		
Job creation	Positive	The proposed project will create job opportunities during its various phases including planning and design, pre-construction, construction, operational and decommissioning phases.
Terrestrial Biodiversity and Flora	Negative	The area south of the Mutale River is ESA2 with the southern aspect of the mountain north of the river listed as CBA1. The northern aspect of the mountain is listed as CBA2 and the area around the proposed substation is ESA1. The area between the mountain and the substation is listed as ESA2. However, this environment has changed with modified natural vegetation due to anthropogenic activities. None of the four red data species listed (SANBI Precis, 2018) will occur on site, as there is no suitable habitat present. Protected trees have been noted and recommendations have been included.
Ecology (Fauna)	Negative	Very little animal activity (apart from domestic) was noted. The high impact on the general habitat and loss of natural vegetation contributes to the low incidence of biota. Most of the mammals and reptiles will move away from the corridor during construction and will recolonize the area during the operational phase.
Heritage	Neutral	The only signs of sites of heritage potential were graves and historical structures found mostly on corridor one. Although no remains of Stone/ Iron Age sites were noted during site visit, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools. The significance of these sites, structures and graves have been rated Low-High. None of the findings can be of such significance

Aspect	Rating (Negative / Positive)	Impact Description
		that can prevent the proposed development from proceeding.
Paleontology	Negative	The proposed substations and powerline routes lie mostly on the moderately sensitive Quaternary sands and alluvium with the northernmost and southernmost section on the Wyllie's Poort Formation (Soutpansberg Group). No fossils have been reported from this area. If fossils are found, the mitigation measures included in the EMPr should be implemented.
Aquatic	Negative	The proposed power line will cross many hydrological / freshwater resources whilst the substation is close to wetlands. Looking at the current PES of the assessed systems as well as the potential risks which may result from the powerline routes, the negative impacts identified can be mitigated successfully.
Avifauna	Negative	A large proportion of the PAOI is subject to significant levels of disturbance, this is particularly true for the proposed development footprint. Although Lappet-faced Vulture was previously observed within the broader PAOI, during the 15-year SABAP2 survey period, only two individuals were recorded. While the species may traverse across the proposed development footprint and occasionally forage in the area, it is highly unlikely that area earmarked for the proposed Mutshikili Substation and 132kV power line alignment will support the breeding requirements of the species, owing to the significant levels of anthropogenic disturbance at the substation locations. SCC has been recorded in very low numbers with between one and ten individual birds of each species being recorded over the fourteen-year survey period. This is an accurate reflection of the diversity and abundance of SCC that are likely to be found within the area surrounding the proposed Mutshikili Substation and 132kV power line given the habitat present and the existing disturbance in the PAOI. No SCC was observed during the field survey. The

Aspect	Rating (Negative / Positive)	Impact Description
		impacts identified will be mitigated to acceptable levels with the implementation of the EMPr.
Visual impact	Negative	Visual character is based on human perception and the observer's response to the relationships between and composition of the visible project components. The towers and the substation are the most visible and permanent project component. There are easily absorbed in the background when viewed from distances greater than 1km however the visual intrusion will be high on residents of the villages where the line traverses and the substation is located.
Soil and land capability	Negative	Erosion as well as hydrocarbon spills and leaks of vehicles and heavy machinery is expected to impact upon the groundwater source given the permeability of the underlying bedrock. These impacts can however be mitigated to a certain extent. The laydown area, camp site and tower positions will impact on the soil and other small crop farming area, this impact can be mitigated to acceptable levels with the implementation of the EMPr.
Traffic	Negative	Delivery of materials on site and workers travelling to work will lead to high traffic volumes. This impact has been assessed and can be mitigated to acceptable levels.
Waste	Negative	The proposed project will generate different waste streams. If the waste is not properly managed it can cause pollution on site. This impact has been assessed and mitigation measures are provided.
Noise	Negative	Noise will be generated from the movement of construction vehicles and equipment. This may impact on the humans and animals. This impact has been assessed and can be mitigated to acceptable levels.
Social	Positive	The following are impacts are expected during construction: Benefits accruing to the local economy due to short-term socio-economic spin-offs, skills training of local laborers, the supply of electricity are anticipated during

Aspect	Rating (Negative / Positive)	Impact Description
		the project life cycle. These impacts have been assessed and mitigation measures to enhance the impact.
	Negative	Influx of laborers, encroaching on private property, spreading transmitted diseases, causing conflicts, visual intrusion on residents, motorists and tourists are some of the negative impacts that can be expected during the implementation phase. Apart from the intrusion, which is permanent, mitigation measures to minimize the negative impacts have been recommended.
Positive and Negative Impacts that will be experienced if the no-go alternative is implemented		
No job creation	Negative	If the power line is not built, there will be no employment opportunities created.
No provision of power	Negative	i. Lack of electricity will have a negative impact on economic development thereby resulting in no generation of disposable income and other benefits which ultimately lead to poverty reduction. ii. Reliance on wood and biomass for cooking and heating will continue resulting in the degradation of the CBA and destruction of indigenous vegetation. This will also have a negative impact on both indoor and outdoor air pollution.
Undisturbed environment	Positive	If the power line is not built, there will be no disturbance to the environment including CBAs, ESAs, fauna, flora, soil, heritage, paleontology, aquatic, topography and more.

10 OVERVIEW OF SPECIALISTS' ASSESSMENT

10.1 Screening Report

The identification and commissioning of the specialist studies was based on the preliminary site inspection undertaken by DIGES and the Proponent (Eskom), to verify the environmental theme sensitivities as indicated in the Screening Reports generated for the powerlines and the substation. The site sensitivity verification was undertaken as per the Gazetted General Requirement Assessment Protocols. The table below indicates the environmental theme sensitivities and the recommended Specialist assessments as per the Screening Report generated from the DFFE tool. Reference is also made to the Screening Reports attached in Appendix B-1 and B-2.

Table 10-1: Environmental Sensitivities

THEME	SENSITIVITIES	ARE SPECIALIST STUDIES DONE	
		POWERLINES	SUBSTATION
Agriculture	High	Yes	Yes
Animal Species	Medium (substation) High (Powerline)	Yes	Yes
Aquatic Biodiversity	Very High	Yes	Yes
Archaeology & Heritage	Low	Yes	Yes
Civil Aviation	High	Yes	Yes
Defence	Low	No	No
Paleontology	Medium	Yes	Yes
Plant Species	Medium	Yes	Yes
Terrestrial Biodiversity	Very High	Yes	Yes

Based on the environment observed and the nature of the development, several specialist studies were commissioned to gain an in-depth understanding of the status quo of various aspects of the environment and how the development will have an impact on these environmental aspects. The basis of not commissioning the RFI and Civil Aviation Assessments is given below:

10.1.1 RFI Assessment

The Astronomy Geographic Advantage (AGA) Act of 2007 and its regulations protect areas suitable for astronomy studies by, among others, regulating radio and electrical interference. Furthermore, it has implications for people living within an Astronomy Advantage Area (AAA). AAA that has been declared are in the Northern Cape Province. The project area is more than 800km from the NC, so its impact on RFI is insignificant; hence a full assessment is not required. However, the South African Radio Astronomy Observatory (SARAO) have been included as a stakeholder, and DIGES will avail all project documentation to them.

10.1.2 Commissioned Studies

In addition, to the specialist studies indicated in the Table above, visual/ landscape assessment, wetland delineation, Flood line determination as well as Geotechnical investigation at substation sites were also commissioned. The Specialist studies that have been undertaken have been based on the Gazetted Protocols published in Government Notice No. 320 of 20 March 2020. Where no protocol exists for a specific theme, the assessment and reporting of impacts on that feature or proposed area of development was done in accordance with Appendix 6 of the NEMA EIA Regulations Government Notice R326 of 2017. The studies undertaken have generally followed the same approach:

- Collection and collation of existing baseline information of the study area in addition to any supplementary survey work required to fill any data gaps.
- Regular consultation with specialists within the team.
- Consideration of the potential impacts of the proposed powerline on the existing baseline, followed by identification of possible route changes that would lead to the avoidance or reduction of predicted adverse effects.
- An evaluation of the significance of any residual and cumulative impacts.
- Recommendation of mitigation measures to minimize the anticipated impacts.

Summaries of the agricultural, aquatic, avifauna, archaeology, civil aviation, hydrology, paleontology, terrestrial biodiversity, visual and wetland assessments are given in the sections below whilst the detailed reports are attached in Appendices E-1 to E-11.

10.2 Agricultural/ Land Capability Assessment

The Agricultural Impact study was carried out by LionHortic Consulting and the summaries indicated below are excerpts from the Agricultural Impact Report that is attached in Appendix E-1. The assessment was undertaken based on the minimum report requirements listed in the Protocol for the

Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Agricultural Resources, (Government Gazette No 43110, 20 March 2020).

10.2.1 Summary of Assessment

Corridor 1

Traverses essentially smallholder farms for about 3.64 km and vacant unspecified lands for about 2.08 km. Beyond this, it continues for approximately 2.0 km across cultivated lands. The route will affect cultivated and subsistence farming, settlement, and naturally vegetated areas.

Corridor 2

Corridor 2 traverses the peripheries of farms unspecified lands for about 5.26 km and 2 km across hill and Vacant land. It continues for 4 km through subsistence farms and settlement areas. Relative to corridor 1, the impact on the settlement and subsistence farms is higher. The route will affect cultivated and subsistence farming, settlement, naturally vegetated, and conservation areas.

Both corridors, alternatives one and two, pass through crop fields, and rangeland land vegetation with less natural grass and orchards. However, route alternative 2 passes through fields where more crops are grown, which may potentially cause significant disruption in farming operations. As it is indicated in farm named (f3, f4, f5, and f13).

