

Draft Basic Assessment Report

Eskom Entokozweni and Tekwane North substations and 132kV power line

DFFE REF: 2021-04-0010

MAY 2021



ESKOM ENTOKOZWENI AND TEKWANE NORTH SUBSTATIONS AND 132KV POWER LINE

ENVIRONMENTAL IMPACT ASSESSMENT
DRAFT BASIC ASSESSMENT REPORT
DFFE REFERENCE: 2021-04-0010
DATE MAY 2021

Compiled by:

Setala Environmental
P.O. Box 36593
Menlopark, 0102
Contact person:
Ria Pretorius
Tel +27(0)82 568 6344
Fax +27(0)86 675 4026
Email ria@setalaenvironmental.co.za

Applicant:

Eskom Holdings SOC LTD
Mpumalanga Operating Unit
P.O. Box 1567
Nelspruit, 1200
Contact person:
Josiah Zungu
Tel +27(0) 76 231 5893
Email zunguj@eskom.co.za



TABLE OF CONTENTS

TABLE OF CONTENTS	3
GLOSSARY OF TERMS	5
ACRONYMS	9
1 INTRODUCTION	10
2 APPROACH TO THE BASIC ASSESSMENT PROCESS	10
3 PROJECT LOCALITY	11
4 PROPERTY DESCRIPTION	12
5 PROJECT DESCRIPTION	12
6 COORDINATES OF DEVELOPMENT PROPOSAL	14
7 PHYSICAL SIZE OF THE ACTIVITY	16
8 ACCESS TO THE SITE	17
9 TOPOGRAPHY	17
10 GRADIENT OF THE SITE	18
11 LOCATION IN LANDSCAPE	18
12 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE	18
13 GROUND COVER	18
15 SOCIO-ECONOMIC ASPECTS	19
16 NEED FOR THE PROJECT	20
17 LEGAL REQUIREMENTS	22
1 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES	22
2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT	23
18 FEASIBLE AND REASONABLE ALTERNATIVES	27
1 POWER LINE ROUTE ALTERNATIVES	28
2 SUBSTATION LOCALITY ALTERNATIVES	30
3 NO-GO ALTERNATIVE	32
19 SPECIALIST INPUT	32
1 BIODIVERSITY ASSESSMENT	32
2 AVIFAUNAL ASSESSMENT	36
3 HERITAGE IMPACT ASSESSMENT	41
4 PALEONTOLOGICAL SENSITIVITY	43
20 SPATIAL DEVELOPMENT TOOLS	44
1 NATIONAL PRIORITY AREAS	45
2 MPUMALANGA CONSERVATION PLAN	45
3 NATIONAL ENVIRONMENTAL SCREENING TOOL	46
21 PUBLIC PARTICIPATION	48
1 ADVERTISEMENT AND NOTICE	49
2 PUBLIC NOTIFICATION	49
3 MEETINGS AND SITE VISITS	50
4 DISTRIBUTION OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENT	50
5 COMMENTS AND RESPONSE REPORT	51
6 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES	51
7 CONCLUSION OF PUBLIC PARTICIPATION PROGRAMME	52
22 IMPACT ASSESSMENT	52
1 PLANNING AND DESIGN PHASE	54
2 CONSTRUCTION PHASE	56
3 OPERATIONAL PHASE	67
4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE	69
5 ENVIRONMENTAL IMPACT STATEMENT	69
6 IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE	70
23 RECOMMENDATION OF PRACTITIONER	71
24 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)	72
25 THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED	72
26 CONCLUSION	72

Eskom Entokozweni and Tekwane North substations and 132kV power line

APPENDIX A MAPS

1. *Site Location Authorised 2015 vs new application 2021*
2. *Site Location Alternatives - topographical map*
3. *Site Location Alternatives – google earth*
4. *Site Location Entokozweni sub – google earth*
5. *Site Location Entokozweni-Tekwane North 132kV line – google earth*
6. *Site Location Tekwane North sub – google earth*
7. *Sensitivity map - topographical - Alternative 1 & 2*
8. *Sensitivity map - topographical - Alternative 1/proposal*
9. *Sensitivity map - google - Alternative 1 & 2*
10. *Sensitivity map - google - Alternative 1/proposal*
11. *Critical Biodiversity Areas*
12. *Priority Areas*
13. *Site Location kml*

APPENDIX B PHOTOGRAPHS

APPENDIX C FACILITY ILLUSTRATIONS

1. *Images of distribution power line structures*
2. *Image of typical substation*

APPENDIX D SPECIALIST REPORTS

1. *Biodiversity Assessment*
2. *Avifaunal Impact Assessment*
3. *Heritage Impact Assessment*

APPENDIX E PUBLIC PARTICIPATION

1. *Proof of placement of advertisements*
 - a) *Proof of newspaper notice*
 - b) *Proof of site notices*
2. *Proof of written notification*
 - a) *Background Information Document (BID) and Registration sheet*
 - b) *Submission of notification letters*
 - c) *Submission of draft Basic Assessment Report – to follow in FBAR*
3. *Comment received*
 - a) *Written comment received in the notification phase*
 - b) *Written comments received on the DBAR – to follow in FBAR*
4. *Registers*
 - a) *Register of I&APs*
5. *Correspondence and minutes of meetings*
 - a) *Public information meetings/virtual meetings – to follow in FBAR*
6. *Comments and Response Report*

APPENDIX F ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

1. *Generic Environmental Management Programme (EMPr) for the development and expansion of infrastructure for the overhead transmission and distribution of electricity*
2. *Generic Environmental Management Programme (EMPr) for the development and expansion of substation infrastructure for the transmission and distribution of electricity*

APPENDIX G DETAILS OF EAP AND EXPERTISE

APPENDIX H SPECIALIST'S DECLARATION OF INTEREST

GLOSSARY OF TERMS

Activity (Development) – an action either planned or existing that may result in environmental impacts through pollution or resource use.

Alien vegetation - Alien vegetation is defined as undesirable plant growth (usually of foreign origin) which includes, but is not limited to all declared category 1 and 2 listed invader species as set out in the 1983 Conservation of Agricultural Resources Act (CARA) regulations. Other vegetation deemed to be alien are those plant species that show the potential to occupy in number any area within the defined construction area and which are declared undesirable.

Alternative – a possible course of action, in place of another, of achieving the same desired goal of the proposed project. Alternatives can refer to any of the following but are not limited to: site alternatives, site layout alternatives, design or technology alternatives, process alternatives or a no-go alternative. All reasonable alternatives must be rigorously explored and objectively evaluated.

Applicant – the project proponent or developer responsible for submitting an environmental application to the relevant environmental authority for environmental authorisation.

Biodiversity – the diversity of animals, plants and other organisms found within and between ecosystems, habitats, and the ecological complexes.

Construction – means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure and excluding the reconstruction of the same facility in the same location, with the same capacity and footprint.

Cumulative Impacts – impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities to produce a greater impact or different impacts.

Direct impacts – impacts that are caused directly by the activity and generally occur at the same time and at the same place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally quantifiable.

Ecosystem – a dynamic system of plant, animal (including humans) and micro-organism communities and their non-living physical environment interacting as a functional unit. The basic structural unit of the biosphere, ecosystems are characterised by interdependent interaction between the component species and their physical surroundings. Each ecosystem occupies a space in which macro-scale conditions and interactions are relatively homogenous.

Emmissions - The release or discharge of a substance into the environment which generally refers to the release of gases or particulates into the air.

Environment – In terms of the National Environmental Management Act (NEMA) (Act No 107 of 1998) (as amended), "Environment" means the surroundings within which humans exist and that are made up of:

- a) the land, water and atmosphere of the earth;
- b) micro-organisms, plants and animal life;
- c) any part or combination of (i) of (ii) and the interrelationships among and between them; and
- d) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and wellbeing.

Environmental Assessment (EA) – the generic term for all forms of environmental assessment for projects, plans, programmes or policies and includes methodologies or tools such as environmental impact assessments, strategic environmental assessments and risk assessments.

Environmental Authorisation – an authorisation issued by the competent authority in respect of a listed activity, or an activity which takes place within a sensitive environment.

Environmental Assessment Practitioner – the individual responsible for planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management programmes or any other appropriate environmental instrument introduced through the EIA Regulations.

Environmental Impact – a change to the environment (biophysical, social and/ or economic), whether adverse or beneficial, wholly or partially, resulting from an organisation's activities, products or services.

Environmental Impact Assessment (EIA) – the process of identifying, predicting, evaluating and mitigating the biophysical, social, and other relevant effects of development proposals prior to major decisions being taken and commitments made.

Environmental Issue – a concern raised by a stakeholder, interested or affected parties about an existing or perceived environmental impact of an activity.

Environmental Management - ensuring that environmental concerns are included in all stages of development, so that development is sustainable and does not exceed the carrying capacity of the environment.

Environmental Management Programme - A detailed plan of action prepared to ensure that recommendations for enhancing or ensuring positive impacts and limiting or preventing negative environmental impacts are implemented during the life cycle of a project. The EMP focuses on the construction phase, operation (maintenance) phase and decommissioning phase of the proposed project.

Expansion - means the modification, extension, alteration or upgrading of a facility, structure or infrastructure at which an activity takes place in such a manner that the capacity of the facility or the footprint of the activity is increased.

Fatal Flaw – issue or conflict (real or perceived) that could result in developments being rejected or stopped.

General Waste – household water, construction rubble, garden waste and certain dry industrial and commercial waste which does not pose an immediate threat to man or the environment.

Hazardous Waste – waste that may cause ill health or increase mortality in humans, flora and fauna.

Incident - An undesired event which may result in a significant environmental Impact but can be managed through internal response.

Indirect impacts – indirect or induced changes that may occur as a result of the activity. These types of impacts include all of the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.

Integrated Environmental Management – a philosophy that prescribes a code of practice for ensuring that environmental considerations are fully integrated into all stages of the development and decision-making process. The IEM philosophy (and principles) is interpreted as applying to the planning, assessment, implementation and management of any proposal (project, plan, programme or policy) or activity – at local, national and international level - that has a potentially significant effect on the environment. Implementation of this philosophy relies on the selection and application of appropriate tools for a particular proposal or activity. These may include environmental assessment tools (such as strategic environmental assessment and risk assessment), environmental management tools (such as monitoring, auditing and reporting) and decision-making tools (such as multi-criteria decision support systems or advisory councils).

Mitigate – the implementation of practical measures designed to avoid, reduce or remedy adverse impacts or enhance beneficial impacts of an action.

No-Go Option – in this instance the proposed activity would not take place, and the resulting environmental effects from taking no action are compared with the effects of permitting the proposed activity to go forward.

Open Space – environmentally sensitive areas which are not suitable for development and consist of watercourses, buffers, floodplains, steep slopes, sensitive biodiversity and/or areas of cultural or heritage significance.

Registered Interested and Affected Party – an interested and affected party whose name is recorded in the register opened for that application.

Rehabilitation – a measure aimed at reinstating an ecosystem to its original function and state (or as close as possible to its original function and state) following activities that have disrupted those functions.

Scoping – the process of determining the spatial and temporal boundaries (i.e. extent) and key issues to be addressed in an environmental assessment. The main purpose of scoping is to focus the environmental assessment on a manageable number of important questions. Scoping should also ensure that only significant issues and reasonable alternatives are examined.

Sensitive environment – any environment identified as being sensitive to the impacts of the development.

Significance – significance can be differentiated into impact magnitude and impact significance. Impact magnitude is the measurable change (i.e. magnitude, intensity, duration and likelihood). Impact significance is the value placed on the change by different affected parties (i.e. level of significance and

acceptability). It is an anthropocentric concept, which makes use of value judgements and science-based criteria (i.e. biophysical, social and economic).

Stakeholder engagement – the process of engagement between stakeholders (the proponent, authorities and I&APs) during the planning, assessment, implementation and/or management of proposals or activities.

Sustainable Development – development which meets the needs of current generations without hindering future generations from meeting their own needs.

Watercourse – means:

- a) a river or spring;
- b) a natural channel or depression in which water flows regularly or intermittently;
- c) a wetland, lake or dam into which, or from which, water flows; and
- d) any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998) and a reference to a watercourse includes, where relevant, its bed and banks.

Wetland – means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.

ACRONYMS

CBA	Critical Biodiversity Areas
CBD	Central Business District
CMA	Catchment Management Agencies
CSIR	Council for Scientific and Industrial Research
DFEE	Department of Forestry, Fisheries and Environment
DMRE	Department of Mineral Resources and Energy
DSOE	Desired State of the Environment
DWS	Department of Water and Sanitation
ECF	Environmental Constraints Framework
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 (Act No. 73 of 1989)
EIA	Environmental Impact Assessment
EIS	Ecological Importance & Sensitivity
EMC	Environmental Management Class
EMP	Environmental Management Plan
EWR	Ecological Water Requirements
GIS	Geographic Information System
HGM	Hydrogeomorphic
IBA	Important Bird Area(s)
IDP	Integrated Development Plan
I&AP	Interested and/or affected parties
MAP	Mean Annual Precipitation
MASL	Metres above sea level
NBA	National Biodiversity Assessment
NEMA	National Environmental Management Act
NFEPA	National Freshwater Ecosystem Priority Areas
NHRA	National Heritage Resources Act
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act
PAES	Protected Areas Expansion Strategy
PES	Present Ecological State
PDA	Primary Drainage Area
PPP	Public participation process
QDA	Quaternary Drainage Area
REC	Recommended Ecological Category (or Class)
REMC	Recommended Ecological Management Category (or Class)
RVI	Riparian Vegetation Index
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SDF	Spatial Development Framework
SDI	Spatial Development Initiative
SEA	Strategic Environmental Assessment
SEMP	Strategic Environmental Management Plan
SWSA	Strategic Water areas of South Africa
WMA	Water Management Areas
WUL	Water Use Licence
WULA	Water Use Licence Application

1 INTRODUCTION

Eskom Holdings SOC Ltd (the applicant) appointed Setala Environmental (Pty) Ltd as the independent environmental assessment practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for a proposed electricity supply project.

An application for authorisation of the project is submitted to the National Department of Environment, Forestry and Fisheries (DFFE), in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations of 2017.

The proposed project is a listed activity in terms of Sections 24(2) and 24(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended). The Environmental Impact Assessment (EIA) Regulations, 2017 promulgated in terms of Chapter 5 of the NEMA provide for the control of certain activities that are listed in Government Notice Regulation (GN R.) No. 327, 325 and 324. Activities listed in these notices must comply with the regulatory requirements listed in GN R. 326, which prohibits such activities until written Authorisation is obtained from the Competent Authority. Such Environmental Authorisation (EA), which may be granted subject to conditions, will only be considered once there has been compliance with the EIA Regulations of 2017. GN R. No. 326 sets out the procedure and documentation that need to be compiled with undertaking a Basic Assessment Process.

The proposed construction of a ± 5 km 132kV chickadee power line and two Substations have been triggered by the rapid expansion of the geographic extent of Tekwane North, hence a need for Eskom to increase the capacity of electricity towards this area. Currently the area is being supplied with electricity from the Pienaar - Karino feeder which cannot provide firm support to the load required by new retail developments as well as constructed housing developments. It is therefore urgent to increase the capacity on the Pienaar and Karino Substations respectively. The customer base per feeder will be reduced and therefore improve the performance of the feeder. Spare capacity will be created which will ultimately lead to a more efficient network.

This Basic Assessment will provide information about the proposed Eskom 132/22kV substations and the 132kV overhead power line. The scope is restricted to this component of the project.

2 APPROACH TO THE BASIC ASSESSMENT PROCESS

The approach followed by the consultants is based on the specifications for the Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

The Department of Environmental Affairs, renamed in June 2019 to the Department of Environment, Forestry and Fisheries (DEFF), and renamed in April 2021 to the Department of Forestry, Fisheries and Environment (DFFE) is the lead authority for this Environmental Impact Assessment (EIA) process and the development needs to be authorised by this Department in accordance with the National Environmental Management Act 107 of 1998 (NEMA) (as amended).

To ensure that all requirements and processes in terms of the Acts are followed, the following tasks need to be conducted. The following has to be submitted to the DFFE:

- Application form for Authorisation

- Draft Basic Assessment Report
- Environmental Management Programme (EMPr)
- Final Basic Assessment Report

The environmental authority will review the Application and final Basic Assessment Report and the following decisions may be made:

- Grant authorisation of the activity
- Refuse the activity
- Request further information or investigations
- Refer the application to a scoping process where substantial additional investigations or assessments are required in order to make a decision.

3 PROJECT LOCALITY

The proposed project is located in Tekwane North, a town area to the north of the N4, east of the R538 and south of the towns Emoyeni, Nyamazneni and west of Msogwaba and Entokozweni. This area is in the City of Mbombela Municipality in the Mpumalanga Province. The project is proposed on the Farms Tekwane 573 JU, Portion 9; Nyamasaan 647 JU, R/E; Tekwane North, Erf 816 JU; Tekwane 573 JU, R/E; Tekwane 573 JU Portion 2; Tekwane 573 JU Portion 1. The proposed project is set out in the Location Map below. (Refer to Appendix A for Site Location maps.)