Most farms within the designated areas are not equipped with structures or infrastructures, but they are mostly fenced. However, the data clearly show that farms at Corridor 1 are much more built up and equipped with modern infrastructure than the site of Corridor 2. This is expected to consider as the farming systems of crop farming and fruit Farming in Corridor 1 and Corridor 2. Both corridors have farms which comprise farm dwellings and sheds, with livestock handling facilities on one farm and one irrigation system. Corridor 2 boasts three farmhouses and other well-maintained infrastructure such as irrigation pumps and systems, sheds, animal handling facilities, a fully equipped piggery with heating systems and a feedlot.

The difference between corridors 1 and 2 regarding yields is very similar under dryland conditions. Farmers at both corridors have indicated their average yields for the past three years as between 3.5 and 5 tons per ha.

10.2.2 Conclusions and Recommendations

The construction of substations and powerlines can have cumulative impacts on small-scale agriculture, including land fragmentation, soil compaction, including soil degradation, disruption of pollinators, disruption of irrigation systems, potential economic losses, and potential health risks for farmers. To mitigate these impacts, it is crucial to implement measures such as

- Proper land management practices, soil conservation techniques,
- Coordination between infrastructure developers and farmers to minimize disruptions to irrigation systems.
- Providing financial support and technical assistance to small-scale farmers can help them adapt to the challenges posed by substation and powerline construction.
- Additionally, raising awareness among farmers about potential health risks and providing guidelines for safe practices can help protect their well-being.
- By considering these factors, we can ensure the sustainability and resilience of small-scale agricultural practices in the face of infrastructure development.

10.3 Aquatic Ecological Impact Assessment

The Aquatic Ecological Impact Study was carried out by Naledzani Environmental Services. The report is attached in **Appendix E-3.**

10.3.1 Assumptions and Limitations

The following assumptions were made:

- Analysis of the freshwater ecosystems was undertaken according to nationally developed methodologies as defined by DWS (Department of Water and Sanitation).
- That pylon structures of some sort would need to be erected every few hundred metres along the power line route that is selected, to support the distribution cables.
- That a continuous access road would be established along the centreline of the proposed route between towers unless alternative existing access roads are identified or there are areas where it is not possible to establish such an access road.
- The application of the recommended buffer areas to these freshwater ecosystems does compensate for inaccuracies in the delineation of these features.
- That there will be further opportunity for freshwater ecological input into the selection of specific positions for pylon structures before they are erected and the final routing of access roads to and between pylons.
- Recommendations are based on professional opinion and best practise guidelines within South Africa.
- Should the client undertake the proposed development activities within the identified surface water resources banks and beds, then a Section 21 c and i Water Use Application and Authorisation will be needed from the Department of Water and Sanitation (DWS).

10.3.2 Summary of Assessment

When assessing the powerline routes the was no difference in terms of order of preferences. Both powerline routes (Alt 1 and 2) cuts through the Mutale River which is regarded as an NFEPA. Although there were differences in the chemical properties of the water samples (point B and C), this might be due to differences in the time for sampling. Both line routes, are still to impact the wetland up on point A. As such, in terms of aquatic assessment, any powerline route can be the preferred. As the impacts will be the same on the aquatic resources. Two major freshwater ecosystems were identified along the proposed route for the 132kV Tshilamba powerline routes (i.e., Alt 1 and Alt 2). The points were assessed to be in good condition and were rated to be of **moderate** conservation importance. The potential for the encroachment of infrastructure associated with the proposed powerline routes (especially pylons and access roads) into freshwater ecosystems is minimal as the powerline (be alternative 1 or alternative 2) only crosses two points but point A has a widespread wetland in which the line may need to be adjusted.

The preferred substation is alternative 3 as it situated at least 170 meters way from water a stream and the powerline to be connect to it does not transverse any stream. The significance of most of the potentially negative construction-, operational- and decommissioning-phase impacts is dependent on the degree to which the encroachment into freshwater ecosystems can be avoided during the design phase to affect the construction phase. If the encroachment of power line pylons and access roads into freshwater ecosystems can be avoided, then it is predicted that most of the potential negative impacts to freshwater ecosystems would be reduced to low levels of significance, if all the other mitigation measures recommended in the current report are also properly implemented.

10.3.3 Conclusions and Recommendations

The following recommendations should be included in the EMPr and implemented by a qualified ECO:

All wetlands and drainage lines should generally be treated as “no-go” areas and appropriately demarcated as such. No vehicles, machinery, personnel, construction materials, cement, fuel, oil, or waste should be allowed into these areas without the express permission of and supervision by the ECO.

- Construction activities associated with the establishment access roads through wetlands or drainage lines (if unavoidable) should be restricted to a working area 10 m in width either side of the road, and these working areas should be clearly demarcated. No vehicles, machinery, personnel, construction material, cement, fuel, oil, or waste should be allowed outside of the demarcated working areas.

- There should be as little disturbance to surrounding vegetation as possible when construction activities are undertaken, as intact vegetation adjacent to construction areas will assist in the control of sediment dispersal from exposed areas.
- Construction camps, toilets and temporary laydown areas should be located at least 30 m from the edge of any wetlands and drainage lines.
- Vehicles and machinery should not be washed within 30 m of the edge of any wetland or drainage line.
- No effluents or polluted water should be allowed to discharge into any drainage lines or wetland areas.
- If construction areas are to be pumped of water (e.g., after rains), this water should be pumped into an appropriate settlement area, and not allowed to flow straight into any drainage lines or wetland areas.
- No spoil material, including stripped topsoil, should be temporarily stockpiled within 30 m of the edge of any wetland or drainage line.
- Freshwater ecosystems located near construction areas (i.e., within ~30 m) should be inspected on a regular basis by the ECO for signs of disturbance from construction activities, and for signs of sedimentation or pollution. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.
- Workers should be made aware of the importance of not destroying or damaging the vegetation along drainage lines and in wetland areas, of not undertaking activities that could result in the pollution of drainage lines or wetlands, and of not killing or harming any animals that they encounter. This awareness should be promoted throughout the construction phase (and decommissioning phase if this takes place).

10.4 Archaeology And Cultural Heritage

The Heritage Impact study was carried out by Vhubvo Archaeo-Heritage Consultants and the full report is attached as **APPENDIX E-2.**

10.4.1 Assumptions and Limitations

- Most of the area proposed for development is encroached by bush which makes it almost impossible to access. It is thus possible that some materials could have been overlooked due to that the area was investigated only in a broad, overview approach as access to the different properties was not possible.

- It is assumed that the Public Participation Process might also result in the identification of sites, features and objects, including sites of intangible heritage potential in the corridors and that these will also have to be considered in the selection of the preferred corridor.

10.4.2 Impact Assessment

'Excerpt from the Heritage Impact Assessment'

- Archaeological sites dating to the Stone, Iron and Historical Age are known to occur in the wider region of the study area. From the survey conducted, there was no archaeological site noted in any of the proposed corridors (s). Although no remains of Stone/ Iron Age sites were noted during the site visits, the area could still contain camps and some areas with suitable substrates that could have been used as quarries for material to produce tools, particularly next to the river. It should be noted that in the Iron Age people preferred to settle on the alluvial soils close to rivers. As such, all riverbanks are considered sensitive and should be avoided in the best way possible.
- The impact on graves is of concern as several graves have been noted in the proposed study area, especially in corridor one.
- As the powerline is still in early stage, e.g., the exact position of the powerline/ access roads is yet to be finalized, it might be possible that specific aspects related to development might have a direct disturbance, which would result in irreplaceable loss of heritage resources. Nonetheless, there is also a high chance of finding archaeological sites often hidden underground, and this will be difficult to avoid since most of these are trifling. This will be difficult to avoid since most are trifling, often hidden underground, and only exposed once construction begins.

10.4.3 Conclusion and Recommendations

- **Substation Alternative 1** is the most preferred alternative from a heritage impact perspective since the land appears to have been used in the past for issues related to farming, and areas of this nature are not ideal for archaeological materials as any materials that could have existed there, would have been destroyed by past farming activities. This is followed by Site Alternative 2, 3 and then 4.
- **Route Alternative 2** is also the most recommended since it mostly transverses over farmland and few graves. Accordingly, and from a holistic perspective, any alternative will not have a significant negative impact from a heritage impact perspective.
- It is recommended that the proposed development proceed as no major heritage flaws which can hamper the success of this project were noted. It should be noted that, as the exact

coordinates for the power line and the individual tower structures are not yet available, it is difficult to determine what the final impact of the proposed development would be like. Henceforth, for the project to continue, it is therefore recommended that:

- ✓ A heritage practitioner should complete a "walk down" of the final selected power line servitudes, and all other activity areas (access roads, construction camps, etc.) prior to the start of any construction activities. This walk down will document all sites, features and objects, to propose adjustments to the routes and thereby to avoid as many impacts to heritage as possible.
- ✓ All grave sites should be avoided in the best way possible. Meaning attempts should be made to avoid all grave sites during final stage of planning.

10.5 Avi-Fauna Impact Assessment

The Avi-fauna Impact study was carried out by Feathers Environmental Services and the summaries indicated below are excerpts from the Avifauna Report that is attached to Appendix E-4. The assessment was undertaken based on the minimum report requirements listed in the Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species (Government Gazette No 43855, 30 October 2020).

10.5.1 Assumptions and Limitations

The following assumptions and limitations were made:

- The report is the result of a short-term study and is based on a one-day field survey of the PAOI. No long-term, seasonal monitoring was conducted by the avifaunal specialist. The assessment relies upon secondary data sources with regards to bird occurrence and abundance such as the SABAP2 and IBA projects. These comprehensive datasets provide a valuable baseline against which any changes in species presence, abundance, and distribution can be monitored. However, primary information on bird habitat and avifaunal species occurrence collected during the site visit and together with professional judgement, based on extensive field experience since 2006, was used directly in determining which species of conservation importance are likely to occur within suitable avifaunal habitat types within the PAOI. Based on these findings, the specialist was able to identify and assess the anticipated impacts and provide recommendations for mitigation.
- The site survey of the Mutshikili Substation alternatives and the 132kV power line alignment and the resultant observations were made in a single season (austral spring), during which time various species may not have been present in the PAOI and therefore may not be a true indication of all bird species potentially present in the area.

- The focus of the assessment is primarily on the potential impacts on regional SCC and non-SCC power line sensitive species i.e., species that are vulnerable to the displacement, collision and electrocution impacts associated with the construction and operation of the Mutshikili Substation alternatives and the 132kV power line.
- Predictions in the study are based on experience of these and similar species in different parts of South Africa, through the authors' experience working in the avifaunal specialist field since 2006. However, bird behaviour can't be reduced to formulas that will hold true under all circumstances. It must also be noted that it is often not possible to eliminate the risk of the disturbance and displacement impacts associated with the construction and operational activities.

10.5.2 Description of Expected Impacts

'Excerpt from the Avi-fauna Report' compiled by Feathers Environmental Services

Because of their size and prominence, electrical infrastructure constitutes an important interface between wildlife and man. Negative interactions between wildlife and electricity structures take many forms, but two common problems in southern Africa are the electrocution of birds (and other animals) and birds colliding with power lines. Other problems include electrical faults caused by bird excreta when roosting or breeding on electricity infrastructure and displacement through disturbance and habitat destruction during construction and maintenance activities.

Construction Phase

a. Displacement due to habitat transformation

Given that a large proportion of the proposed power line will traverse habitat that is already transformed by subsistence agricultural practices, the construction of the new power line should have a **LOW** habitat transformation impact from an avifaunal perspective. If the removal of large trees can be avoided, particularly within the mountain and riparian areas, the impact of habitat transformation risk is judged to be **LOW**.

The habitat at the proposed Mutshikili substation does not contain unique features that will make it critically important for avifauna. The species that are most likely to be affected by the loss of habitat are the smaller, non-threatened passerines that are currently potentially resident in the area earmarked for the development of the substation. It is not envisaged that any Red List species will be displaced by the habitat transformation that will take place because of the construction of the proposed Mutshikili substation, therefore this impact is likely to be **LOW.**

b. Displacement because of disturbance

As the development area is already subjected to a significant degree of disturbance in the form of settlements, pastoral activities, agricultural activities and vehicle and pedestrian traffic; construction activities within the PAOI are likely to result in temporary displacement as opposed to permanent displacement of species from the area. The resilience of power line-sensitive species in the PAOI despite the existing disturbance coupled with the fact that similar habitat is available throughout the broader area means that the displacement impact will not be of regional or national significance.

c. Direct mortality because of construction activities

Bird mortality because of construction activities is improbable because birds are incredibly mobile and able to move out of harm's way. If mortality does occur, it is likely to be confined to a localized area and restricted to immobile species e.g., nestlings. No terrestrial bird species (ground) nest locations were observed during the site survey.

Operational Phase

d. Electrocution

Vultures are unlikely to occur regularly within the study area, but sporadic occurrences cannot be ruled out. The only envisaged high-risk scenario would be when a carcass becomes available within a few hundred metres of the line, attracting vultures which may cluster on a few poles. This is likely to be an irregular event in the study area and therefore it can be concluded that electrocutions on the proposed 132kV power lines are highly unlikely through conventional mechanisms and the risk is therefore rated to be **MEDIUM**.

Electrocutions within the proposed Mutshikili substation yard are possible but should not affect the more sensitive Red List bird species as these species are unlikely to use the infrastructure within the substation yards for perching or roosting. The risk of electrocution within the substation yard is therefore evaluated to be **LOW**.

e. Collisions

Relevant to the proposed 132kV power line, potential candidates for collision mortality in the woodland habitat on the proposed power line are Kori Bustard, Lanner Falcon, Southern Ground-hornbill, Bateleur, African Crowned Eagle, Tawny Eagle, and Martial Eagle. The risk of collisions is likely to be few and far between, as there are no specific areas where one would expect a concentration of birds in woodland habitat.

The biggest potential collision risk in the study area is associated with ephemeral drainage lines, where it is expected that waterbirds could commute up and down when they are flowing or when they contain large pools of standing water. Red List species that could be impacted are Black Stork, Yellow-billed

Stork, and Saddle-billed Stork as well as many other non-threatened waterbirds. In summary, the risk of collision posed to avifauna by the proposed power line is likely to be of **MEDIUM** significance. With mitigation, this risk could be reduced to **LOW.**

Decommissioning & Closure Phases

f. Displacement because of disturbance

The PAOI is already subjected to a degree of disturbance associated with peri-urban, pastoral, and agricultural activities. While the decommissioning of the Mutshikili Substation and 132kV power line in this area will undoubtedly displace some species, the bird species likely to occupy this area, and the fact that similar habitat is available within the broader PAOI, displacement because of disturbance is unlikely to be permanent and of national significance.

10.5.3 Conclusions and Recommendations

The four substation alternatives occur within the same pentad, subjected to the same land use practices and therefore likely to be identical in terms of species diversity and density too. Similarly, the two proposed power line alternative corridors are located across the same three pentads and are also subject to the same land use practices and therefore likely to be identical in terms of species diversity and density. The selection of a preferred substation location and power line route alignment was determined using observations of available microhabitats in relation to proposed infrastructure and the length of the proposed power line alternatives.

Substation Alternatives 2 and 4 are located adjacent to an ephemeral drainage line and a dam - habitats that are likely to attract a variety of priority species. The displacement impact is likely to be more significant at these two locations, given the presence of these waterbodies (disturbance) and the woodland habitat prevalent at each location (habitat loss). Substation Alternative 1 is in an area that is already transformed and although Alternative 3 is located within woodland habitat, this site is adjacent to what appears to be an old school building with an access road. **Alternatives 1 or 3** are therefore nominated as the preferred substation alternative.

In terms of micro habitats, power line corridor Alternatives 1 and 2 are largely identical. Therefore, the length of power line has been considered. A shorter length of power line is likely to reduce the potential collision impact as well as the indirect displacement impact associated with habitat loss and disturbance. Corridor Alternative 1 is approximately 6.5km in length and Corridor Alternative 2 is approximately 7.5km in length. It is on this basis that Corridor Alternative 1 is nominated as the preferred power line alignment alternative. However, it is important to note that neither of the two power line alternatives are fatally flawed and the proposed 132kV power line can be constructed and operated in either of the two alternative corridors with appropriate mitigation.

The habitat within which the PAOI is located is considered to have a **moderate to low** sensitivity. In recent years, anthropogenic impacts, mostly in the form of peri-urban, pastoral, and agricultural activities have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the Mutshikili Substation and 132kV power line will result in impacts of **medium-low** significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. It is anticipated that the Mutshikili Substation and 132kV power line can be constructed with acceptable levels of impact on the resident avifauna, subject to the following recommendations:

An avifaunal walk-through of the final substation footprint and power line alignment should be conducted before construction, to identify any species that may be breeding on the site or within the immediate surrounds and to ensure that any impacts likely to affect breeding species (if any) are adequately managed and to identify the exact sections of power line requiring collision mitigation.

- The 132kV power line must be constructed using a bird-friendly structure.
- Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively, all jumpers must be suspended below the cross-arms.
- The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint (especially the removal of natural vegetation) and rehabilitation of disturbed areas is concerned.
- Construction activities (i.e., all staff, vehicles, and machinery) should be restricted to the immediate footprint of the infrastructure.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of avifaunal species.
- Maximum use should be made of existing roads and the construction of new roads must be kept to a minimum.
- If collision or electrocution impacts are recorded once the Mutshikili Substation and 132kV power line are operational, it is recommended that a representative from the Eskom-Endangered Wildlife Trust Strategic Partnership investigate the mortalities and provide recommendations for site-specific mitigation to be applied reactively.
- In addition to this, the normal suite of environmental good practices should be applied, such as ensuring strict control of staff, vehicles and machinery on site and limiting the creation of new roads as far as possible.

10.6 Biodiversity Impact Assessment

The Biodiversity Impact Study was carried out in 2018 and revised in October 2022 and June 2023 by Bioassets (Dr Wyland Vlok). The report is attached in **Appendix E-5.**

10.6.1 Assumptions and Limitations

- There were no constraints experienced for the desktop or field assessment. Access to all areas were possible, with the exclusion of some private properties where the owners were not present. A visual assessment of the larger trees was still possible.
- There were no constraints for the desktop or field assessment. The study was conducted in winter, limiting the botanical assessment, as some species may not be present at the time. Although the study was conducted in the dry season, it was clear that the previous wet season had good rains, as the basal layer was well developed in most places. No standing water (apart from the rivers) were noted during the survey.
- No wetland assessment or delineation was conducted as part of this assessment and associated reports.
- There were not confidentially constraints.
- Apart from the prevailing weather conditions at the site, there were no other significant constraints that would negatively impact upon the study.

10.6.2 Summary of Assessment

'Excerpt from the Biodiversity Report'

It is evident that the historic and current land use activities have modified the natural vegetation to varying degrees (town development, agriculture which includes cultivation and grazing, wood harvesting, grazing, and trampling). The area south of the Mutale River is severely modified by the agricultural activities and there are problems related to alien plant species and erosion.