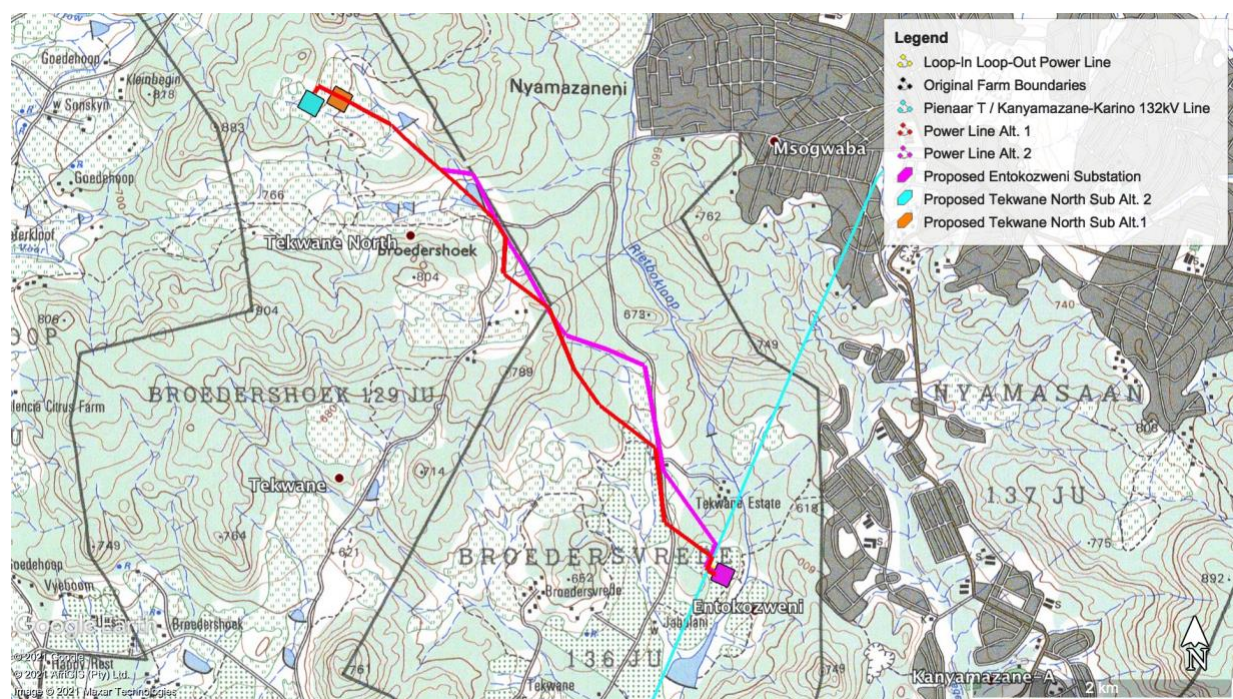


Figure 1: Site Location

Below are some of the main GPS coordinates for the project:

- Tekwane North Substation
 - Position Authorised in 2015: 25°24'39.19"S; 31° 6'58.78"E.
 - New proposed position (Alt. 1): 25°25'24.59"S; 31°07'42.87"E.
 - New position (Alt. 2): 25°25'26.25"S; 31°07'35.25"E.
- Entokozweni Substation: 25°27'26.41"S; 31° 9'30.74"E.

- Tekwane North Township: 25°25'57.36"S; 31° 8'1.78"E.
- Approximate centre of proposed powerline route: 25°26'21.49"S; 31° 8'43.47"E.
- Quarter Degree Square (QDS): 2531AC.
- Quaternary Drainage Area (QDA): X22K.

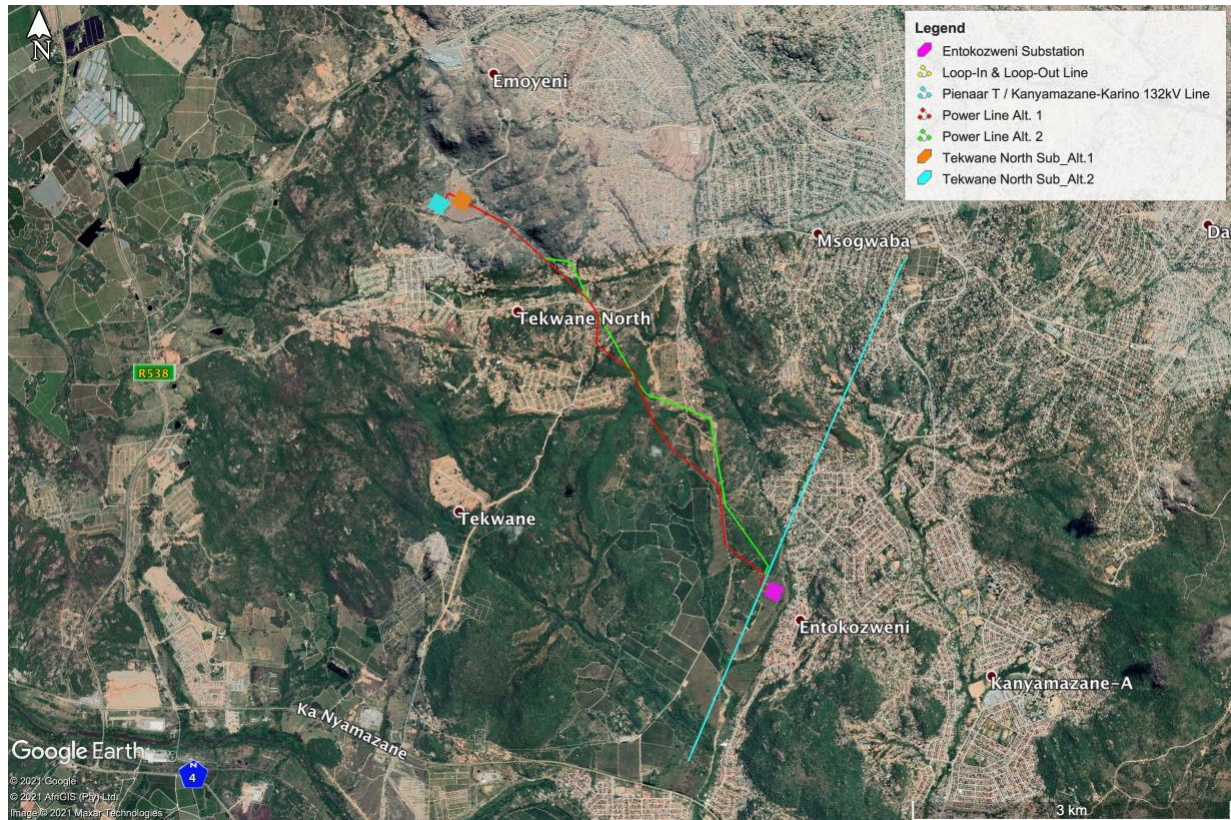


Figure 2: Site location (Google Earth)

4 PROPERTY DESCRIPTION

The proposed project is located on the Farms Tekwane 573 JU, Portion 9; Nyamasaan 647 JU, R/E; Tekwane North, Erf 816 JU; Tekwane 573 JU, R/E; Tekwane 573 JU Portion 2; Tekwane 573 JU Portion 1 in the City of Mbombela Municipality, Ehlanzeni District, Mpumalanga Province.

The Quarter Degree Square (QDS) is 2531AC. The study area is situated within the Primary Drainage Area (PDA) of X and the Quaternary Drainage Area (QDA) of X22K.

5 PROJECT DESCRIPTION

This environmental application is for the proposed construction of a ± 5 km 132kV chickadee power line and two Substations. The proposed construction of the project has been triggered by the rapid expansion of the geographic extent of Tekwane North, hence a need for Eskom to increase the capacity of electricity towards this area. Currently the area is being supplied with electricity from the Pienaar - Karino feeder which cannot provide firm support to the load required by new retail developments as well as constructed housing developments. It is therefore urgent to increase the capacity on the Pienaar and Karino Substations respectively. The customer base per feeder will be reduced and therefore improve the

performance of the feeder. Spare capacity will be created which will ultimately lead to a more efficient network.

The Application for Authorisation is for the construction of the following:

- Establish Entokozweni 132kV 2x20MVA substation. Size of site is 150m x 150m. (coordinate 25°27'26.41"S; 31° 9'30.74"E).
- Construct a 65m Loop-in to Entokozweni substation from the the Pienaar T/Karino-Kanyamazane overhead 132kV line (coordinate at T-off point 25°27'24.55"S; 31° 9'25.83"E)
- Construct a 65m Loop-out of Entokozweni substation to the Pienaar T/Karino-Kanyamazane overhead 132kV line (coordinate of T-off point 25°27'23.22"S; 31° 9'26.33"E)
- Establish Tekwane North 132kV 2x20MVA substation. Size of site is 150m x 150m. (coordinate 25°25'24.59"S; 31°07'42.87"E)
- Construct an approximately 5km (5 004m) overhead 132kV line from Entokozweni 132kV 2x20MVA substation to Tekwane North 132kV 2x20MVA substation.
- The total servitude width of the loop-in-loop-out is 73 metres and calculated as follows:
 - The outer edge of the servitude is 15,5 metres from the loop-in line.
 - The loop-in line is 21 metres from the Tekwane North – Entokozweni 132kV line
 - The loop-out line is 21 metres from Tekwane North – Entokozweni 132kV line
 - The outer edge of the servitude is 15,5 metres from the loop-out line

To date, viable route alignments have been identified and investigated. The preferred (Alternative 1) and alternative option (Alternative 2) were determined through the environmental and specialist studies, as well as by the limitations posed by existing activities in the project area.

The proposed project is set out in the Location Maps below.

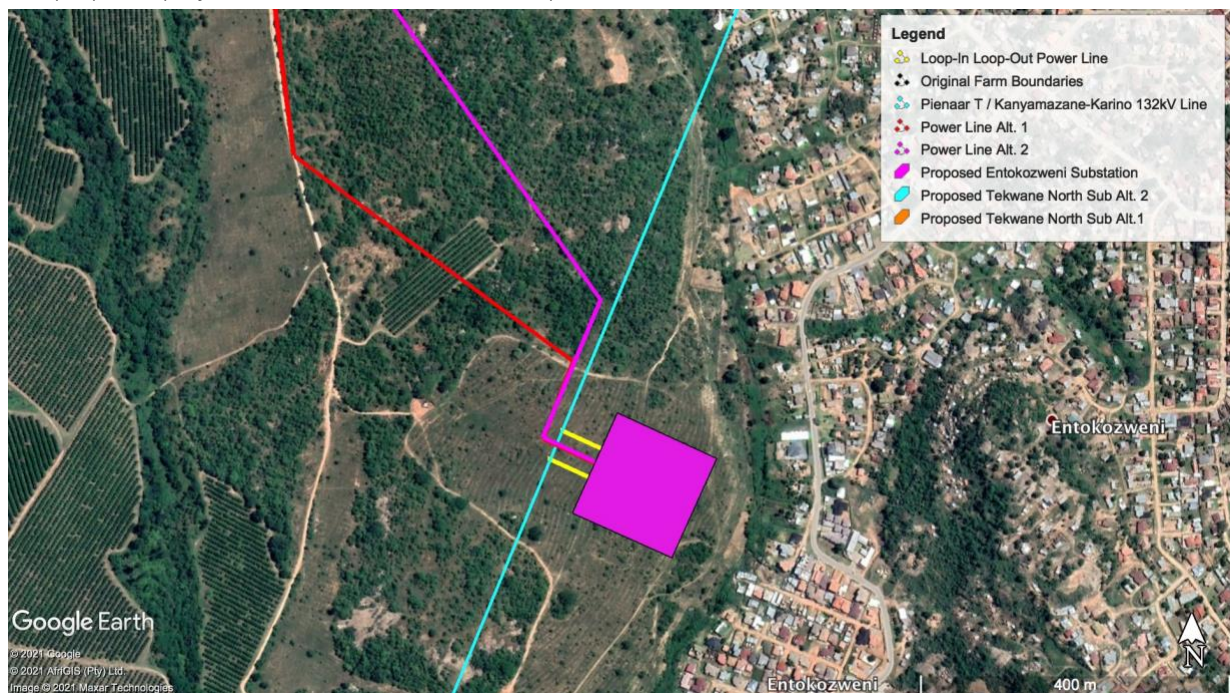


Figure 3: Proposed Entokozweni substation location

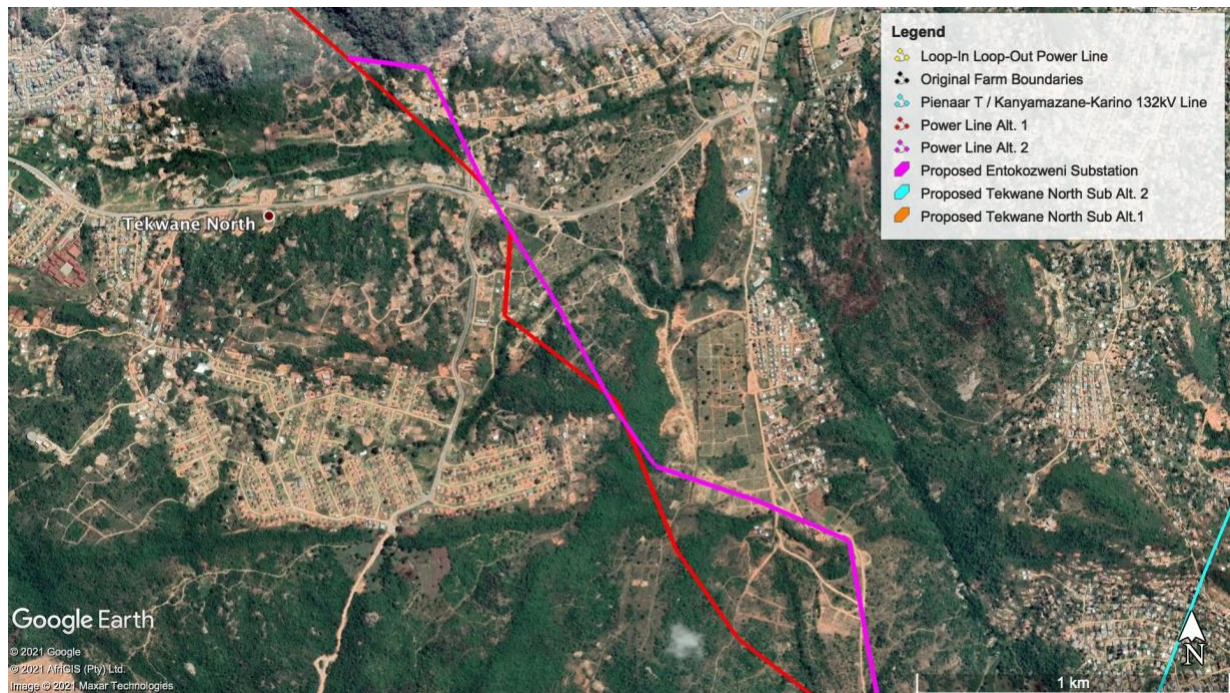


Figure 4: Middle Section of the Proposed route (in red)

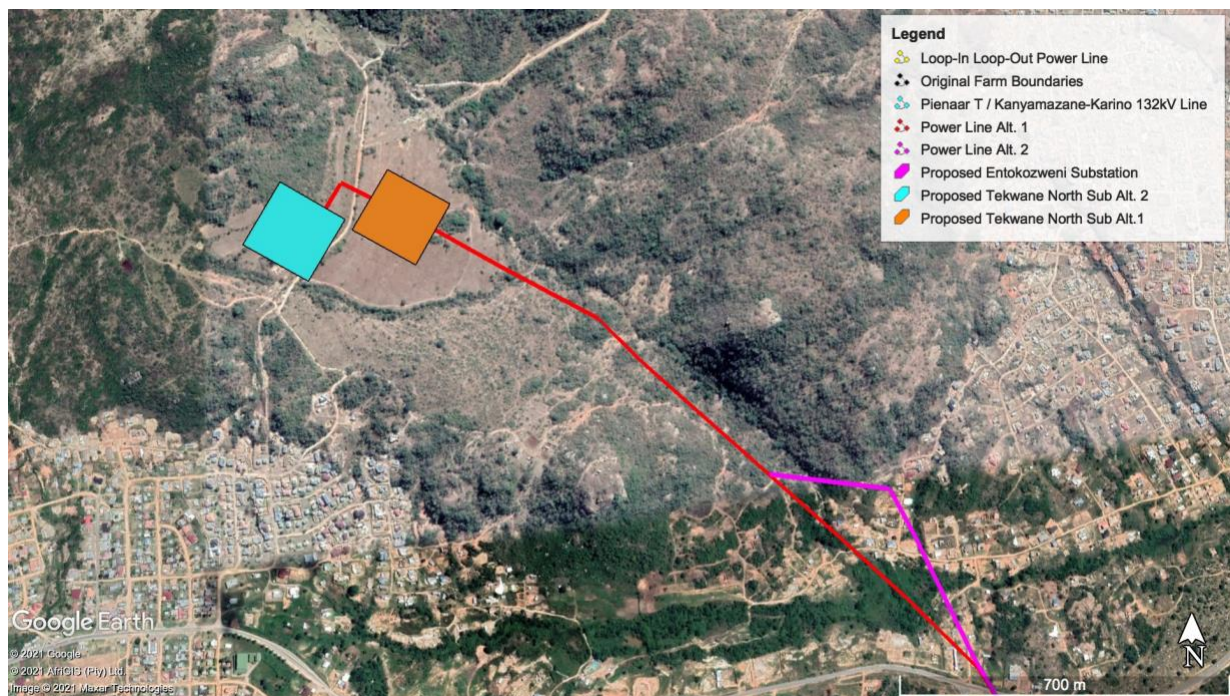


Figure 5: Proposed Tekwane North substation location

6 COORDINATES OF DEVELOPMENT PROPOSAL

The GPS coordinates of the Tekwane North – Entokozweni 132kV power line routes are as follows:

- Tekwane North – Entokozweni 132kV line (Alternative 1):
 - Length: 5,004 km.
 - Starting Point at Entokozweni substation: 25°27'26.41"S; 31° 9'30.74"E.
 - Middle Point: 25°26'21.49"S; 31° 8'43.47"E.
 - End Point at Tekwane North Substation site: 25°25'24.59"S; 31°07'42.87"E.
- Tekwane North – Entokozweni 132kV line (Alternative 2):
 - Length: 5, 277 km.
 - Starting Point at Entokozweni substation: 25°27'26.41"S; 31° 9'30.74"E.
 - Middle Point: 25°26'18.23"S; 31° 8'42.00"E
 - End Point at Tekwane North Substation site: 25°25'24.59"S; 31°07'42.87"E.

Table 1: GPS Coordinates along Tekwane North – Entokozweni 132kV power lines - every 250m

POWER LINE ALTERNATIVE 1	
0m (At Entokozweni substation)	25°27'26.41"S; 31°09'30.74"E
250m	25°27'19.19"S; 31° 9'25.50"E
500m	25°27'14.36"S; 31° 9'18.29"E
750m	25°27'8.40"S; 31° 9'13.23"E
1000m	25°27'0.36"S; 31° 9'12.17"E
1250m	25°26'52.34"S; 31° 9'11.04"E
1500m	25°26'47.36"S; 31° 9'3.92"E
1750m	25°26'42.46"S; 31° 8'56.80"E
2000m	25°26'36.13"S; 31° 8'51.24"E
2250m	25°26'29.11"S; 31° 8'46.84"E
2500m	25°26'21.55"S; 31° 8'43.54"E
2750m	25°26'15.19"S; 31° 8'38.72"E
3000m	25°26'10.29"S; 31° 8'31.57"E
3250m	25°26'3.46"S; 31° 8'28.99"E
3500m	25°25'55.99"S; 31° 8'27.02"E
3750m	25°25'50.01"S; 31° 8'20.88"E
4000m	25°25'44.61"S; 31° 8'14.25"E
4250m	25°25'39.24"S; 31° 8'7.44"E
4500m	25°25'33.98"S; 31° 8'0.76"E
4750m	25°25'29.29"S; 31° 7'53.63"E
5000m	25°25'25.46"S; 31° 7'45.77"E
5 004 m (At Tekwane North substation Alt. 1)	25°25'24.59"S; 31°07'42.87"E.
POWER LINE ALTERNATIVE 2	
0m (At Entokozweni substation)	25°27'26.41"S; 31°09'30.74"E
250m	25°27'18.52"S; 31° 9'27.96"E
500m	25°27'11.80"S; 31° 9'23.91"E
750m	25°27'5.22"S; 31° 9'18.77"E
1000m	25°26'58.60"S; 31° 9'13.53"E
1250m	25°26'50.61"S; 31° 9'11.91"E
1500m	25°26'42.71"S; 31° 9'10.35"E
1750m	25°26'34.63"S; 31° 9'8.75"E
2000m	25°26'29.51"S; 31° 9'3.30"E
2250m	25°26'26.51"S; 31° 8'54.92"E
2500m	25°26'23.90"S; 31° 8'46.32"E
2750m	25°26'17.52"S; 31° 8'41.07"E
3000m	25°26'10.41"S; 31° 8'36.66"E

3250m	25°26'3.37"S; 31° 8'32.10"E
3500m	25°25'56.50"S; 31° 8'27.41"E
3750m	25°25'49.30"S; 31° 8'23.34"E
4000m	25°25'42.63"S; 31° 8'18.89"E
4250m	25°25'41.34"S; 31° 8'10.21"E
4500m	25°25'36.05"S; 31° 8'3.50"E
4750m	25°25'30.83"S; 31° 7'56.72"E
5000m	25°25'27.06"S; 31° 7'48.82"E
5 104m (At Tekwane North substation Alt. 1)	25°25'24.59"S; 31°07'42.87"E.

GPS Coordinates along the loop-in-loop-out to Entokozweni substation

Table 2: GPS Coordinates along the loop-in-loop-out to Entokozweni substation from the Pienaar T/Karino-Kanyamazane overhead 132kV line

POWER LINE LOOP IN	
0m (At T-off from Pienaar T/Karino-Kanyamazane)	25°27'24.55"S; 31° 9'25.83"E
65m (At Entokozweni substation)	25°27'25.38"S; 31° 9'27.83"E
POWER LINE LOOP OUT	
0m (At Entokozweni substation)	25°27'24.11"S; 31° 9'28.44"E
65m (At T-off from Pienaar T/Karino-Kanyamazane)	25°27'23.22"S; 31° 9'26.33"E

The GPS coordinates of the substation positions are as follows:

Table 3: The Entokozweni 132kV 2x20MVA substation

Centre Points	Alternative 1	Alternative 2 (none)
Entokozweni substation	25°27'26.41"S; 31° 9'30.74"E	N/A

Table 4: The Tekwane North 132kV 2x20MVA substation

Centre Points	Alternative 1	Alternative 2
Tekwane North Substation	25°25'24.59"S; 31°07'42.87"E	25°25'26.25"S; 31°07'35.25"E

7 PHYSICAL SIZE OF THE ACTIVITY

The physical size of the preferred and alternative activity/ (footprint):

Table 5: The Tekwane North – Entokozweni 132kV power lines

Alternative:	Length of the activity:
Alternative 1 (Proposal)	5004m
Alternative 2	5277m

Table 6: The loop-in-loop-out to Entokozweni substation from the the Pienaar T/Karino-Kanyamazane overhead 132kV line

Alternative:	Length of the activity:
Loop-in Power line	65m

Loop-out Power line	65m
---------------------	-----

Table 7: The Entokozweni 132kV 2x20MVA substation

Alternative:	Size of the activity:
Alternative 1 (Proposal)	150m x 150m = 22 500 m ² (2,25 hectares)

Table 8: The Tekwane North 132kV 2x20MVA substation

Alternative:	Size of the activity:
Alternative 1 (Proposal)	150m x 150m = 22 500 m ² (2,25 hectares)
Alternative 2	150m X 150m = 22 500 m ² (2,25 hectares)

The size of the alternative servitudes (within which the above footprints will occur):

Table 9: The Tekwane North – Entokozweni 132kV power lines

Alternative:	Size of the site/servitude:
Alternative 1 (Proposal)	31m servitude x 5004m = 155 124m ²
Alternative 2	31m servitude x 5277m = 163 587m ²

Table 10: The loop-in-loop-out to Entokozweni substation from the the Pienaar T/Karino-Kanyamazane overhead 132kV line

Alternative:	Size of the site/servitude:
Alternative 1 (Proposal)	73m servitude x 65m = 4 745m ²

The EIA will seek to authorise a corridor for the power line, and not just for the actual width of the power line servitude. The wider corridor of 200m that was investigated will allow for potential amendments to the Environmental Authorisation (should it be required at a later stage).

8 ACCESS TO THE SITE

No new access to the site is planned. During construction all vehicle movement must be along existing roads. The servitude area of the new power lines will also be used to gain access during construction. A temporary construction road will be cleared in the new servitude area underneath the future power lines to enable the construction activities. An area of 8m will be cleared of major trees and bushes, 4m on either side of the proposed alignment of the line. As mentioned the existing servitudes and existing roads should be used during construction. Therefore road alternatives are not being investigated for this project. Access to both the proposed substation sites is already existing.

9 TOPOGRAPHY

The topography of the study area is mountainous and hilly terrain, with narrow and broad valley and ravines. Large flat open plains are rare with some flat areas present on hilltops, ridge tops or plateaus. The average height above sea level (elevation) across the study site is about 691m, while the maximum and minimum elevations are about 830m and 550m, respectively. The gradient of the study site varies considerably across the length of the study site (proposed power line route of 6km). The Tekwane North Substation (in the north of the study site) is at an elevation of about 825m, while the Entokozweni Substation (in the south of the study site) is at an elevation of about 550m. The overall, general downward slope is from north to south.

10 GRADIENT OF THE SITE

Table 11: Gradient

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
------	-------------	-------------	-------------	--------------	-------------	------------------

Note: The average slope / gradient across the entire project is: **1:15 – 1:10**.

There are a few places where the slope is 1:4 (Steeper than 1:5)

11 LOCATION IN LANDSCAPE

The landform(s) that best describes the site.

Table 12: Landform

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
-----------	---------	--------------------------	--------	-------	----------------------------	-------------

12 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site located on any of the following?

Table 13: Site stability

Shallow water table (less than 1.5m deep)	YES	NO X
Dolomite, sinkhole or doline (sinkhole) areas	YES	NO X
Seasonally wet soils (often close to water bodies)	YES	NO X
Unstable rocky slopes or steep slopes with loose soil	YES	NO X
Dispersive soils (soils that dissolve in water)	YES	NO X
Soils with high clay content (clay fraction more than 40%)	YES	NO X
Any other unstable soil or geological feature	YES	NO X
An area sensitive to erosion	YES	NO X

13 GROUNDCOVER

The types of groundcover present on the site and the estimated percentage found on site

Table 14: Groundcover

Natural veld - good condition % = 0	Natural veld with scattered aliens % = 50	Natural veld with heavy alien infestation % = 15	Veld dominated by alien species % = 0	Landscaped (vegetation) % = 0
Sport field % = 0	Cultivated land % = 5	Paved surface (Hard landscaping) % = 0	Building or other structure % = 30	Bare soil % = 0

14 LAND USE CHARACTER OF SURROUNDING AREA

The landcover or landuse of the region is a mix of high-density urban areas; cultivated farmlands; and open to semi-open bushveld and mountainous areas. The dominant landuse of the study area and surrounding areas are high-density, urban townships, along with associated infrastructure such as roads,

graveyards, etc. Other significant landcover and landuses within the study area include citrus farmlands, and open, bushveld covered granite koppies and rocky hills.

Table 15: Current land use

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant ^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Small Holdings	
Other land uses (describe):				

The block below represents the position of the current land uses, using the associated number from the table above. The position of the land-uses represent a 500m radius around the site. Each block represents an area of 250m X 250m.

NORTH						
WEST	1	1	1	1,9	1,9	EAST
	1,7	1,9	1,5,9	1,9	1,9	
	1,7	1,5,9		1,9,22	1,9	
	1,7	1,2,5,9	1,2,9	1,2,9,22	1,9	
	1	1	1,9	1,9	1,9	
SOUTH						

15 SOCIO-ECONOMIC ASPECTS

The City of Mbombela Local Municipality is a Category B municipality situated in the Mpumalanga Province and forms part of the Ehlanzeni District. It is one of the four municipalities in the district, making up almost a third of its geographical area. It was established by the amalgamation of the Mbombela and Umjindi Local Municipalities in August 2016.

Mbombela (previously Nelspruit) is the capital of the province. Mbombela is the Siswati word for 'a lot of people together in a small space'. The city serves as a gateway to some of the best eco- and adventure activities in Southern Africa and, with its moderate climate, becomes the preferred tourist destination all year round. Its subtropical fruits (like mangoes, avocados, oranges, lemons, litchis and bananas) are a

huge drawcard for visitors, and during springtime the blossoms of orange trees can be smelt kilometres away.

Area

7 141km²

Cities/Towns

Barberton, Emoyeni, Entokozweni, Hazyview, Kaapschehoop, Kabokweni, Kanyamazane, Luphisi, Matsulu, Mbombela, Mpakeni, Msogwaba, Ngodwana, Skukuza, Tekwane, White River.

Major economic activities and sources of employment

Finance and business services, manufacturing, government services, community services, trade, transport and communications, agriculture, construction, mining and tourism.

2019 – 2020 IDP City of Mbombela

According to the 2019 – 2020 IDP review of the City of Mbombela the following pertains to the Municipality:

Community Survey 2016 results based on the 2016 municipal boundaries indicate that the Mbombela municipal area had a total population of 695 913. This population constitutes 39.6% of the entire population of Ehlanzeni District. Hence, the municipal area of Mbombela is the most populous within the Ehlanzeni District (Community Survey, 2016). With regards to the municipal area's population City of Mbombela - IDP Review 2019-2020 115 trends over the past 15 years, the Municipality has been one of the fastest growing municipalities in the district. Unemployment within the Mbombela municipal area has declined by 3.2% between 2011 and 2017. The unemployment rate (strict definition) thus stood at 24.8% during 2017 from 28.0% in 2011. It can also be observed that females were the most affected by unemployment within the municipal area with 27.1% of unemployed females whilst male unemployment rate stood at 22.7%.

16 NEED FOR THE PROJECT

In 2012, the Government adopted the National Infrastructure Plan, wherein it highlighted that South Africa would be embarking on a process to accelerate infrastructure development, in order to deal with service delivery backlogs and to build a platform for future economic growth and employment. This infrastructure growth would be spearheaded by Strategic Infrastructure Projects (SIPs), which are large-scale infrastructure projects that were also projected to have numerous environmental impacts, which in turn could trigger many EIAs. SIP 10 states that: Electricity Transmission and Distribution for all, has been identified as a major infrastructure development need by the Presidential Infrastructure Coordinating Committee (PICC). This project is therefore in line with the above-mentioned SIP.

The proposed activity will provide support to electrical infrastructure that will contribute to sustainable economic growth, provide for sustainable human settlements.

Eskom Holdings SOC Ltd is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Eskom's core business is in the generation, transmission (transport), trading and retail of electricity. The reliable provision of electricity by Eskom is critical for industrial development and related employment and sustainable development in South Africa. As electricity cannot practically be stored on a significant scale, power is generated and delivered over long distances at the instant that it is required. In South Africa, thousands of kilometres of high voltage Transmission lines (i.e.

765kV, 400kV and 275kV Transmission lines) transmit this power to Eskom's major substations. At these major substations, the voltage is down-rated and distributed to smaller substations all over the country via Distribution lines (e.g. 132kV, 88kV and 66kV power lines). Here the voltage is down-rated further for distribution to industry, business, farms and homes. In order to maintain a reliable power supply within the entire network, the voltages at all substations are required to be within certain desired limits. If the network is operated at voltages which are below these limits, voltage collapse problems and power outages may be experienced.

The activity will ensure that the electrical needs of the province, as stated in the Provincial Spatial Development Framework (PSDF), are satisfied. This project is initiated by Eskom to ensure continuous reliable supply for the Tekwane North Area. The PSDF highlights the need of electricity upgrade in the area/ward where Tekwane North is situated.

Below is core issues related to electricity in the City of Mbombela Municipality.

Demand for engineering infrastructure within the Mbombela Municipality:

- The electricity demand for 33522 houses is approximately 36 874 mWh/month.
- An additional 10 581 mWh/month will be required in 2015.
- A total of 80 656 mWh/month will be required in year 2035, if no additional electricity is provided between 2010 and 2035.

It is also highlighted in the Mbombela Spatial Development Framework that there is an increasing need for the providing and upgrading of engineering infrastructures within the Municipality.

Mbombela faces the following spatial challenges as a result of continued population growth, mainly due to illegal immigration:

- Continued urban sprawl, especially in the eastern Nsikazi areas.
- Increased need for engineering and social infrastructure including electricity, water, sanitation, roads, community and recreational facilities.
- Pressure on land for residential purposes and the competition with subsistence or commercial agricultural activities.
- Increased pressure for burial facilities.
- Continued influx of illegal immigrants has a remarkable impact on the figures and composition of the population of Mbombela and the resultant mushrooming of informal settlements increases pressure on the provision of housing and social services.
- Mbombela's youth needs to be catered for in terms of skills development

The municipality has prioritised infrastructure projects as informed by the vision, objectives and strategies and resources available. In adhering to the principle of intergovernmental and integrated planning, the municipality will include projects from the sector departments and other parastatals such as Eskom. The municipality is also in the process of developing and reviewing the key sector plans that will assist in achieving the constitutional obligations. The sector plans amongst others include the Long term strategic plan (Vision 2030), Spatial Development Framework, Local Economic Development Strategy, Integrated Waste Management Plan, Comprehensive Infrastructure Plan and Disaster Management.

17 LEGAL REQUIREMENTS

1 APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

The National Environmental Management Act (Act No. 107 of 1998) and the Environmental Impact Assessment (EIA) Regulations, of 2017

An application for authorisation of the project is submitted to the National Department of Forestry, Fisheries and Environment (DFFE), in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and the Environmental Impact Assessment (EIA) Regulations of 2017.

The proposed project is a listed activity in terms of Sections 24(2) and 24(d) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) (as amended). The Environmental Impact Assessment (EIA) Regulations, 2017 promulgated in terms of Chapter 5 of the NEMA provide for the control of certain activities that are listed in Government Notice Regulation (GN R.) No. 327, 325 and 324. Activities listed in these notices must comply with the regulatory requirements listed in GN R. 326, which prohibits such activities until written Authorisation is obtained from the Competent Authority. Such Environmental Authorisation (EA), which may be granted subject to conditions, will only be considered once there has been compliance with the EIA Regulations of 2017. GN R. No. 326 sets out the procedure and documentation that need to be compiled with undertaking a Basic Assessment Process.

National Water Act (Act No. 36 of 1998)

No application required to be submitted to the Department of Water and Sanitation (DWS), for a water use authorisation in terms of the General Notice 509, Government Gazette 40229, dated 26 August 2016, "General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) (NWA)".

National Heritage Resources Act (Act No. 25 of 1999)

In addition to the above, A Phase I Heritage Impact Assessment (HIA) study is generally required in terms of Section 38 of the National Heritage Resources Act (No 25 of 1999) to establish whether any of the types and ranges of heritage resources ('national estate') as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) do occur on the property and, if so to determine the significance of these heritage resources, and to make recommendations regarding the mitigation and management of significant heritage resources that may be affected.

National Forests Act (Act No. 84 of 1998)

The project might involve the cutting, disturbing, damaging or destroying of protected trees declared in terms of section 12 of the National Forest Act (NFA) (Act 84 of 1998), as amended. A licence in terms of section 15 of the NFA will be required should the proposed Route Alternative 1 be constructed.

National Veld and Forest Fire Act (Act No. 101 of 1998)

The applicant should provide fire breaks in accordance with Chapter 4 of the National Veld and Forest Fire Act (Act 101 of 1998) and should consider amongst other the following:

- Fire rating
- Consultation of adjoining owners and the fire protection association (if any)
- be present at such burning or have an agent attend.