The vegetation along both corridors is severely modified with exceptions on the mountains where the impacts are low, but increasing) wood harvesting, grazing, and trampling). On the mountain two scenarios are present. Vegetation on the southern slope (north of the Mutale River) is in a good (moderately modified recently) condition. On the ridge and at the top of the northern slope the vegetation is in a fair condition, but as one moves towards the lower slopes at the foot of the mountain, the natural vegetation integrity deteriorates. This is linked to encroaching cultivation, grazing, trampling and wood harvesting. Some large Sclerocarya birrea, Combretum imberbe, Afzelia quanzensis and Adansonia digitata were noted. In the area a number of alien invasives were noted during the rapid survey. These included Conyza spp., Argemone ochroleuca subsp. ochroleuca, Amaranthus spinosus,

Senna occidentalis, Malvastrum coromandelianum, Phyllanthus fraternus, Ricinus communis, Agave americana and A. sisalana.

In the villages, numerous large Adansonia digitata (Alternative 1 and 2) are present and it is recommended that the power line must follow a corridor to the west of these large trees. Other protected species in this area include Sclerocarya birrea and Philenoptera violacea. North of the town area (cultivated lands), some large Adansonia digitata trees are present.

None of the four red data species listed will occur on site, as there is no suitable habitat present. With regards to the sensitivity rating, the “medium sensitivity” rating of the Screening Tool Report can be lowered to “low” as none of the listed species were present, probably to loss of habitat and exploitation. When adding the changes noted in the natural vegetation, including the increased degradation on the mountains, it is evident that the scarce species are under severe threat in the area.

The sensitivity of the vegetation and habitat (CBA 1 zoning) on the mountain has been modified. Although no formal assessment was conducted, it is fair to note that the CBA1 classification can be modified to CBA 2 or even ESA1. The area has been modified during the last few years (15 – 20 years) and the impacts from wood harvesting and grazing are harming the integrity of the natural vegetation composition.

Access to the four substation alternatives is from the southeast along the dirt road from Makwilidza. The vegetation at all sites is modified due to wood harvesting, grazing, trampling and cultivation of cash crops. The presence of some water resources is noted and include the Mulondodi River approximately 1.3 km south of the sites and the drainage lines (adjacent to Alt 2 and 4) and impoundments (near Alt 4).

Very little animal activity (apart from domestic) was noted. Some droppings of Leporidae (probably *Lepus capensis* and *Lepus saxatilis*), small Bovidae (probably *Sylvicapra grimmia*) and quills of *Hystrix africaeaustralis* were noted. In addition, some burrows, and tracks (very few) of rodents were noted. The high impact on the general habitat and loss of natural vegetation contributes to the low incidence of biota. No frogs were observed or heard during the survey in the vicinity of the Mutale River and the associated riparian vegetation. Only a few reptiles (in the mountain area – mainly lizards) were observed.

10.6.3 Conclusions and Recommendation

From an ecological perspective, it is recommended to use Alternative 3 for the proposed new Mutshikili Substation as it is the furthest from any drainage lines and will lower the impacts on the water

resources. The corridor (Alternative 2) following the “valley floor” is more acceptable due to the current impacts. It will ensure easy access during construction and limited clearing of trees and shrubs is needed. With careful planning during the layout of the final pylon positions, it will be possible to avoid large trees, including the protected species and the other indigenous species present. The development of the power line and substation will have a negligible impact on the faunal component. The following mitigations should be implemented:

- No animals must be harmed during construction.
- Limit activities during construction to lower the loss of vegetation.
- Only allow traffic in the approved substation footprint and access road.
- Ensure disturbed areas are managed to prevent erosion.
- After rain events, ensure no erosion occurs on exposed areas – if erosion is noted, rehabilitation actions must be taken immediately.
- Clearing of all-natural vegetation must be limited. To alleviate the issue, the following is recommended:
    i. The current alignment is along a double circuit servitude 48m wide and this limits the placement of structures to avoid impacts on the sensitive vegetation and landscape.
    ii. It is recommended that single steel pylons are used.
    iii. Clearing must be done only 6m wide – 3m on either side of the centre line, with trimming needed at a 45˚ angle to accommodate the conductors.
    iv. At the Mutale River crossing and over the mountain, it is recommended to use the 24m structures – this will lower the need to clear riparian vegetation and will ensure a single span on either side of the river and with a structure at the foot of the mountain (south and north) with a structure on the crest.
    v. On the mountain, a 1m corridor is recommended for carrying material and stringing. A 1m clearing can be made for steel stays were needed. No clearing of the basal layer should be lower than 350mm.

10.7 Geotechnical Investigation

The Geotechnical investigation was carried out by Thoka Geosciences (Pty) Ltd, and the full report is attached as **APPENDIX E-6.**

10.7.1 Findings

The site is underlain by alluvium sand and a river–terrace of the Quaternary era. This is underlain by pink quartzite, sandstone, minor conglomerate and shale of Wyllies Poort Formation, Soutpansberg Group, Mokolian Era. No structural feature traverses the site. Based on the laboratory test result, the soil can be classified as well-graded sand with silt and a low potential expansiveness. The soil is non-plastic and classified as G7 to G8. The friction angle varies between 35 and 36 degrees and the angle

of cohesion very between o and 3 kPa. The Ph varies between 6.27 and 6.64 while the electrical conductivity varies between 0.012 to 0.015. The soil has a poor CBR value. The UCS test performed on stabilised sample yielded a good result. The following steps shall be adhered to during foundation base preparation.

✓ Remove 0.3m of topsoil and store it for reused during landscaping

✓ Removed 0.3m to 3m of alluvial sand and store it for reuse as construction materials

Backfill the excavated area in the following manner:

Option 1:

Stabilised the excavated sand with 5% PPC cement, 32.5N and add the G5 to reach the desired elevation.

Option 2:

Replace the over-excavated material with a 1.5m thick G6 overlay and by 1.8m thick G5. These should be constructed in 150mm layers and compacted to 93% Mod AAHSTO density at OMC.

10.8 Hydrological Assessment

The Hydrological study and a 1:100-year floodline determination of the proposed 132KV powerline was carried out by Zara Capital Consultants and the summaries indicated below are excerpts from the Hydrology Report is attached in **Appendix E-7**

10.8.1 Impact Assessment

'Excerpt from the Hydrological Assessment'

- The flood lines extent coarsely determine from the 20m contours will overtop the floodplains and some of the cultivated land around the proposed construction sites. This results in a wider flood line towards the northern banks of the Mutale River. The 1:100-year flood lines for Routes 1 and 2 are shown in the maps overleaf.

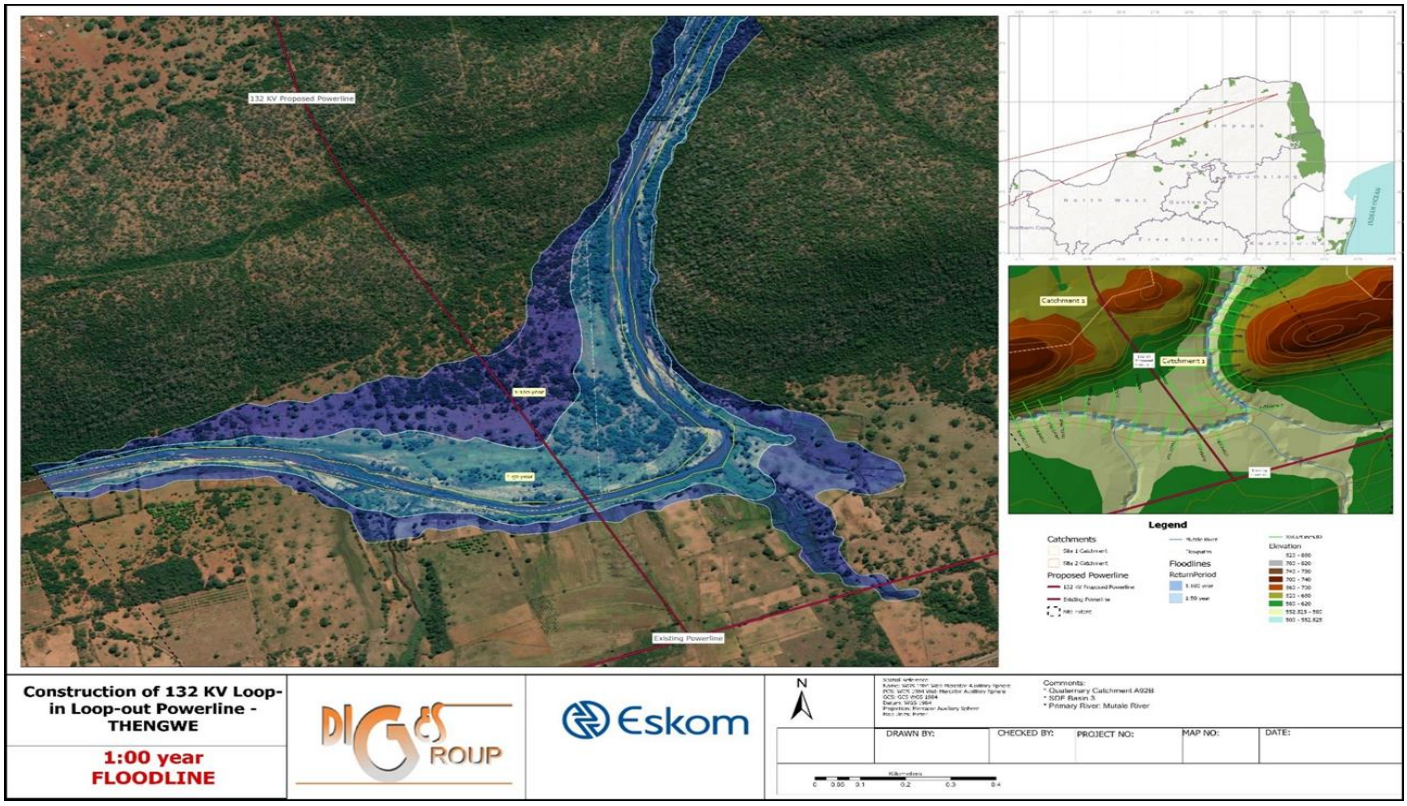


Figure 10-1: 1:100-year floodline for Corridor 1 of the 132 KV powerline (Mutale).

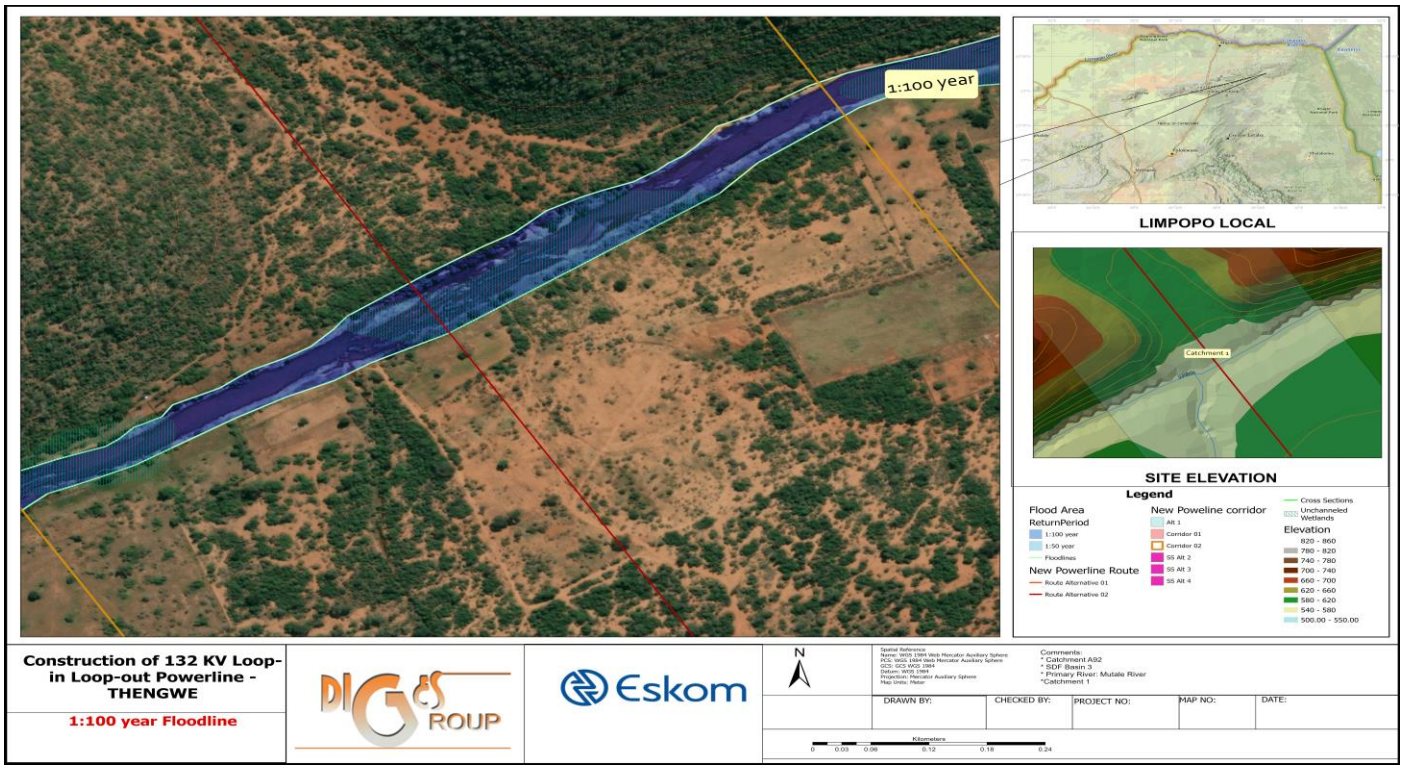


Figure 10-2: 1:100-year floodline for Corridor 2 of the 132 KV powerline (Mutale)

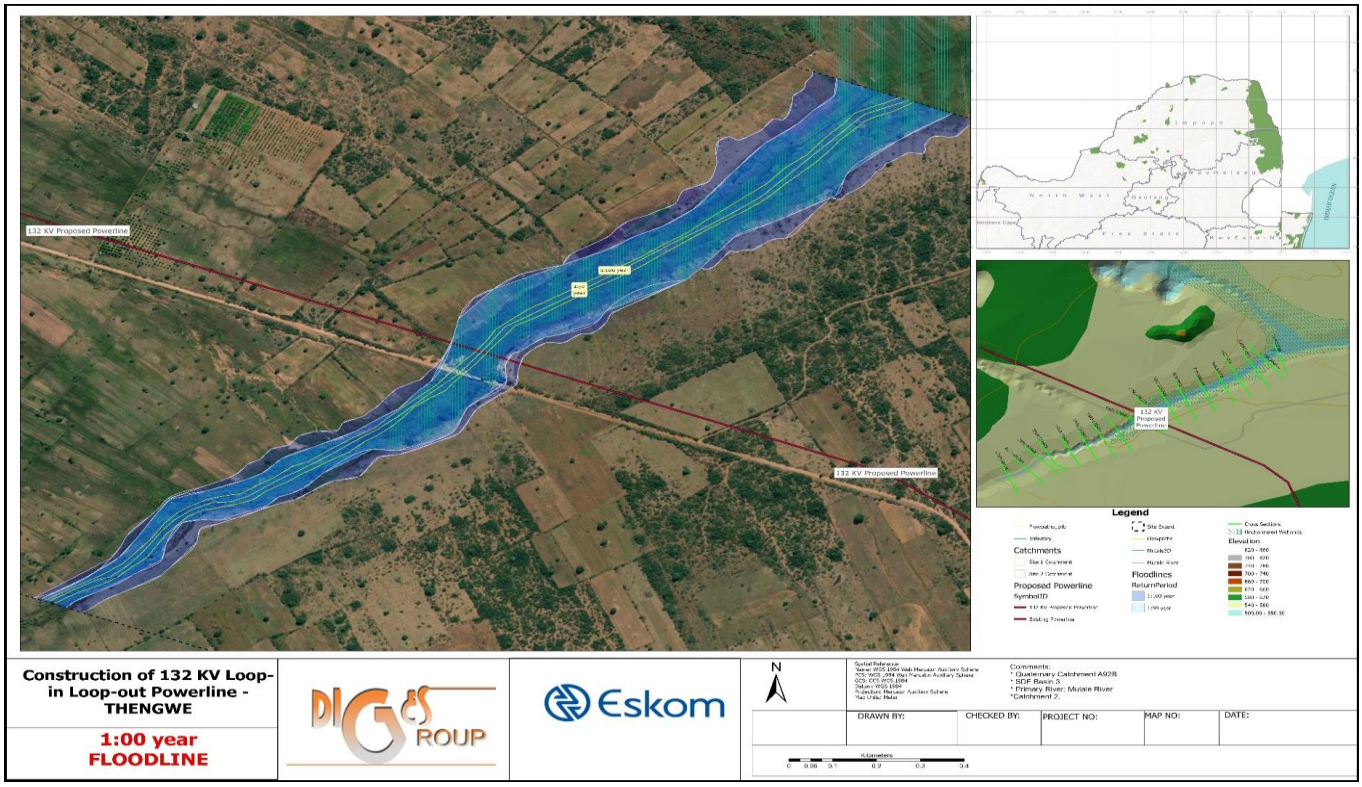


Figure 10-3: Upstream 1:100-year floodline for the 132 KV powerline in catchment 2. Corridors 1 and 2 share the same path within this catchment (Mulondi)

The water resources within the Mutale catchment face moderate pressures due to the utilization of groundwater and surface water systems. The catchment's wetland system is particularly affected by erosion, sedimentation, the presence of undesirable plant species, and infestations of aquatic fauna. The increase in subsistence farming within the catchment has led to the prominence of artificial drainages.

10.8.2 Recommendations

The following recommendations must be implemented:

- Use best management practices for erosion and sediment control: Implement best management practices for erosion and sediment control, such as silt fences, sediment basins, and sediment traps. This will help to prevent soil erosion and sedimentation into the river during construction.
- Runoff from dirty areas should not be allowed to flow into the stream, unless DWS discharge authorization and compliance with relevant discharge standards as stipulated in the NWA is obtained.
- Prevent water from flowing through the areas under construction by temporary diversion as well as undertaking the work in the dry season if possible.

- Use non-toxic materials for construction, such as non-toxic lubricants and hydraulic fluids, to reduce environmental impact.
- Remove alien invasive plants, along the floodplains (catchment 1), to encourage channeled drainage.
- Minimize the clearing of vegetation: Clear only the minimum amount of vegetation required for the construction of the powerline. This will help to minimize the impact on the ecosystem and reduce soil erosion and sedimentation into the river.
- Construction of the proposed power line is carried out during dry periods where there is no storm flow, alternatively done in phases to allow temporary diversion of flow during construction.
- Ensure that even small drainage channels are identified and incorporated to design sufficient capacity.
- Ongoing surface water monitoring is imperative during all phases of the project life and post closure to allow for early detection of potential contaminants that may cause unforeseen negative impacts on the receiving environment.