The fire break should be:

- wide and long enough to prevent to have a reasonable chance of preventing a veldfire from spreading to or from neighbouring land;

- it does not cause soil erosion; and is reasonably free of inflammable material capable of carrying a veldfire across it.

Permitting and License Requirements

The following permitting and or license requirements are applicable to the proposed project:

Protected Tree Removal – Section 15 of National Forests Act (Act No. 84 of 1998)

There are three protected tree species in the study area (*Breonadia salicina*, *Pterocarpus angolensis* (*Kiaat*) and *Sclerocarya birrea* (*Marula*)). It is fairly likely that some of these trees will need to be removed / destroyed. No protected trees were observed in the actual area of the proposed substations.

Should Power line Alternative 1 be constructed then the project will involve the cutting, disturbing, damaging or destroying of protected trees declared in terms of section 12 of the NFA, therefore a licence in terms of section 15 of the NFA will be required.

2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

In the South African legislative framework, the National Environmental Management Act No. 107 of 1998, as amended (NEMA) regulates development activities, which may pose a risk to the integrity of the ecological and human environment. Coupled with NEMA, listed activities are provided, which describe the types, limits, expanse and nature of developments that require a Basic Environmental Assessment Process, in application for Environmental Authorisation prior to commencement.

The following construction activities will require Environmental Authorisation:

2.1 The listed activities for the proposed project are the following

Table 16: Listed Activities

Listed Activity	Activity/Project Description
<p><u>GN R. 327/2017</u> <u>Listing Notice 1 Activity 11</u> The <u>development of facilities or infrastructure</u> for the transmission and <u>distribution of electricity</u>—</p> <p>(i) <u>outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts</u>; or</p> <p>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;</p> <p>excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</p> <p>(a) temporarily required to allow for maintenance of existing infrastructure;</p> <p>(b) 2 kilometres or shorter in length;</p> <p>(c) within an existing transmission line servitude; and</p> <p>(d) will be removed within 18 months of the commencement of development.</p>	<p>The 132kV overhead distribution Entokozweni – Tekwane North power line will be constructed over approximately 5 km, outside an urban area, from the proposed Entokozweni substation to the proposed Tekwane North Substation.</p>
<p><u>GN R. 327/2017</u> <u>Listing Notice 1 Activity 12</u> (Not relevant) The development of—</p>	<p>(Not relevant) The proposed site of 22 500 square metres for the Entokozweni substation is not within 32 metres from a watercourse. The distance from the north eastern corner to</p>

<p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or</p> <p>(ii) <u>infrastructure or structures with a physical footprint of 100 square metres or more;</u></p> <p>where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback exists, <u>within 32 metres of a watercourse,</u> measured from the edge of a watercourse; —</p> <p>excluding—</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies;</p> <p>(cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies;</p> <p>(dd) where such development occurs within an urban area;</p> <p>(ee) where such development occurs within existing roads, road reserves or railway line reserves; or</p> <p>(ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.</p>	<p>the edge of the Rietbokloop watercourse, is approximately 41 meters.</p> <p>In addition, the site (22 500 square metres) for the Tekwane North substation is not within 32 metres of a watercourse. The eastern corner of the site is approximately 41,5 meters from the edge of a drainage line.</p>
<p><u>GN R. 327/2017</u> <u>Listing Notice 1 Activity 19</u></p> <p>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;</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving—</p> <p>(a) will occur behind a development setback;</p> <p>(b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p> <p>(c) falls within the ambit of activity 21 in this Notice, in which case that activity applies;</p> <p>(d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or</p> <p>where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.</p>	<p>There are various small seasonal / ephemeral drainage lines and small, seasonal and ephemeral streams along the Entokozweni – Tekwane North 132kV feeder line to the proposed Tekwane North Substation. The project should have no impact on these as the line should be designed to jump these watercourses. It might however be impossible to completely avoid all the drainage lines and streams along the feeder line to the proposed Tekwane North Substation. The construction of the power line structures/ pylons might impact of a few. This will result in excavation and infilling of more than 10 cubic metres to plant the pylon.</p>
<p><u>GN R. 327/2017</u> <u>Listing Notice 1 Activity 27</u></p> <p>The <u>clearance of an area of 1 hectares or more,</u> but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>Two sites of 2,25 hectares each (site size 150m X 150m) will be cleared of vegetation for the two substations, Entokozweni and Tekwane North. The total impacted area for substations is 4,5 ha.</p>

<p><u>GN R. 324/2017</u> <u>Listing Notice 3 Activity 12</u> 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</p> <p>f. <u>Mpumalanga</u></p> <p>i) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>ii) Within <u>critical biodiversity areas</u> identified in bioregional plans; or</p> <p>iii) On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.</p>	<p><u>In Mpumalanga:</u> More than 300 square metres of indigenous vegetation will be cleared to construct the substation. The Entokozweni Substation site, with a physical footprint of 22 500 square metres, in the south of the study site is within an ecological support area (ESA).</p>
<p><u>GN R. 324/2017</u> <u>Listing Notice 3 Activity 14</u> <u>(Not relevant)</u> The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) <u>infrastructure or structures with a physical footprint of 10 square metres or more;</u> where such development occurs—</p> <p>(a) within a watercourse;</p> <p>(b) in front of a development setback; or</p> <p>(c) <u>if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</u> excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p> <p>f. <u>Mpumalanga</u></p> <p>i. Outside urban areas:</p> <p>(aa) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(bb) National Protected Area Expansion Strategy Focus areas;</p> <p>(cc) World Heritage Sites;</p> <p>(dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(ee) Sites or areas identified in terms of an international convention;</p> <p>(ff) <u>Critical biodiversity areas</u> or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</p> <p>(gg) Core areas in biosphere reserves; or</p> <p>(hh) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other</p>	<p><u>(Not relevant)</u> The Entokozweni Substation site, with a physical footprint of 22 500 square metres, is not within 32 metres of a watercourse. The distance from the north eastern corner to the edge of the Rietbokloop watercourse, is approximately 41 metres. The proposed substation site, is however within an ecological support area (ESA).</p>

<p>protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation; or</p> <p>ii. Inside urban areas:</p> <p>(aa) Areas zoned for use as public open space; or</p> <p>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, zoned for a conservation purpose.</p>	
---	--

2.2 The Description of Listed activities associated with the Project activities

1 Listing Notice 1 Activity 11: Construct a 132kV overhead power line outside an urban area

132kV Design specifications

It is proposed to construct the 132kV overhead distribution Entokozweni – Tekwane North power line over approximately 5 km, outside an urban area, from the proposed Entokozweni substation to the proposed Tekwane North Substation.

In addition, a 65m Loop-in will be constructed to Entokozweni substation from the Pienaar T/Karino-Kanyamazane overhead 132kV line and a 65m Loop-out of Entokozweni substation to the Pienaar T/Karino-Kanyamazane overhead 132kV line.

The proposed structure for the 132kV overhead power lines, is a monopole steel structure. In general, these structures could be placed 220-350 metres apart, over the length of a power line. The structures for a power line are between 14 and 30 metres high, depending on the terrain and existing land use. The flatter the terrain, the shorter the structures as well as the distance between the structures needs to be. The conductor attachment height on a pole is typically about 13m (for 20m intermediate poles) and more for longer poles, depending on the pole length. Ground clearances will adhere to the requirements of the Occupational Health and Safety Act (Act No. 58 of 1993) of 6.3m and 7.5m.

Strain poles have an average planting depth of 2m while intermediate pole planting depths vary between 2.6m (for 20m poles) and 3m (for 24m poles) or more depending on the pole length. The pole foundation is dependant on the soil type and varies in size and consists of a 8:1 good soil:cement mix that are compacted in 200mm layers. A concrete cap of 1.2m x 1.2m is cast around the pole to "seal" the soil around the pole from oxygen - to control oxidation or rust on the pole and to prevent erosion damage to the foundations.

Should the structures be 21m high above ground then the planting depth of the structure could be calculated as follows: For a structure that need to be 21m above ground, the planting depth will be 0.6 metres plus 10% of the height of the structure above ground = 0.6 metres plus 2.1 metres = structure is planted 2.7 metres deep. Should stays be needed then the stays will be at a 45° angle to the structure and planted 21 metres from the structure into the ground.

Where the site is relatively flat, single structures without stays will be used, except for where the power line has to change direction. Refer to Appendix C in the BAR for visuals of the monopole steel structure.

Servitude requirements

The total servitude width of the loop-in-loop-out, to Entokozweni substation from the Pienaar T/Karino-Kanyamazane overhead 132kV line, is 73 metres and calculated as follows:

- The outer edge of the servitude is 15,5 metres from the loop-in line.

- The loop-in line is 21 metres from the Tekwane North – Entokozweni 132kV line
- The loop-out line is 21 metres from Tekwane North – Entokozweni 132kV line
- The outer edge of the servitude is 15,5 metres from the loop-out line

The Tekwane North – Entokozweni 132kV line requires a servitude width of 31 metres (15,5 metres on either side of the centre line of the power line). A servitude area is a no building area, except for Eskom structures.

- 2 Listing Notice 1 Activity 19 - Infilling or excavation of more than 10 cubic metres into/from a watercourse

There are no large rivers or streams in the study area. However, there are a few small drainage lines and small seasonal streams. The project should have no impact on these as the line should be designed to jump these watercourses. It might however be impossible to completely avoid all the various small seasonal / ephemeral drainage lines and small, seasonal and ephemeral streams along the Entokozweni – Tekwane North 132kV feeder line to the proposed Tekwane North Substation. The construction of the power line structures/ pylons might impact of a few. This will result in excavation and infilling of more than 10 cubic metres to plant the pylon.

- 3 Listing Notice 1 Activity 27: The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation

A site of 2,25 hectares (150m X 150m) will be cleared for each of the two proposed substations. The combined area to be cleared is 22 500m² (Tekwane North substation) plus 22 500m² (Entokozweni substation) equals 45 000m² (4,5 hectares). The clearance of the vegetation underneath the power line alignment is not a listed activity, being a linear activity. An area of 8m will be cleared of major trees and bushes, 4m on either side of the proposed alignment of the power line.

- 4 Listing Notice 3 Activity 12: The clearance of an area of 300 square metres or more of indigenous vegetation within Ecological Support Areas identified in the Mpumalanga Biodiversity Sector Plan

According to the latest Mpumalanga Biodiversity Sector Plan (2014) the study site is not within a Critical Biodiversity Area (CBA). The site of the proposed Entokozweni Substation is on the edge of an Ecological Support Area (ESA). This ESA is an Aquatic ESA that runs along (and including) the Rietbokloop (stream) and the entire valley, which is mostly transformed and built-up. More than 300 m² of vegetation will be cleared in this ESA for the site of the Entokozweni substation. The area to be cleared is 22 500m². The rest of the study area is not within a demarcated ESA.

18 FEASIBLE AND REASONABLE ALTERNATIVES

During investigations alternatives within the larger study area were investigated. The best options were determined through the environmental and specialist studies, as well as the limitations inherent to the project area, and the technical requirements for electrical infrastructure. Comment from Interested and Affected Parties were also synthesised to identify options.

The following alternatives have been identified and are described as follows:

1 POWER LINE ROUTE ALTERNATIVES

Route alternatives were assessed and a preferred alternative identified. The routes investigated are suitable for the proposed project as it is not situated within any priority areas. Priority areas include formal and informal protected areas (PA) (nature reserves); important bird areas (IBAs); RAMSAR sites; National fresh water ecosystem priority areas (NFEPA) and National protected areas expansion strategy (NPAES) areas.

According to the latest Mpumalanga Biodiversity Sector Plan (2014) the study site is not within a Critical Biodiversity Area (CBA). The site of the proposed Entokozweni Substation is on the edge of an Ecological Support Area (ESA). This ESA is an Aquatic ESA that runs along (and including) the Rietbokloop (stream) and the entire valley, which is mostly transformed and built-up. The rest of the study area is not within a demarcated ESA.

No high sensitive areas or 'No-Go' zones were identified during field investigations. All available information and data sets are taken into account when determining the sensitivity of the study site, including CBAs, ESAs, priority areas, ideal habitats for priority species (fauna and flora), watercourses, ridges, koppies (rocky outcrops), presence of RDL and ODL species, threat status of the veldtype in which the study site is situated, etc.

Route alternative recommendations: Ecological

Two power line route / servitude alternatives were investigated. Due to the spatial constraints for the servitude the alternatives follow the same corridor in certain areas. The ecological impacts of the two alternatives in the northern half of the routes are similar. However, in the southern half, Alternative 2 runs directly over the top of a rocky outcrop where Alternative 1 skirts it. There is also a second rocky outcrop / rocky hill that Alternative 2 would have greater impact on. Therefore, although the impacts are similar, those of Alternative 2 are still slightly higher and each impact, however slight, still results in an increase in the cumulative negative impacts. For these reasons the recommended route alternative is Alternative 1.

Table17: Potential ecological impacts by power line alternatives

Ecological Sensitive Aspect	Sub Alt. 1	Sub Alt. 2
Areas of high ecological sensitivity	1 (ridge)	1 (ridge)
No-Go areas in close proximity	0	0
No. of river / stream crossings	2	2
Drainage lines	2	2
Rocky outcrops	1	2
Ridges	2	2
Wetlands	0	0
No of potential impacts	9	10

Route alternative recommendations: Avifauna

The final risk rating for an alignment was calculated as the sum of the risk scores of the individual factors:

Table 18: Sensitivity analysis ratings (Score)

Factors	Alternative 1	Alternative 2
Risk-creating factors		
Wetlands & dams	0,00	0,00
Number of rivers & streams	9,00	9,00
Number of drainage lines	6,00	6,00
Grassland	0,00	0,00
Risk-reducing factors		
Cultivated lands	-1000,00	-1000,00
Existing TX lines	0,00	0,00
Roads	-1600,00	-1000,00
Suburban/industrial	-5695,00	-4500,00
TOTAL	-8280,00	-6485,00

The final rating, or score, shows that Route Alternative 1 (Preferred Option) has a better rating due to the lower total (Table). In other words, in terms of the rating criteria used, Route Alternative 1 is less sensitive in terms of Avifaunal Impacts.

The two power line route alternatives are very similar in most aspects, but Alternative 2 does traverse more hilltops and rocky bushveld areas, especially in the southern half of the route. In this area Alternative 1 runs further distances along and parallel to existing roads. Erecting a power line along an existing road lowers the potential for bird impacts and collisions than the same line in open grassland or bushveld. The road is also already a disturbance within the natural environment and it is always preferable to keep disturbances within the same area. For these reasons the recommended route alternative is Alternative 1.

Route alternative recommendations: Heritage

Alternative 1 is an alignment sited in the field during the current site visit conducted by HCAC to avoid heritage sensitive areas, mostly being large cemeteries. Alternative 2 has heritage sensitive areas, inter alia cemeteries, an Iron Age site and a homestead. Four heritage features were recorded consisting of cemeteries that are rapidly expanding. A single find spot was recorded indicating use of the wider landscape by Stone Age people and Iron Age communities. Alternative 1 (indicated in blue on the table below) does not impact on any known heritage resources and is therefore the preferred alternative, as Alternative 2 (indicated in green) traverses several cemeteries.

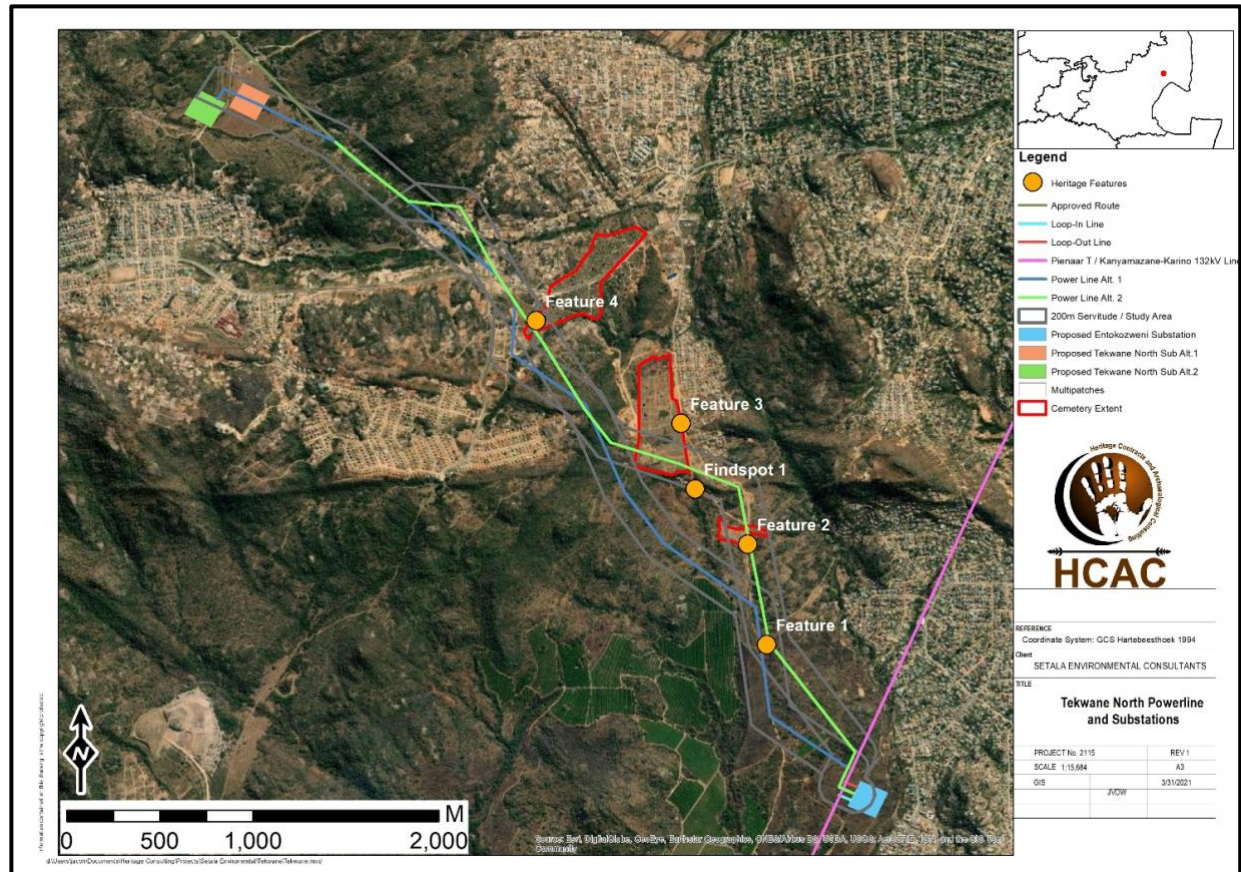


Figure 6: Heritage Resources

In summary, taking the ecological, avifauna and heritage sensitivities into account, the recommended route alternative is **Alternative 1**.

2 SUBSTATION LOCALITY ALTERNATIVES

Substation alternative recommendations: Ecology

Substation alternative recommendations are made on the strength and combination of all the impacts and mitigating actions. As well as on the sensitivities of the various biophysical features, faunal habitats and vegetation types that each proposed site alternative impacts on.

Two alternative sites were investigated for the proposed Tekwane North Substation (Figure 7). Although the sites are fairly close there are some differences and similarities (Table 19). Both sites are mostly disturbed areas from ploughing and cultivated lands. Both are on top of a hilly area with some nearby open bushveld and drainage lines. However, Alternative 1 is more disturbed with fewer trees present. The topography of Alternative 2 is also steeper, which also creates other aspects such as erosion, etc. The southern tip of Alternative 2 is within the extent of a drainage line / small stream and will have to either be moved north and east.

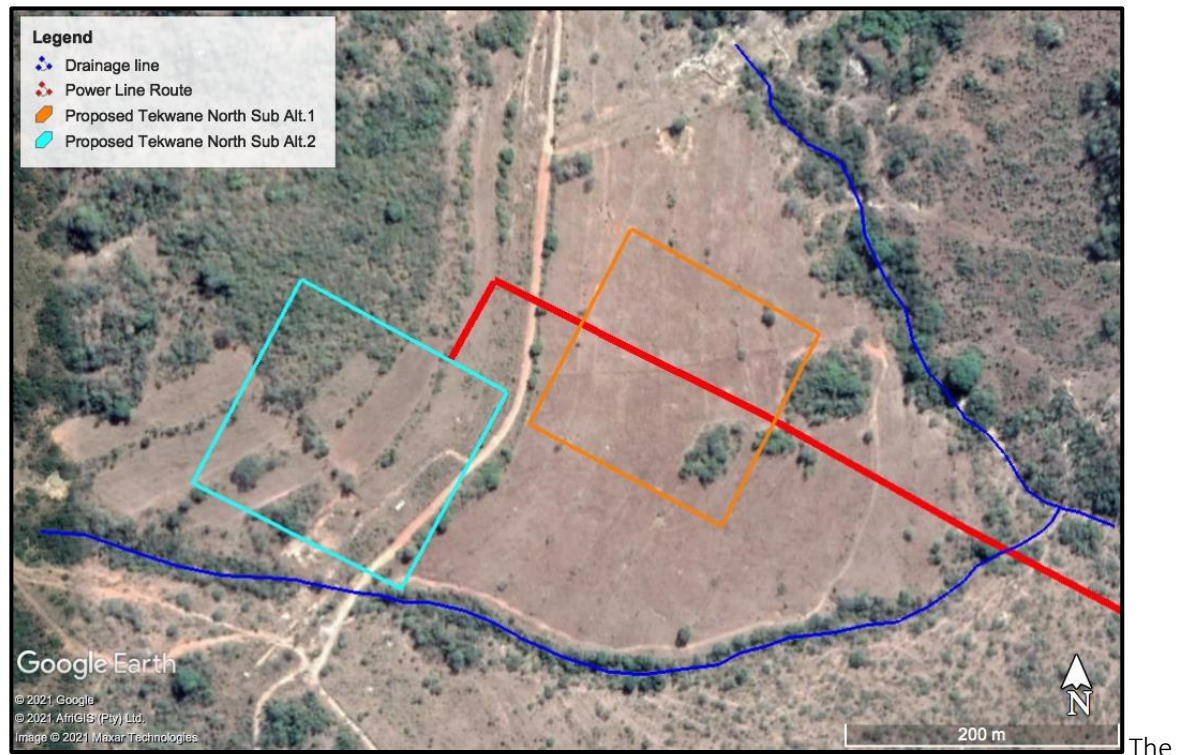


Figure 7: Tekwane North Substation Alternative Sites

A comparison between the two substation alternative sites for the Tekwane North substation, as to the number of ecologically sensitive units each one potentially impacts on, is shown below in Table 19.

Table 19: Potential ecological impacts by substation alternatives

Ecological Sensitive Aspect	Sub Alt. 1	Sub Alt. 2
Areas of high ecological sensitivity	0	0
No-Go areas in close proximity	1 (watercourse)	1 (watercourse)
No. of river / stream crossings	0	0
Drainage lines	0	1
Rocky outcrops	0	0
Ridges	0	0
Wetlands	0	0
No of potential impacts	1	2

In terms of the natural ecology the recommended substation site is: Alternative 1

Substation alternative recommendations: Avifauna

In terms of impacts the Alternative 1 is more degraded than Alternative 2. However, both sites are fairly degraded by years of cultivated farmlands. Site 2 has more trees and bushveld in the immediate vicinity

and the southern boundary is within the edge of a small stream drainage line Therefore, Alternative 1 is the preferred alternative in terms of avifauna and biodiversity in general.

Substation alternative recommendations: Heritage

The Alternative 1 site as well as the Alternative 2 site do not impact on any known heritage resources. In terms of heritage resources either site alternative may be used.

3 NO-GO ALTERNATIVE

Taking all aspects into consideration including, ecological sensitivities, red data listed species (RDL), protected trees, the type of project and related activities, as well as mitigating measures and existing basic procedures for power lines, there are no fatal flaws and the project may go ahead.

It is suggested that to maintain the status quo is not the best option for the macro environment. The reliable provision of electricity by Eskom is critical for sustainable development and related employment, and sustainable human settlements in South Africa.

Tekwane North is currently being supplied with electricity from Pienaar Tekwane North / Karino feeder which cannot support the load of 5.4MVA required by the proposed Shopping Complex as well as the recently constructed up-market housing development. There is a need to increase the capacity on the Pienaar Substation as it will also face a constant increase in electrification projects which will ultimately increase the demand. This project is meant to increase capacity on the Pienaar & Karino Substations respectively. The customer base per feeder will be reduced and therefore improve the performance of the feeder. Spare capacity for the existing resident and future load will be created which will ultimately lead to a more efficient network.

As mentioned, bulk electricity supply infrastructure is needed to supply the mentioned areas. The peak electricity load required in this area is further anticipated to increase significantly in the near future. Should this application not be approved the required demand will not be provided for.

This proposed project is therefore essential to improve the supply of electricity to the network. Should this application not be approved then the supply will not be reliable and this can result in major disturbances in provision to the customer base. The No-Go development alternative could therefore not be considered the responsible way to manage the site.

19 SPECIALIST INPUT

Specialist input was obtained to investigate the impact of the various alternatives that could accomplish the purpose of the project. The specialist input is summarised as follows:

1 BIODIVERSITY ASSESSMENT

A Biodiversity Assessment has been conducted by Flori Scientific Services . Refer to Appendix D of the BAR. The report identified the following:

Watercourses

There are no large perennial rivers or streams within the actual proposed power line servitudes and substation sites. There are however, a few small seasonal / ephemeral drainage lines and small, seasonal and ephemeral streams within the study site, which is to be expected considering the hilly topography of the area in which the project is situated.

Drainage Region

Table 20: Below is a summary of the drainage region / catchment area for the study site.

Level	Category
Primary Drainage Area (PDA)	X
Quaternary Drainage Area (QDA)	X22K
Water Management Area (WMA) – Previous / Old	Inkomati
Water Management Area (WMA) – New (as of Sept. 2016)	Inkomati-Usuthu (WMA 3)
Sub-Water Management Area	Crocodile
Catchment Management Agency (CMA)	Inkomati-Usuthu (CMA 3)
Wetland Vegetation Ecoregion	Lowveld (Group 8)
RAMSAR Site	No
Wetland FEPA	No
Fish FEPA	No
Fish FSA	Yes
Fish Corridor	No
Fish Migratory	No
National Strategic Water Source Area (SWSA)	No
Provincial important Water Source Area (WSA)	No
Priority Quaternary Catchment	No

Vegetation

The study site is situated within the Savanna Biome of South Africa, which is characterised by a mix of a lower grassy layer, middle shrub layer and an upper woody layer of trees. The study site is within the Lowveld Bioregion of the Savanna Biome and within the original extent of the veld types of Pretoriuskop Sour Bushveld and Crocodile Gorge Mountain Bushveld. None of the veld types are threatened.

The vegetation of the study area is characterised by a mix of transformed to highly degraded vegetation in the built-up, urban areas; to some patches of pristine bushveld on top of untouched rocky hills. There is also a mix of moderately degraded bushveld and vegetation, along the fringes of urban areas and in some valley and open areas where there is presently minimal development. There are some good examples of Crocodile Gorge Mountain Bushveld present in the study area on top of or along the slopes of some of the rocky hills.

Priority areas

Only the Entokozweni Substation site is within a priority area, namely a demarcated ecological support area (ESA). There are no other priority areas in the study area, including critical biodiversity areas (CBAs).

Sensitivity analyses

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The highest calculated sensitivity unit of the two categories is taken to represent the sensitivity of that ecological unit, whether it is floristic or faunal in nature.

Ecological sensitivity analysis

Ecological community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity
Transformed	Low	Low	Low
Bushveld	Medium	Medium	Medium
Rocky Hills	Medium / High	Medium / High	Medium / High
Watercourse	Medium / High	Medium / High	Medium / High

High: 80% – 100%; Medium/high: 60% – 80%; Medium: 40% – 60%; Medium/low: 20% – 40%; Low: 0% – 20%

The rocky hills have a higher ecological sensitivity than the bushveld habitats. There is also a greater diversity of flora and fauna on the rocky hills. The greater area is full of these rocky hills and therefore they are not viewed as 'High' sensitivity or 'No-go' areas. The ecological sensitivity of the watercourses in terms of fauna and flora is very similar to the rocky hills because this is where most of these small watercourses occur and their riparian zone is not distinctive of the surrounding terrestrial zone. Although the little watercourses have a real ecological sensitivity of 'Medium / High', they are, by default, viewed as having a sensitivity of 'High'.

Fatal flaws

There are no fatal flaws and the project may proceed.

Sensitivity Map

The sensitivity map for the study site, across an investigation area of 200m wide along the power line route options (100m each side of central line), is shown in the figure below. Only the high and medium sensitive areas are shown. The rest of the areas within the 200m corridors are all low sensitivity. A sensitivity map in the area of the two alternative sites for the Tekwane North Substation is shown below as well. The western site as a sensitivity of medium, while the eastern site has a sensitivity of low.

The most sensitive areas in the study area 'High Sensitivity' are the untouched / undeveloped rocky granite hills and koppies (outcrops), and the small streams / drainage lines. The medium sensitive areas tend to be the fair to moderately degraded bushveld. There are also protected trees present in some of these bushveld (medium sensitive) areas.

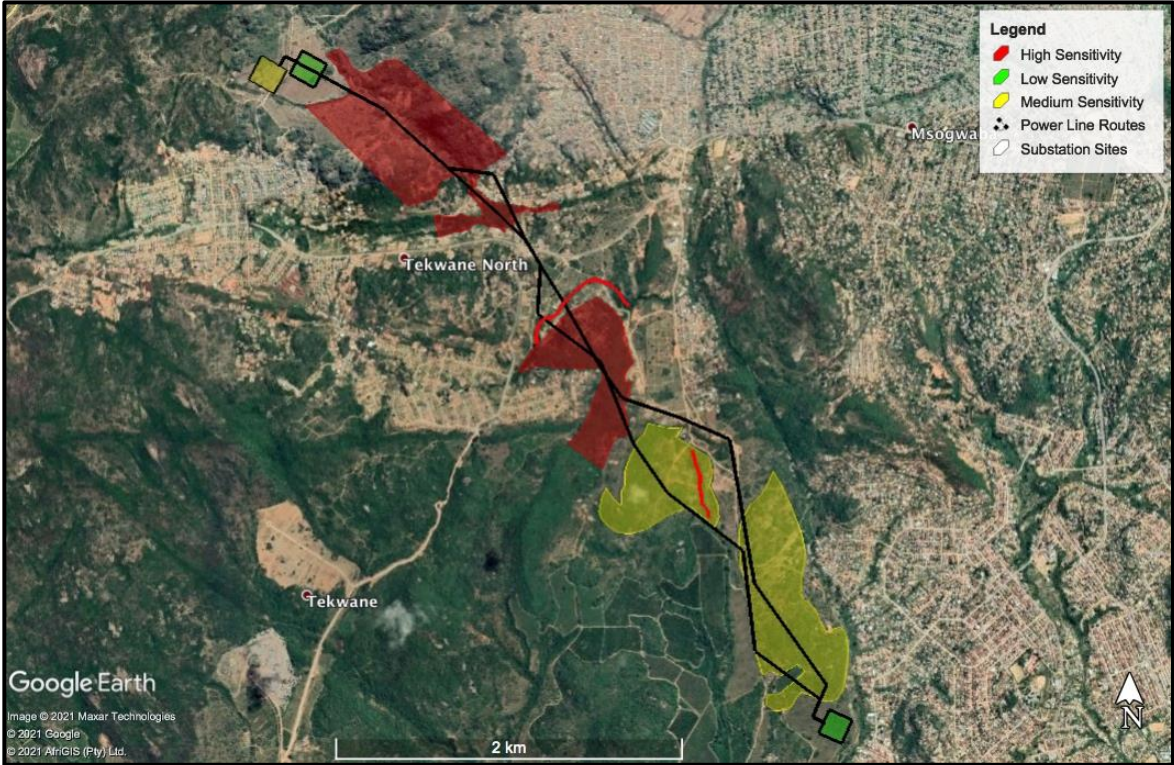


Figure 8: Sensitivity map of the study area

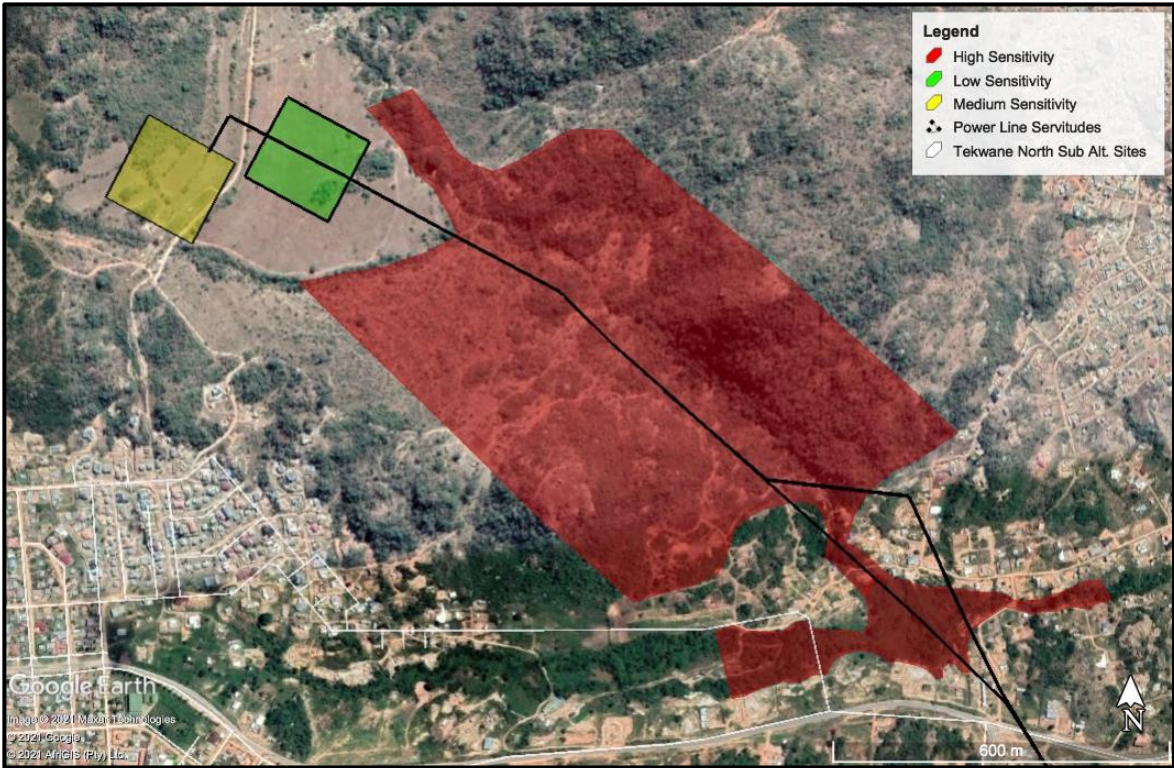


Figure 9: Sensitivity map in the area of the two site options for the Tekwane North Substation

Conclusions

The conclusions of the ecological study are as follows:

- The study site is within the original extent of the veld types / ecosystem known as Pretoriuskop Sour Bushveld and Crocodile Gorge Mountain Bushveld.
- Both veld types are not threatened.
- There are three protected tree species in the study area (*Breonadia salicina*, *Pterocarpus angolensis* and *Sclerocarya birrea*). It is fairly likely that some of these trees will need to be removed / destroyed. A tree permit will be required.
- The study site is not within a critical biodiversity area (CBA). Only the Entokozweni Substation site is within a demarcated ecological support area (ESA). However, the demarcations are old and not reflective of the situation on the ground. The site is also not sensitive.
- The study site is not within any priority areas. There are also no protected areas within a 5km radius of the study site.
- There are no large rivers or streams in the study area. However, there are a few small drainage lines and small seasonal streams. The project should have no impact on these as the line should be designed to jump these watercourses. There are no watercourses within the proposed substation sites.
- There are no obvious fatal flaws in terms of the natural ecology.