10.9 Desktop Paleontological Impact Assessment

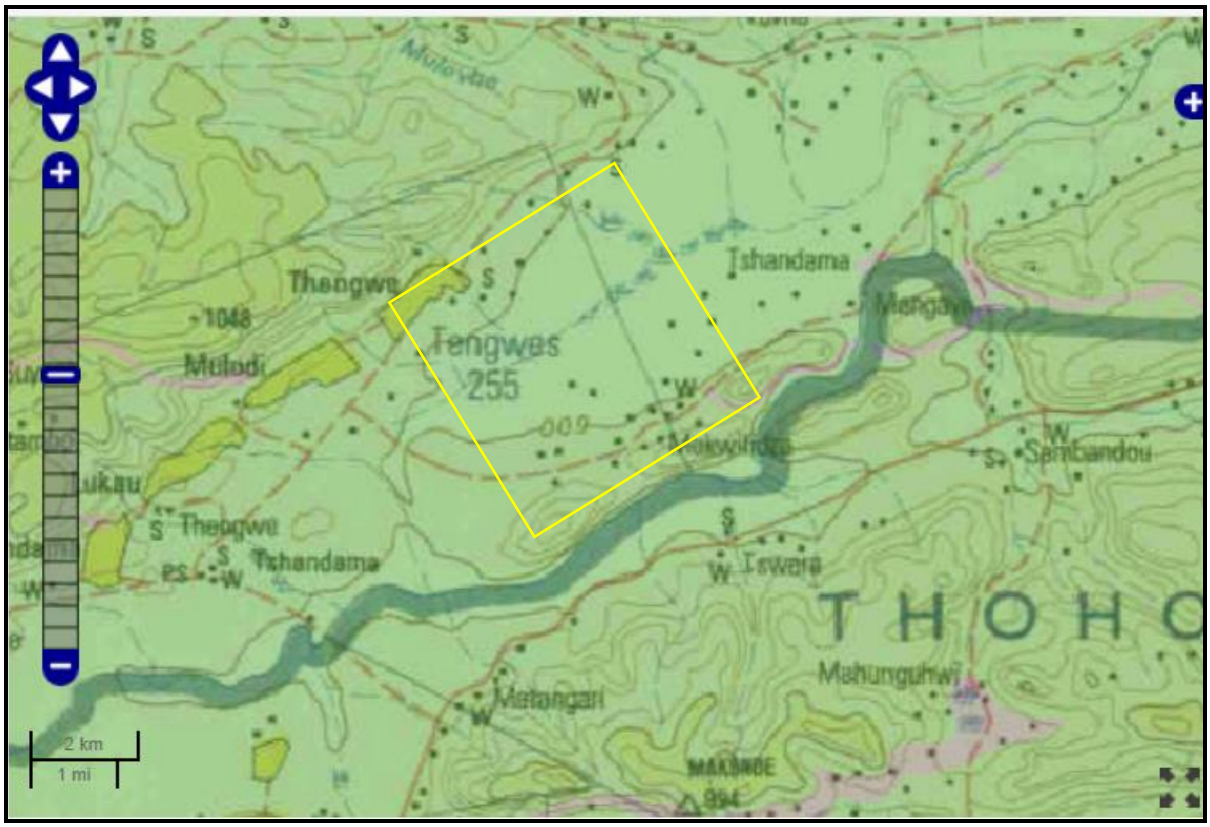
A desktop study was undertaken by Prof Marion Bamford and the report is attached in Appendix E-8. The Terms of Reference were to undertake a PIA and provide feasible management measures to comply with the requirements of SAHRA.

10.9.1 Assumptions

Based on the geology of the area and the paleontological record it can be assumed that the formation and layout of the dolomites, sandstones, shales, and sands are typical for the country and do not contain fossil plant, insect, invertebrate and vertebrate material. The sands of the Quaternary period would not preserve fossils.

10.9.2 Assessment

The site for development is in the moderately fossiliferous Wyllies Poort Formation and Quaternary sands. The paleontological sensitivity of the area under consideration is presented in the Figure below.



SAHRIS palaeosensitivity map for the site for the proposed Tshilamba 132 kV powerline routes and substations are shown within the yellow rectangle. Background colours indicate the following degrees of sensitivity: red = very highly sensitive; orange/yellow = high; green = moderate; blue = low; grey = insignificant/zero.

- Quaternary sandstones and alluvium do not preserve fossils because they are friable and reworked but they might transport fossils that have eroded out from the surrounding areas. The sands in the Thengwe basin are surrounded by Soutpansberg sandstones that do have any fossils. It is very unlikely, therefore, that there are any fossils in the sands and alluvium.
- The geological structures suggest that the rocks are either much too old to contain body fossils or are the wrong kind, Furthermore, the material to be excavated is sands and alluvium and this does not preserve fossils.
- Taking account of the defined criteria, the potential impact on fossil heritage resources is extremely low.

10.9.3 Recommendations

The following recommendations:

- A Fossil Chance Find Protocol should be added to the EMPr.

- If fossils are found by the environmental officer, or other responsible person once excavations for pole and substation foundations, infrastructure and amenities have commenced then they should be rescued, and a palaeontologist called to assess and collect a representative sample.

10.10 Visual Impact Assessment

The Visual Impact Assessment was undertaken by BioAssets. The full report is attached in Appendix E-9.

10.10.1 Impact Assessment

'Excerpt from the Visual Assessment'

During the field survey, the possible visual impacts were noted. The visual disturbance for the most part of the power line corridors (Alternative 1 and 2) (more than 5 km) will be in an area close to the areas inhabited by the local communities or the open cultivated fields and grazing pastures.

- No high natural vegetation is present that will act as an effective screen of the proposed development.
- Limited screening was noted from the tar road south of the T-off point in Tswera.
- The distance to the mountain north of the Mutale River will have a partial positive impact on screening, but the corridor and structures will be visible (moderate to high visual impact).
- Only a short section (approximately 900 m) of the proposed power line (Alternative 1) and approximately 1 200m (Alternative 2 – if that corridor is selected) will cross the mountains. Although the natural vegetation is denser, the trees are not higher than 5 m and will give very little screening to the local community near the Mutale River.
- Structures at the substation will be higher (10 – 15m) than the surrounding vegetation and therefore will not be screened by the trees and shrubs.
- Both the nature reserves, the Mphaphuli Nature Reserve (south of the proposed development) and the Thengwe Nature Reserve (north of the substation site), are within a 10km radius from the project. None will have any visual disturbances related to the development, as the mountains will be a visual barrier for both the reserves.
- The existing visual impacts (power lines, telephone infrastructure, farming activities and town developments) is high. The additional impact from the power line will be very small in the Tswera and Makwilidza areas, but moderate to high north from Makwilidza to Thengwe.

10.10.2 Conclusion and Recommendations

The visual resource rating will be **low** since the area is "highly modified with extensive infrastructure development (towns and villages), power lines, roads, settlements, telephone and communications

towers and agricultural activities i.e., cultivation and grazing. From a visual exposure perspective, the new development will have a substantial impact on the receiving communities. The larger trees in the riparian zone of the Mutale River will have a limited barrier effect from a visual perspective. The high pylons with the conductors will be visible along the largest part of the corridor. Although the structure at the substation is **low** (mostly a single story), the exposed nature of the site will result in being visible from all directions. Taking all the above information into account, the impact from the lights at the substation during the nights must be noted. The following major measures are recommended:

- ✓ It is recommended that all pylons for lights in the substation footprint must be as low as possible, preferably not higher than any other structures.
- ✓ It is recommended that the lights must face towards the activities to lower the potential light pollution towards the surrounding landscape.
- ✓ Lights must be managed – only use the lights in areas where physical activities are ongoing, the rest must be switched off.

When evaluating the visual impacts related to the four sites, all have a similar negative and high visual impact. There is no dense and high natural vegetation to screen the infrastructure from residents and tourists using the road or from household in the vicinity of the proposed development.

10.11 Wetland Delineation

The Wetland Delineation carried out by Envirosheq Consulting in 2019 was revised in October 2022 to consider the additional substation alternatives and to re-assess if any changes have occurred. The updated report is attached as **APPENDIX E-4.**

10.11.1 Assumptions and Limitations

- The findings, results, observations, conclusions, and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on wetlands and watercourses.
- Wetland boundaries are essentially based on GPS coordinate waypoints taken onsite of wetland indicator features. The accuracy of the GPS device therefore affects the accuracy of the maps produced. A hand- held Garmin Montana 680 was used to delineate the wetland boundaries.
- The assessment of the present ecological state (PES), the provision of ecosystem goods and services, and the ecological importance and sensitivity of the identified wetland systems was based on a one- day field investigation conducted on the 27th of October 2019.Due to scope change another site visit was undertaken in October 2022 and July 2023 to amend the report and accommodate assessments on the new project scope.

- The assessment of impacts and recommendation of mitigation measures was informed by the site-specific ecological issues arising from the field survey and based on the assessor's working knowledge and experience with similar development projects. No construction work methodology was provided.

10.11.2 Impact Assessment

'Excerpt from the Wetland Delineation Assessment'

- The main wetland indicators used during the wetland delineation process included the terrain unit indicator, soil wetness indicator, and the presence or absence of hydric soils and hydrophytes.
- Two channelled valley bottom wetlands and a river floodplain were identified where **Wetland A** refers to the wetland or drainage line section located at the proposed sites earmarked for the development of the Mutshikili substation (Alternative substation Site 2 & 4) at Thengwe and **Wetland B** refers to the wetland section delineated almost midway point from the proposed Mutshikili sub-station site towards the two villages Makwilidza and Maheni. **Wetland C** refers to the section where the proposed powerline crosses the Mutale River from the Makonde T-off near Tswera.
- From a functional perspective, wetlands within the study area serve to improve habitat within and downstream of the study area through the provision of various ecosystem services such as streamflow regulation, flood attenuation, groundwater recharge, sediment trapping, toxicant removal, particle assimilation and provision of other natural resources.
- The impact is anticipated mainly at the crossing points of the river floodplain, riparian zones and the NFEPA wetland. There is substantial environmental sensitivity, with the Mutale watercourses (CBA areas) and their surrounds and the NFEPA wetlands being the primary features of concern.
- The EIS was determined to be Very High, High and Low / Marginal for Sections C, B and A respectively. The Ecological Management Class (EMC) was determined to be A, B & D respectively whilst the Present Ecological Status (PES) was determined to be B, B and C respectively.