Recommendations

The recommendations of the study are as follows:

- There are no obvious fatal flaws in terms of the natural ecology and it is the opinion of the specialist that the project should be authorised and allowed to proceed.
- All recommended mitigating measures should be implemented and strictly adhered to.
- A tree permit application process is required.
- It is highly unlikely that a water use licence application (WULA) or general authorisation (GA) process for watercourses is required.
- 32m Buffer Zones (No-Go Zones) from the edge of all watercourses must be implemented and strictly enforced. No power line poles / pylons may be planted within these buffer zones.
- A final walk-down is recommended in the sensitive areas to check and finalise the actual pole positions. Any problematic pole positions can then hopefully be moved / re-aligned.
- It is highly likely that a few protected trees will need to be removed / destroyed. It is strongly recommended that for every one tree destroyed, two new, young trees are planted in a similar nearby environment. This must form part of the construction phase of the project.
- The power line route that is recommended is: Alternative 1.
- The Tekwane North Substation site that is recommended is: East site (Alternative 1).

2 AVIFAUNAL ASSESSMENT

An Avifaunal Assessment has been conducted by Flori Scientific Services. Refer to Appendix D2 of the BAR. The report identified the following:

Priority areas

The Study Site is not within any national priority areas.

The closest priority areas are the Methethomusha Nature Reserve (approximately 5,5km east) and Kruger National Park (approximately 16km east). The entire Kruger National Park is also an Important Bird Area

(IBA). The Rietbokloop, the biggest watercourse close to the study area is not a NFEPA watercourse. The closeness of the Kruger National Park and Methethomusha Nature Reserve will increase the amount and species of birds moving in and out of the study area, as well as simply traversing it.

Sensitivity analyses

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The highest calculated sensitivity unit of the two categories is taken to represent the sensitivity of that ecological unit, whether it is floristic or faunal in nature.

Table 21: Ecological sensitivity analysis

Ecological community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity
Transformed	Low	Low	Low
Bushveld	Medium	Medium	Medium
Rocky Hills	Medium / High	Medium / High	Medium / High
Watercourse	Medium / High	Medium / High	Medium / High

High: 80% – 100%; Medium/high: 60% – 80%; Medium: 40% – 60%; Medium/low: 20% – 40%; Low: 0% – 20%

The rocky hills have a higher ecological sensitivity than the bushveld habitats. There is also a greater diversity of flora and fauna on the rocky hills. The greater area is full of these rocky hills and therefore they are not viewed as 'High' sensitivity or 'No-go' areas. The ecological sensitivity of the watercourses in terms of fauna and flora is very similar to the rocky hills because this is where most of these small watercourses occur and their riparian zone is not distinctive of the surrounding terrestrial zone. Although the little watercourses have a real ecological sensitivity of 'Medium / High', they are, by default, viewed as having a sensitivity of 'High'.

Fatal flaws

There are no fatal flaws and the project may proceed.

Sensitivity Map

The sensitivity map (avifauna) is shown below. The sensitivity is based on areas of high-risk negative impacts for birds and not necessarily on habitat status.

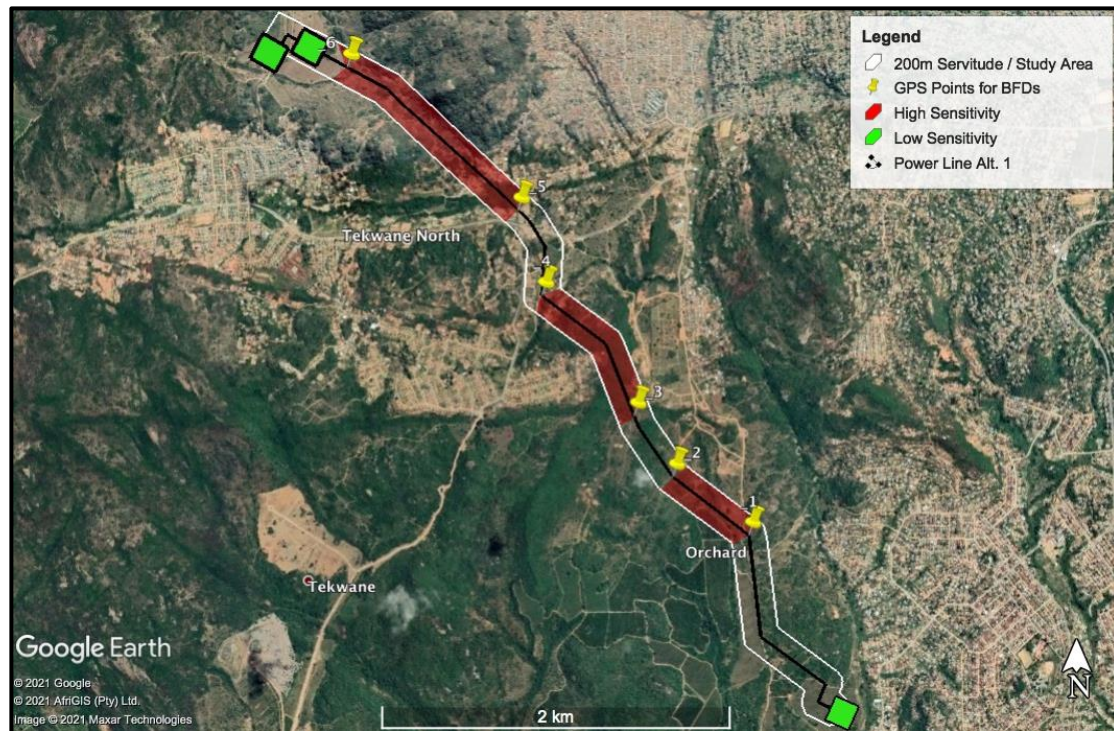


Figure 10: Sensitivity map: Avifauna

Below is the table showing the GPS points where Bird Flight Diversers (BFDs) need to be attached. The BFDs need to be attached across the section of power line from Point 1 to Point 2; from Point 3 to Point 4; and from Point 5 to Point 6 (Figure 10). These are the high-risk areas for bird collisions. A close-up of the three sections can be seen below in Figure 11, Figure 12, Figure 13 & Figure 14.

Table 22: GPS Coordinates for BFDs

ID No	Coordinates	Comments
1	25°26'52.34"S; 31° 9'11.04"E	Distance of 553m. Across a valley area with a small stream in the middle and along the length of an orchard
2	25°26'41.45"S; 31° 8'55.32"E	
3	25°26'30.16"S; 31° 8'47.30"E	Distance of 890m. Across a rocky ridge/hill which is elevated and contains some pristine bushveld. Area near Point 4 also crosses a small stream
4	25°26'8.26"S; 31° 8'28.69"E	
5	25°25'52.81"S; 31° 8'23.75"E	Distance of 1 222m. Across a stream and old dam, up over an elevated rocky mountainous area and along a small mountain stream . drainage line.
6	25°25'27.69"S; 31° 7'50.17"E	

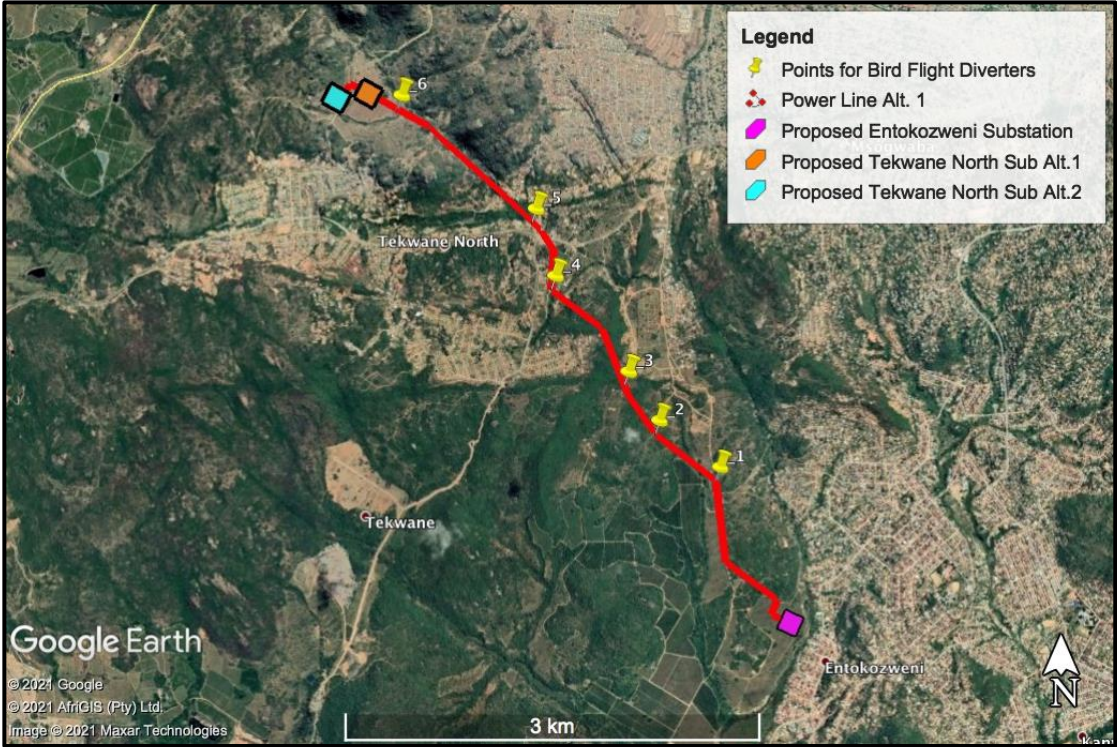


Figure 11: Positions for Bird Flight Diverters (BFDs)

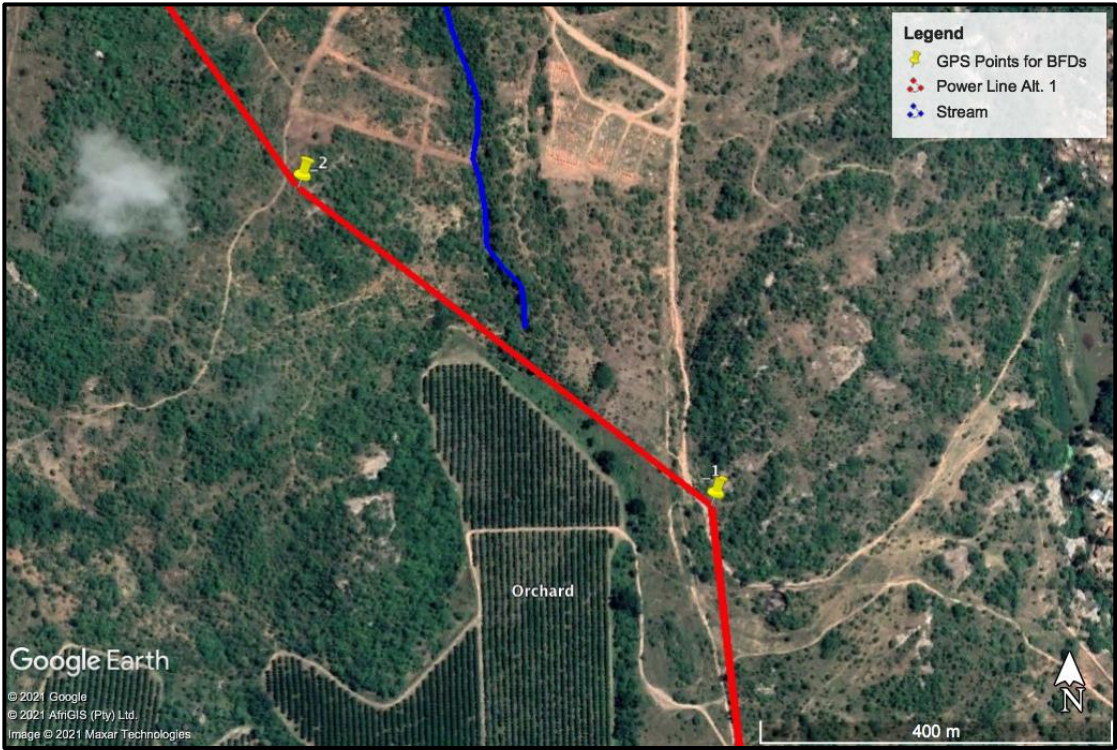


Figure12: BFDs between Points 1 & 2

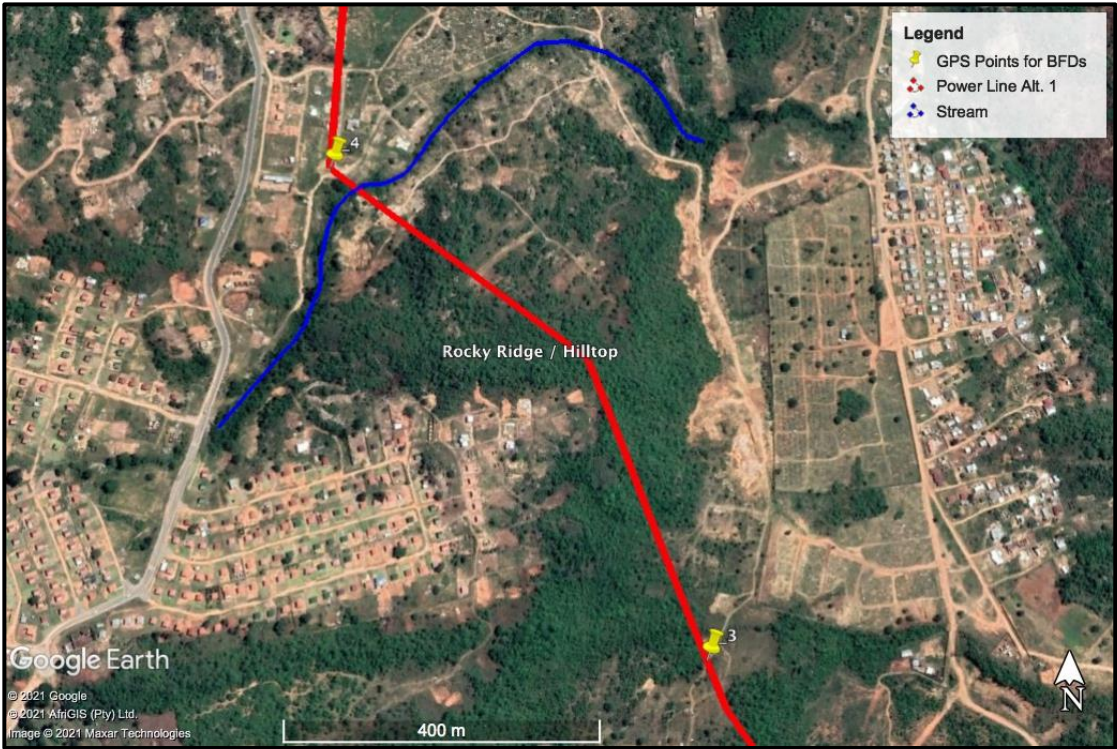


Figure13: BFDs between Points 3 & 4

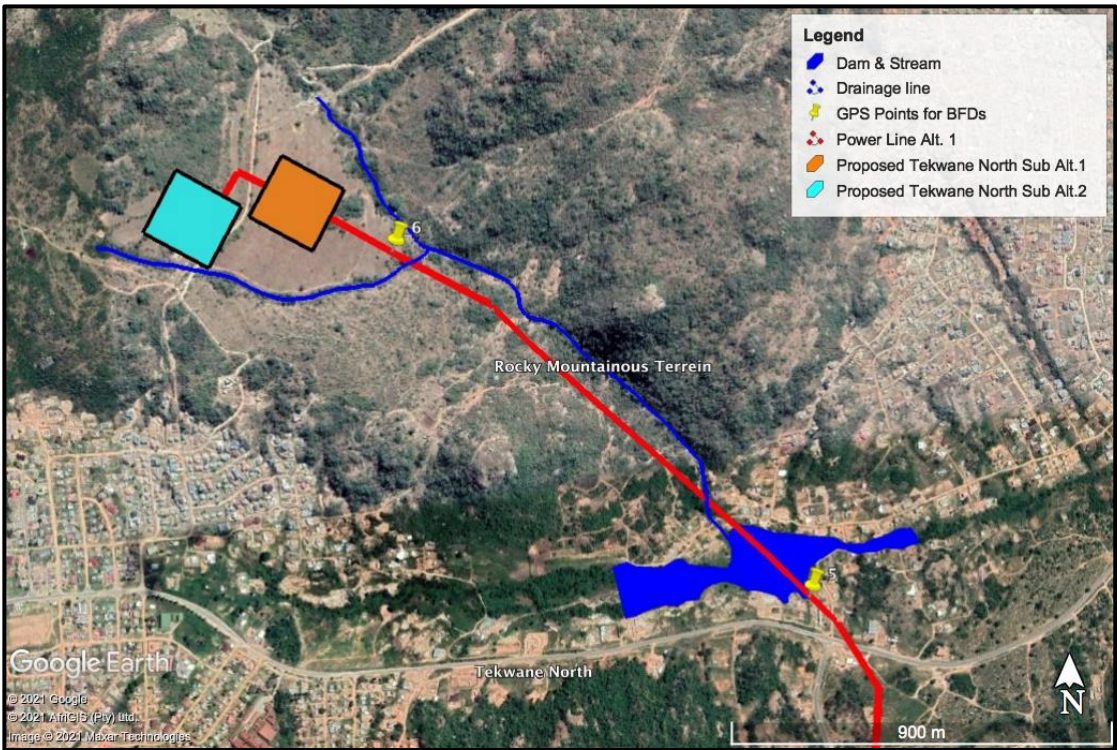


Figure 14: BFDs between Points 5 & 6

Conclusions

The conclusions of the ecological study are as follows:

- The study site is within the original extent of the veld types / ecosystem known as Pretoriuskop Sour Bushveld and Crocodile Gorge Mountain Bushveld.
- The study site is not within a critical biodiversity area (CBA). Only the Entokozweni Substation site is within a demarcated ecological support area (ESA).
- The study site is not within any priority areas, including Important Birds Areas (IBAs). There are also no protected areas within a 5km radius of the study site.
- There are no large rivers or streams in the study area. However, there are a few small drainage lines and small seasonal streams.
- There are no obvious fatal flaws in terms of the bird ecology.