10.11.3 Conclusion and Recommendations

The impact is anticipated mainly at the crossing points of the river floodplain, riparian zones and the NFEPA wetland however the study has found no potential impacts that could be fatal flaws. Despite this, there is substantial environmental sensitivity, with the Mutale watercourses (CBA areas) and their surrounds and the NFEPA wetlands being the primary features of concern. The potential impacts on the systems have been assessed. Key concerns include damage to the wetland and riparian vegetation, and to the deposition of sediment and waste materials into the systems. It will be possible to mitigate against the impacts and recommendations in this regard have been put forward. The preferential sequential order as per the site visit is as follows:

- ❑ Substation Site Alternative 3 is the most preferred whilst Substation Site Alternative 2 is the least preferred.

The major recommendations are.

- Any construction-related waste must not be placed in the vicinity of the wetland features; and
- Limit the footprint area of the construction activity to what is essential to minimize environmental damage.
- Monitor the wetland features for erosion and incision.
- Maintain the REC for each of the wetland features, as stated within the report during the life of the development; and
- Implement an alien vegetation control program within the wetland features and ensure the establishment of indigenous species within areas previously dominated by alien vegetation.

10.12 Civil Aviation

The analysis contained in this Civil Aviation Site Sensitivity (CASS) has determined that the powerline and associated ground-based infrastructure would not materially impact radar or navigation infrastructure in the environs, nor present any material additional risks to operations at any nearby aerodromes, within the contemplation of the 2020 Protocol. On this basis, therefore, it is recommended that the Sensitivity Classification of the proposed development be amended to low, The Site Sensitivity Report is attached in Appendix E-11.

11 SUMMARY OF BASIC ASSESSMENT

The “feasibility” and “reasonability” of the corridor was measured against the general purpose, requirements and need of the activity and how it impacts on the environment and on the community that may be affected by the activity. It was therefore vital that the identification, investigation, and assessment of the corridor address the issues/impacts of the proposed development. To strengthen the Tswera grid, Eskom intends to construct a 132kV loop in loop out power line and Mutshikili substation. A Basic Assessment was therefore undertaken as per the EIA Regulations, GN326 as amended. The preliminary investigations and consultations undertaken indicated that there are sections of the area where challenges were experienced with the Tribal Authorities. This resulted in having only one route and corridor being assessed. The area is generally characterized by Critical Biodiversity Areas, residential and subsistence agricultural areas. As such avi-fauna, Biodiversity, Heritage, and Wetland Delineation specialist studies were undertaken to fully assess the potential impacts. Based on the outcome of this assessment, the EAP must recommend to the Department of Environmental Affairs whether the project should be approved and the conditions and/ stipulations of such approval. The recommendations are based on:

- The information provided by the applicant with regards to the project activities.
- Legislative requirements.
- Assumptions and limitations during the assessment.
- The specialists input.
- Geographic Information Systems.
- The public input, i.e., stakeholders and interested and affected parties; and
- The EAP’s professional experience.

In summary, the key findings identified in this assessment are detailed below:

The project area is classified as rural with the proposed corridors traversing across similar land types and other geographical features. The area falls within Soutpansberg Important Bird Area, Vhembe Biosphere Reserve and NFEPA Fish Sanctuary. In addition, it is also classified as CBA and ESA which are required to meet biodiversity targets and are also important for supporting ecological processes. The communities within the area largely rely on subsistence farming and small-scale businesses with most agricultural activities being in the valley, and the low-lying areas closer to the water sources, the Mulondodi and Mutale Rivers. In addition to agricultural activities, the area south of the Mutale River is characterized by problems related to alien invasives and erosion. On the southern slopes of the

mountain, the vegetation is in fair to good condition whilst on the ridge and the top of the northern slope, the vegetation is in a good condition, but as one moves towards the lower slopes and foot of the mountains, the natural vegetation integrity deteriorates. This is linked to grazing, trampling and wood harvesting. The wetlands and a river floodplain identified serve to improve habitat within and downstream of the study area through the provision of various ecosystem services such as streamflow regulation, flood attenuation, groundwater recharge, sediment trapping, toxicant removal, particle assimilation and provision of other natural resources. Impact is anticipated mainly at the crossing points of the river floodplain, riparian zones and the NFEPA wetland. Impact is anticipated mainly at the crossing points of the river floodplain, riparian zones and the NFEPA wetland however the study has found no potential impacts that could be fatal flaws. Despite this, there is substantial environmental sensitivity, with the Mutale watercourses (CBA areas) and their surrounds and the NFEPA wetlands being the primary features of concern. The only sign of sites of heritage potential were mostly graves, and these can be avoided. There is also a high chance of finding archaeological sites and this will be difficult to avoid since most of these are trifling, and often hidden underground, only exposed once construction begins. Alternative 1 will have a higher visual impact to residents and travelers south and north of the mountain and if the corridor for Alternative 2 is restricted to the valley between the mountains, the visual impact will be lowered compared to a corridor on the mountains east and west of the low-lying area.

In terms of agriculture, construction impacts are anticipated to be **low to moderate** and can be further reduced to **low** with the implementation of mitigation measures. From an avi-fauna perspective, the habitat of the project area and the risk posed to power line sensitive red list avifauna is **low to moderately** sensitive collision of birds and habitat transformation poses a **moderate risk** which can be reduced to low with mitigation measures whilst the risk posed by collisions is anticipated to be **low**. The archaeologist has rated the impacts on archaeological resources to be **low** and the aquatic, hydrology and wetland delineation has rated the significance of impacts on water resources to be **low.** The powerline and substation will be highly visible to the residents. The archaeological, biodiversity, hydrology, visual and wetlands specialists prefer Corridor 2 whilst the agricultural and avifauna prefer Corridor 1. It should however be noted that both corridors are viable with the implementation of mitigation measures. Substation 3 is generally recommended. Reference is made to the figure overleaf for the Sensitivity Map for the preferred corridor and preferred substation site.

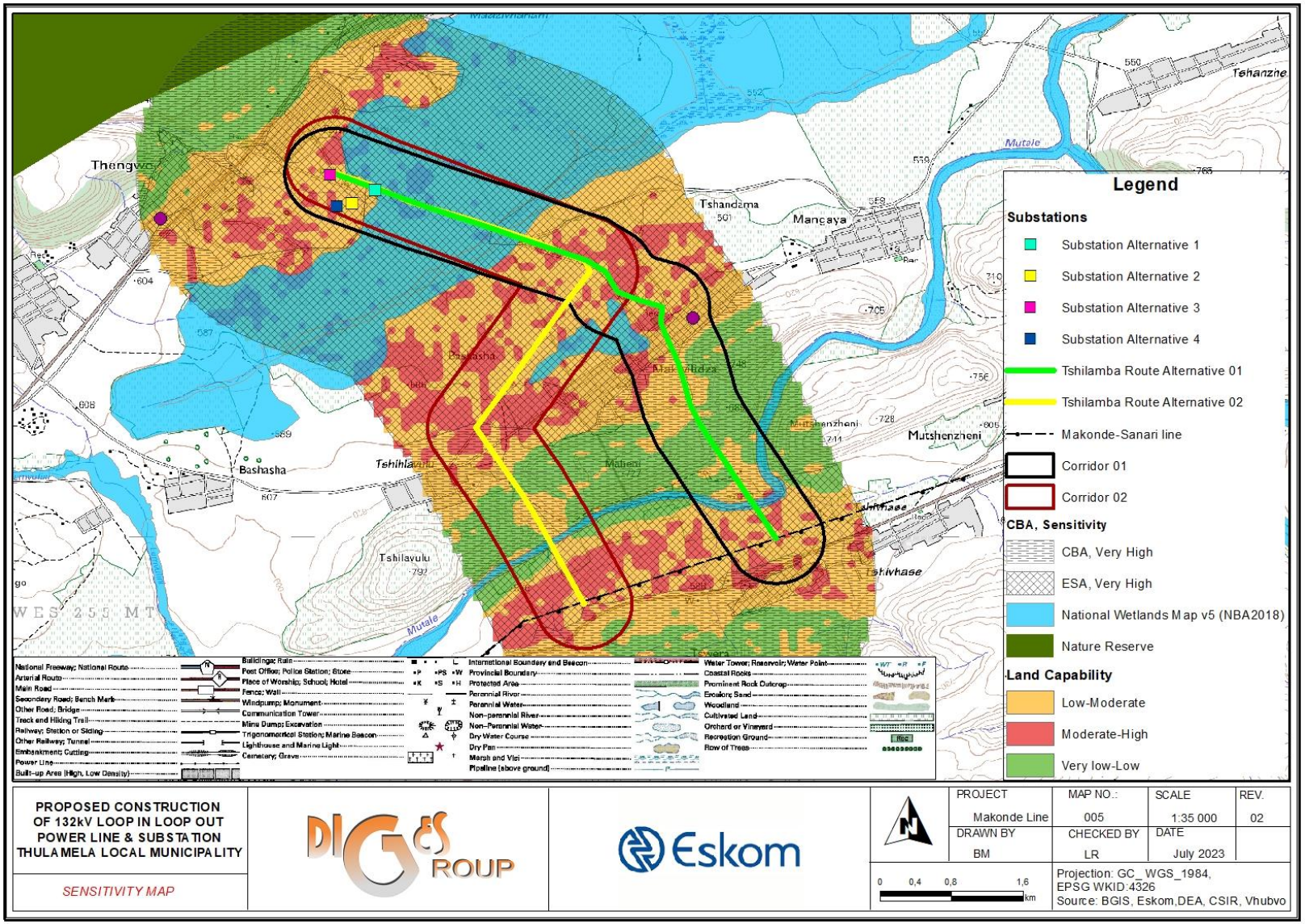


Figure 11-1: Sensitivity Map

12 ENVIRONMENTAL IMPACT STATEMENT

Cognizance is taken that the area where the corridor traverses the low mountain is pristine, rich in biodiversity and is required to meet biodiversity targets. However, there is also a need to strengthen the grid to ensure the continuous provision of a basic service to the locals thereby indirectly boosting their 'well-being' and the regional economy. All the specialist studies undertaken have indicated that the project is viable and should all the mitigations measures stated be effectively implemented. In the interest of sustainable development, and considering the cost of construction the powerline and the substation, I as an EAP recommend the powerline corridor alternative 2 and Substation Alternative 3 be authorized subject to the following recommendations being included in the Environmental Authorization:

- Powerline corridor two should be moved more to the edges of the crop fields to avoid the intensive disruption of farming.
- The stipulations and provisions of the attached Environmental Management Programme on Appendix H-1 and H-2 be conveyed to and familiarized by the contractor and workers responsible for construction.
- The final powerline alignment must be inspected on foot by the avifaunal, biodiversity and heritage specialists prior to construction to ascertain if any Red Data species, avi-faunal nests, protected tree species and archaeological objects are present.
- Permits required by Eskom SOC Ltd from other competent authorities should be acquired before the commencement of the activity.
- An Environmental Control Officer (ECO) must be appointed to oversee the construction process and ensure compliance with conditions of approval.
- A structure should be placed on the ridge to ensure that there is no need for other structures on the southern slope, as this area is very steep and sensitive (vegetation in good condition, high erosion potential).
- A vulture-friendly pole design must be utilized to avoid electrocution.
- The development footprint area should remain as small as possible and should not encroach onto surrounding areas beyond the proposed / approved route.
- Ensure that only essential activities must occur within the wetland features which are traversed by the proposed powerline route, all other non-essential activities should occur outside of the freshwater features; the wetland areas not indicated within the linear developments' footprint are off-limits to construction vehicles and personnel.
- Restrict construction to the drier winter months, if possible, to avoid sedimentation of the wetland features and to minimize the severity of disturbance of the wetland habitat.
- Access to the construction site should be limited to a single-entry point to minimize compaction of soils, loss of vegetation and increased erosion.

- Ensure that a Waste Management Plan is in place prior to construction of the power line and associated infrastructure.
- Construction activity should be restricted to the immediate footprint of the infrastructure.
- The river and associated buffers must be treated as sensitive environment areas: caution must be exercised near the watercourses.
- Drainage must be controlled to ensure that runoff from the project area does not culminate in off-site pollution, flooding or result in any damage to properties downstream of any storm-water discharge point(s).
- Only clear larger vegetation that will impact directly to the conductors. No total clearing of the basal layer" must be allowed in the Critical Biodiversity Areas.
- Re-vegetate cleared soil after construction, for the control of soil erosion and water capacity.
- Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the power line and take immediate corrective action where invasive species are observed to establish.
- All towers must be placed at least 32m from any drainage lines and streams.
- To ensure that health impacts are minimized, structures are not permitted to be constructed underneath the conductors of a distribution line (i.e., within the servitude). In addition, this fulfils safety requirements, ensuring that no person can have physical contact with a line conductor.

The co-ordinates for the recommended corridor are as follows:

Start: 22° 45' 0,760" S, 30° 36' 54,080" E
Mid-point: 22° 43' 30,626" S, 30° 35' 56,144" E
End: 22° 42' 48,409" S, 30° 34' 13,475" E
Substation Centre Co-ordinates: 22° 42' 48,409" S, 30° 34' 13,475" E

Reference is made to Figure 12-1 for the recommended corridor and substation.

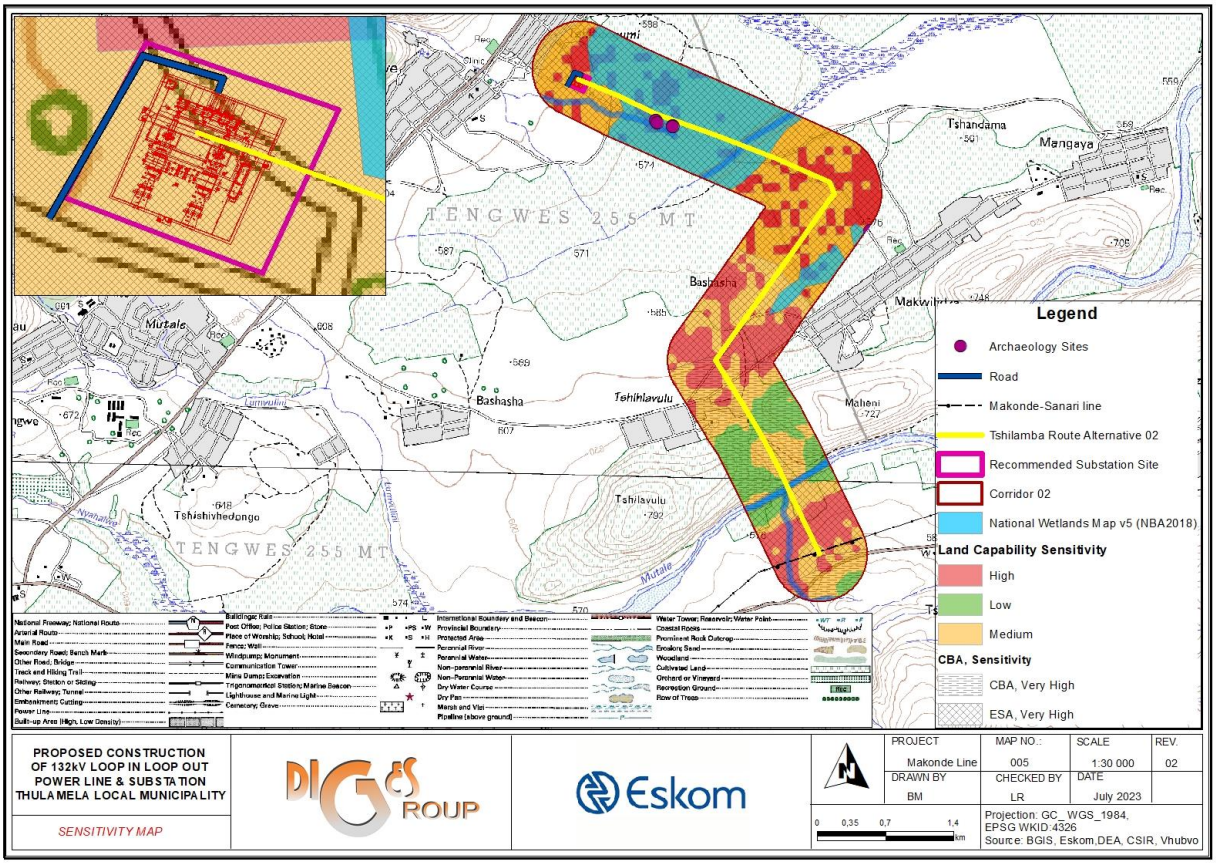


Figure 12-1: Recommended Corridor and Substation

13 ENVIRONMENTAL MANAGEMENT PROGRAMME

The mitigatory measures recommended describe possible actions for the reduction of the significant negative environmental impacts identified in the assessment. As per Government Notice 435 of March 2019, a project that entails the construction of power lines and substations should submit a generic EMPr as developed by the Competent Authority. The plan provides guidelines for the planning, construction, operation, maintenance of the proposed power line and substation, as well as a holistic management and monitoring plan for the entire project. The relevant Sections as determined have been completed and the EMPrs are appended to this report in Appendix H-1 and H-2.

14 THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED.

Environmental Authorization will be required for ten (10) years. The project requires additional permits/Licenses such as Water use Licence (General Authorization) and Tree removal permits, and these can take about 4 months to obtain.

15 DECLARATION OF DISCLOSURE

DIGES Group undertakes to disclose to the Competent Authority any material information that has or may have the potential to influence the decision of the Competent Authority or the objectivity of any report or document required in terms of National Environmental Management Act (Act No. 107 of 1998) and will provide the Competent Authority with access to all information at its disposal regarding the application, whether such information is favourable to the application or not.

12 September 2023

Signature **Date**

16 ANY SPECIFIC INFORMATION THAT MAY BE REQUIRED BY THE COMPETENT AUTHORITY

The EAP is not aware of any specific information that may be required by the Competent Authority.

17 ANY OTHER MATTERS REQUIRED IN TERMS OF SECTION 24 (4) (A) AND (B) OF THE ACT

None.

18 CONCLUSION

The independent EAP has undertaken the Basic Assessment process for the proposed project as per the legislation. The project poses positive and negative impacts on the environment. Specialist reports were prepared and recommendation for mitigation of the impacts have been provided. The Public Participation Process was done in accordance with Chapter 6 of the EIA Regulations, 2017 (as amended) and comments and input received to date have been addressed and incorporated in this report. Based on the outcome of the specialist work done, engagement with the I&APs, authorities and landowners, the EAP recommends that the project be approved provided that the mitigation measures outlined in this report and the EMPr are implemented.

19 REFERENCES

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