Recommendations

The recommendations of the study are as follows:

- There are no obvious fatal flaws in terms of the natural ecology and avifaunal component and it is the opinion of the specialist that the project should be authorised and allowed to proceed.
- All recommended mitigating measures should be implemented and strictly adhered to.
- A final walk-down is recommended in the sensitive areas to check and finalise the actual pole positions. Any problematic pole positions can then hopefully be moved / re-aligned.
- Bird Flight Diverters (BFDs) must be installed in the areas indicated within the report. These areas include high-risk bird sensitive areas such as watercourse crossings and rocky ridges / hilltops where there is pristine bushveld, along with the elevated power line which creates potential collisions / bird-strikes.
- The Bird Flight Diverters (BFDs) must be placed across the demarcated areas of the powerline along the earth wire at 5m intervals, alternating black and white.
- Each monopole must be fitted with bird perches on the top. This helps to draw large birds (eg. Vultures) away from the dangerous / risky insulators that can result in electrocutions.
- All Eskom guidelines must be implemented and adhered to. These include important guidelines such as Bird Collision Guidelines (www.eskom.co.za).
- The power line route that is recommended is: Alternative 1.
- The Tekwane North Substation site that is recommended is: East site (Alternative 1).

3 HERITAGE IMPACT ASSESSMENT

A Heritage Impact Assessment has been conducted by HCAC - Heritage Consultants. Refer to Appendix D of the BAR. A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

A Phase I Heritage Impact Assessment (HIA) study was done and heritage resources as outlined in Section 3 of the National Heritage Resources Act 25 of 1999 were found in the project area.

Two alternatives were assessed, key findings include:

- Alternative 1 is an alignment sited in the field during the current site visit conducted by HCAC to avoid heritage sensitive areas, mostly being large cemeteries;

- The majority of Alternative 2 was authorised in 2015, but the EA expired, and some permutations of this route was investigated as part of this study. The HIA for this alignment recorded cemeteries, an Iron Age site and a homestead (Van Vollenhoven 2013);
- The study area is largely disturbed by township development and agricultural activities that would have impacted on surface indicators of heritage sites.
- Alternative 1 does not impact on any known heritage resources and is therefore the preferred alternative, as Alternative 2 traverses several cemeteries.

The impact of the Alternative 1 on known heritage resources is low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMP and based on approval from SAHRA.

The report makes the following observations:

Four heritage features (Table 23 and Figure 15) were recorded consisting of cemeteries that are rapidly expanding. A single find spot was recorded indicating use of the wider landscape by Stone Age people and Iron Age communities.

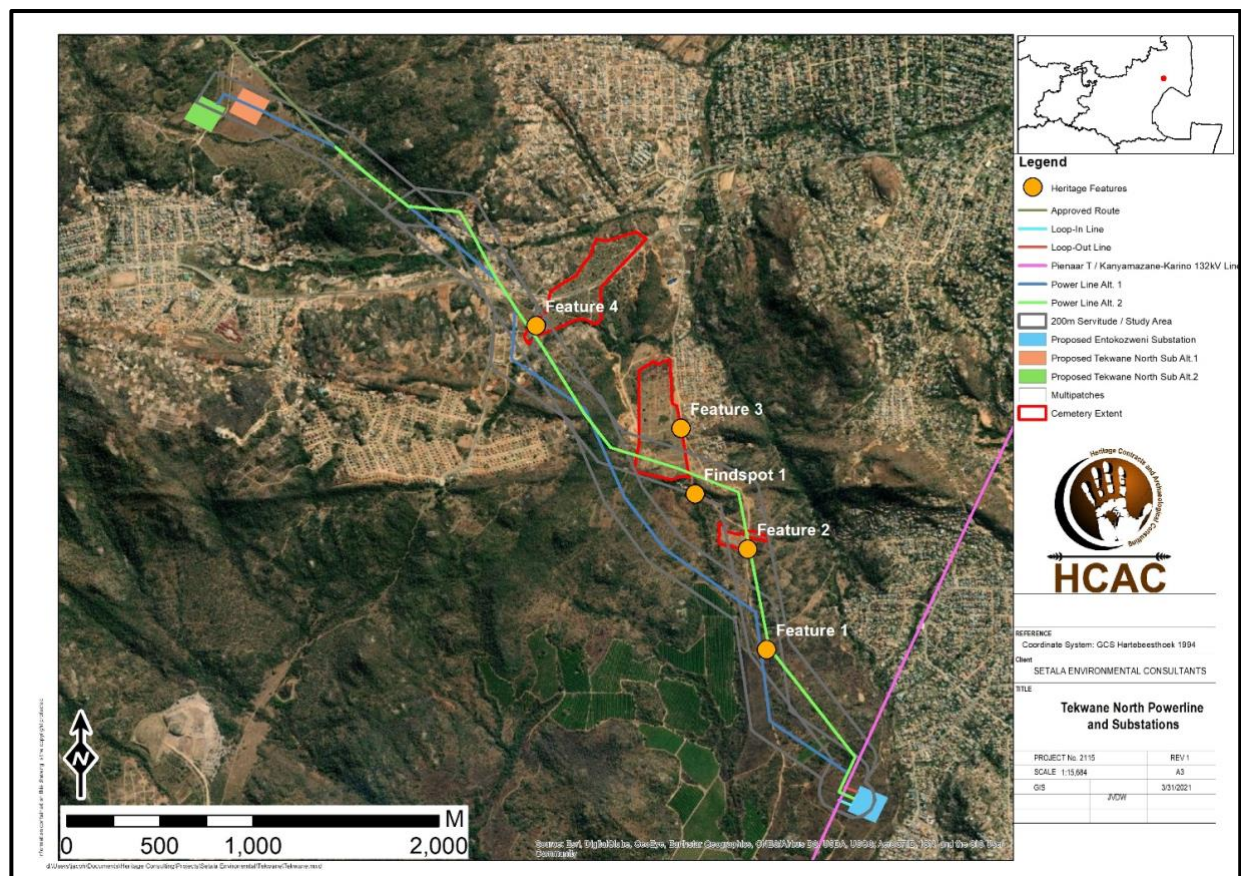


Figure 15: Site distribution map

Table 23: Heritage features identified

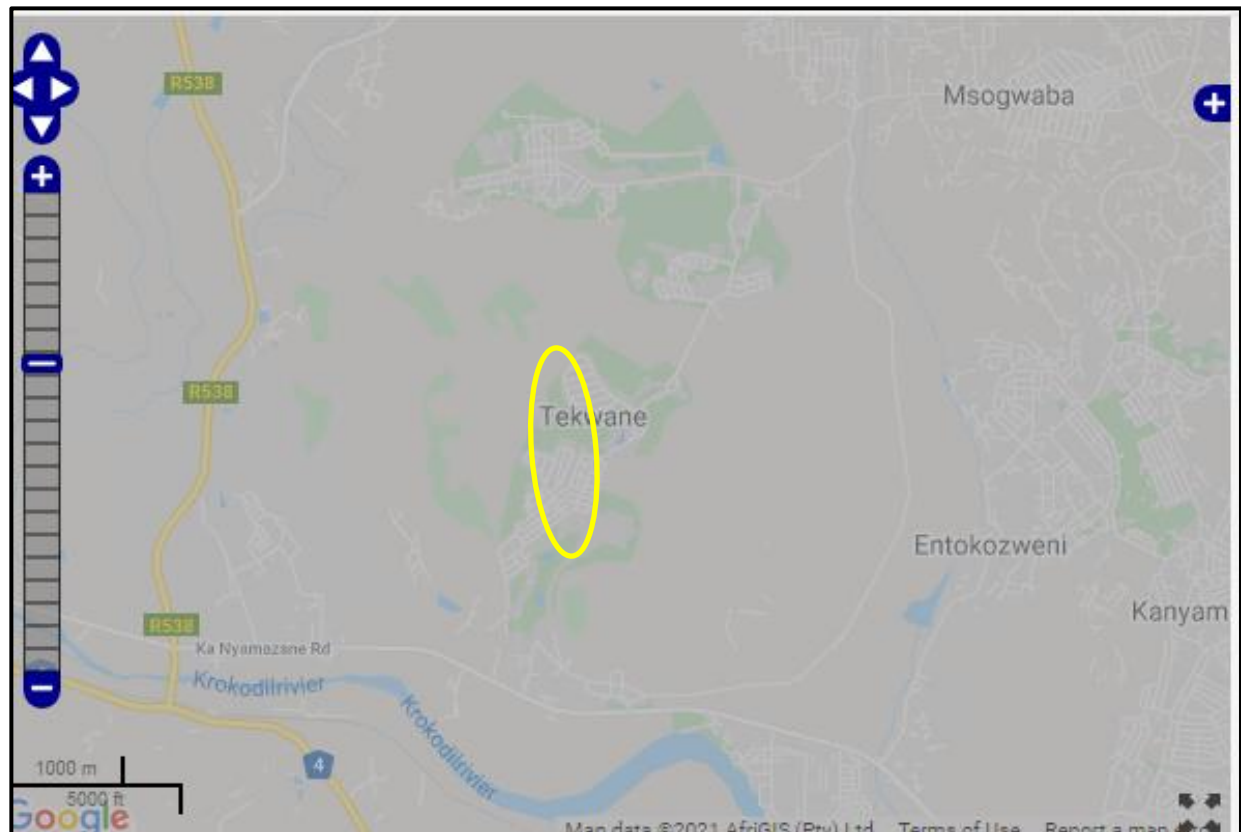
Label	Longitude	Latitude	Description	Field Rating and Significance	Alternative
Findspot 1	31° 09' 00.5616" E	25° 26' 31.7509" S	Multiple MSA flakes Undecorated ceramics	GP C Low	NA
Feature 1	31° 09' 12.9925" E	25° 26' 58.8480" S	House foundation/Farmhouse Water tank(cement) Close to large water reservoir also recorded in the Van Vollenhoven HIA (2013)	GP C Low	2
Feature 2	31° 09' 09.6732" E	25° 26' 39.3505" S	New informal cemetery, several new grave pits is visible indicating the rapid expansion of the cemetery.	GP A High Social Significance	2
	31° 09' 09.7055" E	25° 26' 41.3269" S		GP A High Social Significance	2
Feature 3	31° 08' 51.0433" E	25° 25' 49.1124" S	Large Municipal graveyard that is marked by a cement palisade fence. Recent addition to the cemetery is visible where the cemetery is expanding to the south.	GP A High Social Significance	2
Feature 4	31° 08' 32.8883" E	25° 26' 02.4469" S	Large informal graveyard extending on both sides of the tar road	GP A High Social Significance	2
	31° 08' 33.1439" E	25° 26' 02.2955" S		GP A High Social Significance	2

Recommendations:

- Heritage walkdown of the recommended alternative and pylon positions prior to construction;
- If heritage resources are identified during the walk down, it is recommended that the line should be micro sited to avoid these features and allow for a sufficient buffer around the identified features;
- Implementation of a chance find procedure for the project.

4 PALEONTOLOGICAL SENSITIVITY

Based on the SAHRA Paleontological map the area (Figure 16) is of insignificant paleontological sensitivity and no further studies are required for this aspect.



Colour	Sensitivity	Required Action
RED	VERY HIGH	Field assessment and protocol for finds is required
ORANGE/YELLOW	HIGH	Desktop study is required and based on the outcome of the desktop study, a field assessment is likely
GREEN	MODERATE	Desktop study is required
BLUE	LOW	No paleontological studies are required however a protocol for finds is required
GREY	INSIGNIFICANT/ZERO	No palaeontological studies are required
WHITE/CLEAR	UNKNOWN	These areas will require a minimum of a desktop study. As more information comes to light, SAHRA will continue to populate the map.

Figure 16: Paleontological Sensitivity of the approximate study area (yellow polygon) is indicated as insignificant.

20 SPATIAL DEVELOPMENT TOOLS

Spatial development tools used included ArcGIS v.10.2; Google Earth Professional; SANBI's BGIS MapViewer (www.bgis.sanbi.org) and Garmin Maps.

These tools, along with relevant datasets such as vegetation types, rivers, Mpumalanga Biodiversity Sector Plan, etc. were used in the desktop assessment as well as the final biodiversity specialist reports. ArcGIS as well as Google Earth Professional were used to produce the detailed maps used in the reports.

The outcome is that these spatial development tools give accurate layouts and positions of important data such as Critical Biodiversity Areas. The tools are also used to create accurate and visual maps showing floodlines, watercourses, sensitive areas, etc.

1 NATIONAL PRIORITY AREAS

National priority areas include formal and informal protected areas (nature reserves); important bird areas (IBAs); RAMSAR sites; National fresh water ecosystem priority areas (NFEPA) and National protected areas expansion strategy (NPAES) areas. The study site is not within any national priority areas (Figure 9). The closest priority areas are the Methethomusha Nature Reserve (approximately 5,5km east); Kruger National Park (approximately 16km east); and two NPAES focus areas along the north and south of the Methethomusha NR. The NPAES is the Kruger Lowveld NPAES. The entire Kruger National Park is also an Important Bird Area (IBA). The study area is outside of the Kruger Park's 10km buffer area and the Methethomusha NR's 5km buffer (Protected Areas Register – DEA Website).

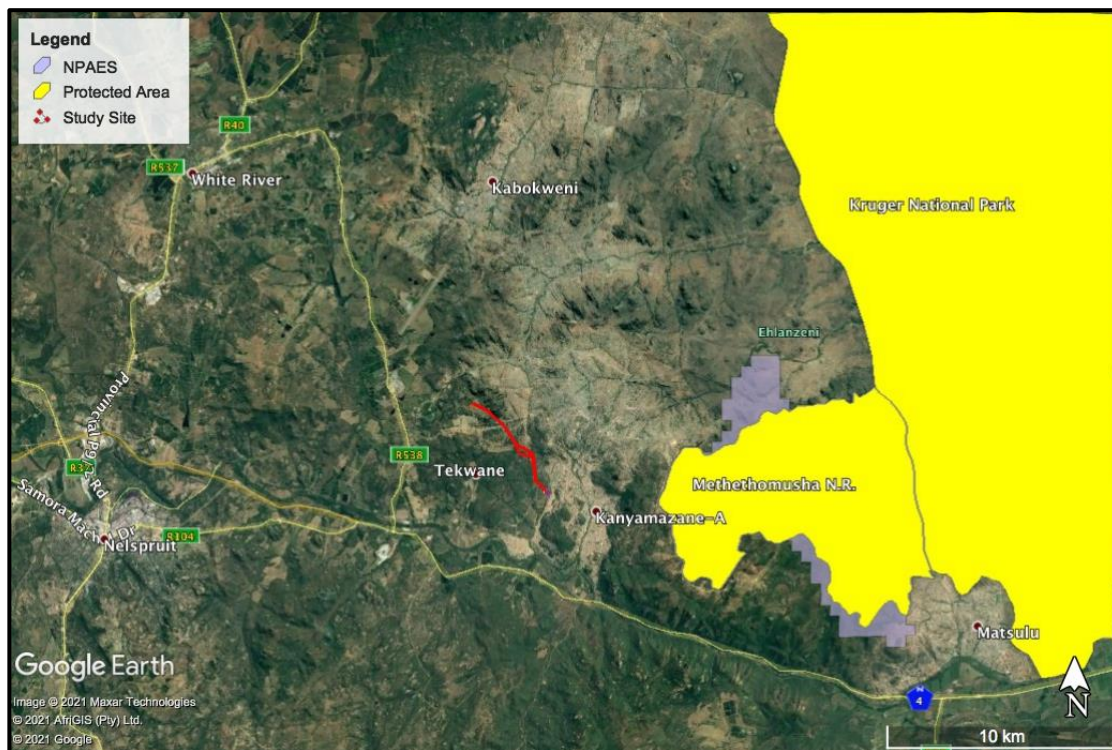


Figure 17: Priority areas

2 MPUMALANGA CONSERVATION PLAN

The Mpumalanga Biodiversity Sector Plan (2014) demarcates and lists the CBAs and ESAs found throughout the province. Critical biodiversity areas (CBAs) are areas of biodiversity importance and need to be avoided in terms of most development projects. Ecological support areas (ESAs) are typically buffer areas and linking corridors between CBAs and other important priority areas. The study site is not within a Critical Biodiversity Area (CBA). The site of the proposed Entokozweni Substation is on the edge of an Ecological Support Area (ESA). This ESA is an Aquatic ESA that runs along (and including) the Rietbokloop

(stream) and the entire valley, which is mostly transformed and built-up. The ESA is not realistic and needs to be updated. The rest of the study area is not within a demarcated ESA.



Figure 18: CBAs and ESAs

3 NATIONAL ENVIRONMENTAL SCREENING TOOL

The National Web based Environmental Screening Tool is a geospatial web-enabled application providing for screening of sites for environmental sensitivity and the placement of proposed developments in relation to the impact avoidance hierarchy. It produces the report required in terms of regulation 16(1)(v) of the EIA regulations.

Objectives of the screening tool

- The National Development Plan calls for an efficient and effective environmental legislative process including the Environmental Impact Assessment process
- The development of the National Web based Environmental Screening Tool forms part of ensuring ongoing improvement of the EIA process to ensure efficiency and effectiveness
- The Screening Tool aims to flag areas of potential environmental sensitivity in relation to a proposed site and development footprint
- The tool enables the applicant to manipulate the development footprint on a site to avoid environmental sensitivities
- The report generates a list of specialist assessments that should form part of the assessment reports to be submitted with the EIA application based on the national sector classification and the sensitivity of the site
- Supports the implementation of the Assessment Protocols

- Assessment Protocols provide minimum information to be included in a specialist report to facilitate the decision making process
- The tool identifies any specific exclusions, restriction, prohibitions or any exceptions to the EIA process that apply to a particular site as well as any specific information that must be consulted in relation to that site
- In time to provide a mechanism to collect new environmental information surveyed or compiled by the specialists through the preparation of assessment reports for verification by data custodians for incorporation into relevant national data sets.

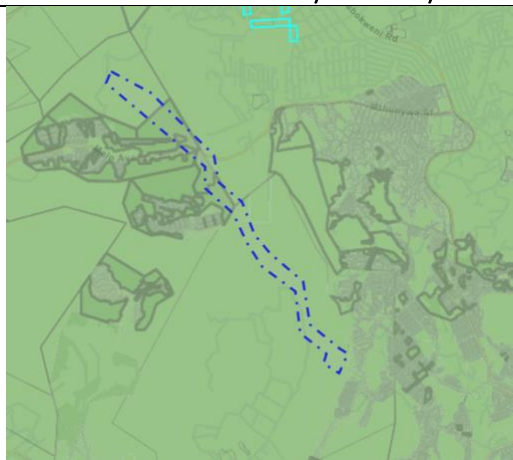
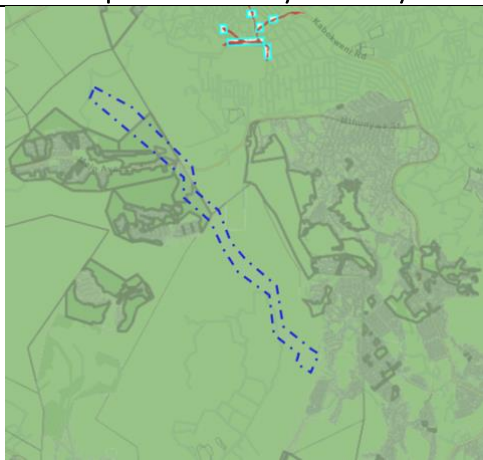
The Environmental Assessment Practitioner (EAP) consulted the DEA Screening Tool to inform on the environmental sensitivity of the proposed development site. The following summary of the site environmental sensitivities is identified. Only the highest environmental sensitivity is discussed. The footprint environmental sensitivities for the proposed development footprint as identified, are indicative only.

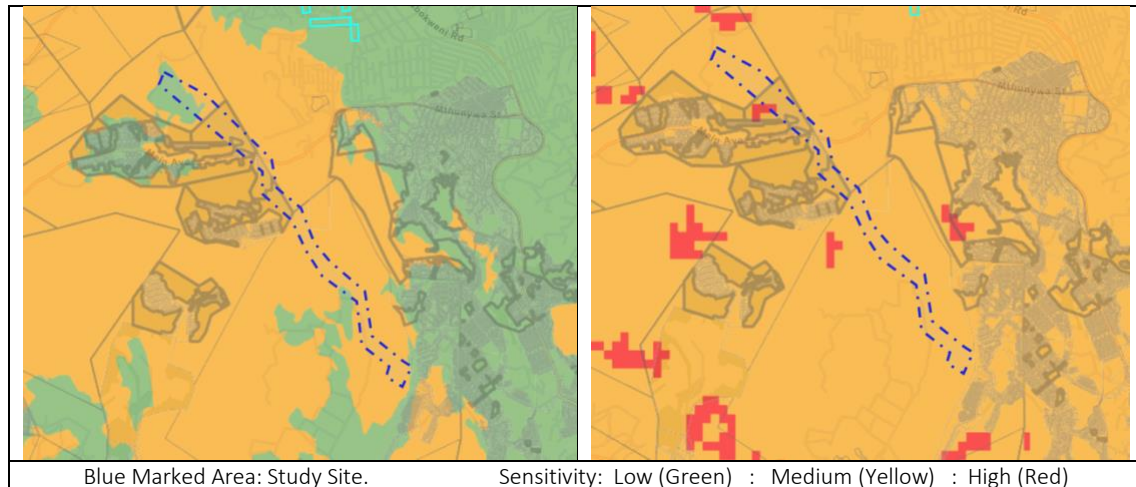
Environmental Sensitivity of study site according to the Environmental Screening Report:

- Terrestrial biodiversity combined sensitivity: Low.
- Aquatic biodiversity combined sensitivity: Low.
- Plant species theme: Medium.
- Animal species theme: Medium.

Table 24, below, shows the maps generated from the DEA Screening Tool.

Table 24: Maps generated from DEA Screening Tool

Terrestrial Biodiversity Sensitivity	Aquatic Biodiversity Sensitivity
	
Plant Species Theme	Animal Species Theme



During field investigations the DEA Screening Tool assessment, was verified (ground-truthed). Overall the DEA screening / desktop assessment corresponded with what was observed on the ground, during field investigations.

Although most of the terrestrial and aquatic has a sensitivity of 'Low', it is felt that the small drainage lines and streams in the study site have a sensitivity of 'High'. Furthermore, that the small granite-boulder rocky hills should also be viewed as having a sensitivity of 'Medium' or 'Medium / High'.

The assessment for fauna (animals) and flora (plants) could be fine-tuned to show that built-up, transformed areas had actual sensitivities of 'Low'. However, when looking holistically at the larger area the assessment is accurate.

21 PUBLIC PARTICIPATION

Setala Environmental has taken cognisance of the requirements for public participation in terms of the 2014 EIA Regulations, as amended and has ensured that the public participation principles are upheld. A successful Public Participation Programme (PPP) is one that is inclusive, actively engages the public and provides ample opportunity for the public to participate in the process. This document provides an overview of the PPP undertaken as part of the BA process for the proposed project.

The purpose of the PPP is to ensure that the issues, inputs and concerns of Interested and Affected Parties (I&APs) are taken into account during the decision-making process. This requires the identification of I&APs (including authorities and the public), communication of the process and findings to these I&APs and the facilitation of their input and comment on the process and environmental impacts, including issues and alternatives that are to be investigated. The steps taken during the execution of the PPP undertaken for this project are detailed in the section that follows.

Refer to Comments and Response Report attached as *Appendix E6*.

1 ADVERTISEMENT AND NOTICE

Site notice positions	Notice displayed at the following locations: <ul style="list-style-type: none"> At the entrance to Tekwane Citrus Estate At the crossing of the power line with the Msogwaba – Tekwane North tar road.
Date placed	29/03/2021
Publication name	Mpumalanga news
Date published	10/03/2021

(Refer to Appendix E1b: Proof of site notices)

(Refer to Appendix E1a: Proof of newspaper notice)

2 PUBLIC NOTIFICATION

A consultation process was undertaken with the intent of informing key community stakeholders, comprising the Municipal structures and the local communities about the proposed development and the Basic Assessment process underway.

Identification of Interested and Affected Parties

The PPP for the project was initiated with the development of a comprehensive I&AP database. The list of I&APs was updated on a regular basis during the course of the project. Key stakeholders were identified at the beginning of the PPP, these included: Key stakeholders, commenting authorities and landowners/land users. Refer to Appendix E4a: Register of Interested and Affected Parties for a complete list.

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA)
- Department of Water and Sanitation, Inkomati-Usuthu (WMA 3), Sub WMA Crocodile, QDA X22K
- SA Heritage Resources Agency
- Mpumalanga Heritage Authority
- Department of Mineral Resources and Energy
- Department of Agriculture, Land Reform and Rural Development (DALRRD): Commission on Restitution of Land Rights, Regional Land Claims Commissioner
- Department of Agriculture, Land Reform & Rural Development: Land and Soil Management
- Department of Agriculture, Land Reform & Rural Development: Forestry & Natural Resource management, Forestry Regulation & Oversight, Compliance & Enforcement Section
- City of Mbombela Local Municipality
- Ehlanzeni District Municipality
- Wildlife and Environmental Society of SA
- Endangered Wildlife Trust
- Department of Public Works, Roads and Transport, Mpumalanga
- South African National Roads Agency SOC Ltd
- Transnet Freight Rail: Environmental Management
- SA Civil Aviation Authority
- Sasol Gas Limited
- Eskom Transmission, Property Rights Assets Management (PRAM)
- Eskom Distribution, Mpumalanga Operating Unit
- Affected landowners

Background Information Document

- A comprehensive background information document (BID) was compiled with the main aim to identify issues, and potential impacts associated with this project. It included a description of the status quo of all relevant environmental components as well as the proceedings of the PPP and communication with registered Interested & Affected Parties (I&APs). BID attached as Appendix E2a.
- On 10/03/2021 the documentation was submitted for comment to all I&APs.
- The due date for comment was 14/04/2021. This allowed for a comment period of 30 days.
- Copies of the notification to I&APs are included as Appendix E2b.

Landowner notification

The landowners throughout a project area in general play an important roll in assisting with the identification of issues and project alternatives. The landowners/ land users affected by the proposed power line were notified of the project. They are provided the chance to provide comment to the proposed project.

3 MEETINGS AND SITE VISITS

Site visits with key stakeholders

- 29/03/2021 - Eskom Distribution, Mpumalanga Operating Unit

Public meeting/ Open day

- The COVID-19 Epidemic and the Nation-wide Lockdown had a significant impact on the undertaking of EIA processes and in specific the Public Participation Processes.
- The Public Participation Process has to comply with the "DIRECTIONS REGARDING MEASURES TO ADDRESS, PREVENT AND COMBAT THE SPREAD OF COVID-19 RELATING TO NATIONAL ENVIRONMENTAL MANAGEMENT PERMITS AND LICENCES", published in various subsequent Government Notices.
- In order to comply with the above, the opportunity to partake in the Public Participation Process without face-to-face contact was provided.
- The I&APs were provided with various options to provide comment or request more information. Communication was proposed in writing via fax or email, and verbally via text messages, whatsapp, zoom or teams sessions.
- The purpose of engagement was to furnish all interested parties with information regarding the extent of the project, the proposed alternatives, and the extent of the Environmental Impact Assessment Process.
- Copies of the invitations to comment, to be included as Appendix E2c of the final BAR.

4 DISTRIBUTION OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENT

On 10/05/2021 notification of the availability of the Draft Basic Assessment Report (DBAR) was submitted to all I&APs. (Proof to be included in Appendix E2c of the final BAR).

The DBAR was available for comment on the Setala website using a given link. The comment period was for 30 days until 14/06/2021.

Copies of the DBAR were submitted to the following key stakeholders:

- Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs, Environmental Impact Management
- City of Mbombela Local Municipality, Environmental Management Services

- Department of Water and Sanitation, Inkomati-Usuthu (WMA 3), Sub WMA Crocodile, QDA X22K
- SA Heritage Resources Agency

5 COMMENTS AND RESPONSE REPORT

The Public Participation Programme allowed for informed and responsible decision-making by all interested and affected parties. A summary of I&AP comments and the consultant's responses to these comments are provided below. (The original I&AP comments are included in *Appendix E3*). Refer to Comments and Response Report attached as *Appendix E6 for detailed information*.

List of authorities from whom comments have been received:

- Mpumalanga Department of Public Works, Roads and Transport: Section Transport Infrastructure
- Sasol Gas Limited
- Department of Agriculture, Land Reform and Rural Development, Land and Soil Management
- The SA Civil Aviation Authority

Key stakeholders from whom comments have been received:

- Tekwane Citrus Estate

6 SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

No	Date	Stakeholder	Comments	Response
1	11-03-2021	Mpumalanga Department of Public Works, Roads and Transport: Section Transport Infrastructure	Mpumalanga Department of Public Works, Roads and Transport: Section Transport Infrastructure will provide final comment as soon as the final power line route is available. The affected Provincial roads could be D936 and D2296.	Noted. The DBAR is submitted to them
2	15-03-2021	Sasol Gas Limited	Sasol Gas notified that they will not be affected by the proposed development.	Noted
3	16-03-2021	Department of Agriculture, Land Reform and Rural Development, Land and Soil Management	Department of Agriculture, Land Reform and Rural Development, Land and Soil Management registered as I&AP.	Registered
4	17-03-2021	The SA Civil Aviation Authority	The SA Civil Aviation Authority advises that the SACAA procedure and processes should be followed as the project might impact.	Noted. An application to the SACAA to be submitted.
5	23-03-2021	Department of Agriculture, Land Reform & Rural Development, Mpumalanga, Directorate: Land and Soil Management	Doreen Sithole Registered via telephone doreens@dalrrd.gov.za	Registered
6	23-03-2021	Tekwane Citrus Estate	Tekwane Citrus Estate registered as an I&AP.	Registered

7 CONCLUSION OF PUBLIC PARTICIPATION PROGRAMME

In short, the study approach followed by the Consultants, entailed the following steps:

Activity	Description and Purpose
Pre-Application	
Preparation of a preliminary stakeholder database	A preliminary database has been compiled of authorities (local and provincial), Non-Governmental Organisations, land users and other key stakeholders (refer to Appendix E4). This database of registered I&APs will be maintained and updated during the ongoing BA process.
Preparation and Distribution of a Background Information Document (BID)	On 10/03/2021 BIDs and registration forms were distributed via email to all I&APs on the database. See Appendix E2b for proof of written submissions. The BID provides an introduction to the Project and the BA process. Due date for comment was 14/04/2021. See Appendix E2a for the BID and Registration form.
Advertisement of the Project and Erection of Site Notices	The Project was advertised on 10/03/2021 in the newspaper, Mpumalanga News. See proof of notice in Appendix E1a. A Site notice has been placed at the following locations on 29/03/2021: <ul style="list-style-type: none"> At the entrance to Tekwane Citrus Estate At the crossing of the power line with the Msogwaba – Tekwane North tar road. See proof of placement in Appendix E1b.
Development of an Initial Comments and Response Report	All comments received during the initial consultation period were recorded in a Comments and Responses Report. See included in Appendix E6.
BA Phase	
Release of draft Basic Assessment Report for Public Comment	The draft BA Report was released for the required 30-day public comment period: 10/05/2021 to 14/06/2021. (This constitutes 30 days). Notifications were sent to all stakeholders on the database and included details of how to engage in providing comment. The report was submitted to all I&APs and electronic copies could be downloaded with a link from the Setala website. Proof attached as Appendix E2c.
Development of a Comments and Response Report	All comments received were recorded into a Comments and Response Report. See attached as Appendix E6.
Public Open Day	Engagements to replace the public meeting, to be held virtual via teams/zoom, telephone conversations, text messages etc. All comments received, along with responses to be included in the final BAR.
Submission of final Basic Assessment Report to Environmental Authority	Subsequently the final BAR to be submitted to DFFE. The final BAR to include all concerns raised to the DBAR, and the responses thereto.
Environmental Decision	
Notification of Environmental Decision	I&APs will be notified of the Environmental Decision and the statutory appeal period.

22 IMPACT ASSESSMENT

The impacts that may result from the planning and design, construction, operational, decommissioning and closure phases as well as proposed management of identified impacts and proposed mitigation measures have been addressed in this Basic Assessment Report.

The assessment of impacts adheres to the minimum requirements in the EIA Regulations, 2014, and took applicable official guidelines into account. The issues raised by interested and affected parties were also addressed in the assessment of impacts, as well as the impacts of not implementing the activity.

The potential impacts of the proposed development were identified through a desktop study, a site visit, specialist studies and comments received during the public participation process. It is evident that the biggest impact of the project on the environment is expected to occur during the construction phase. It is expected that with the proposed mitigation of impacts and the implementation of the Environmental Management Programme, the expected negative impact could be mitigated to acceptable measures.

METHODOLOGY UTILISED IN THE RATING OF SIGNIFICANCE OF IMPACTS

The potential environmental impacts associated with the project will be evaluated according to its nature, extent, duration, intensity, probability and significance of the impacts, whereby:

- Nature:** A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
- Extent:** The area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact. For example, high at a local scale, but low at a regional scale.
- Duration:** Indicates what the lifetime of the impact will be.
- Intensity:** Describes whether an impact is destructive or benign.
- Probability:** Describes the likelihood of an impact actually occurring; and
- Cumulative:** In relation to an activity, means the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area.

Table 25: Criteria to be used for rating of impacts

Criteria	Description			
Extent	National (4) The whole of South Africa	Regional (3) Provincial and parts of neighbouring provinces	Local (2) Within a radius of 2 km of the construction site	Site (1) Within the construction site
Duration	Permanent (4) Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	Long-term (3) The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter. The only class of impact which will be non-transitory	Medium-term (2) The impact will last for the period of the construction phase, where after it will be entirely negated	Short-term (1) The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
Intensity	Very High (4) Natural, cultural and social functions and processes are altered to extent that they permanently cease	High (3) Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Moderate (2) Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Low (1) Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Probability of occurrence	Definite (4) Impact will certainly occur	Highly Probable (3) Most likely that the impact will occur	Possible (2) The impact may occur	Improbable (1) Likelihood of the impact materialising is very low

Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The total number of points scored for each impact indicates the level of significance of the impact.

Table 26: Criteria for the rating of classified impacts

Low impact (4 - 6 points)	A low impact has no permanent impact of significance. Mitigation measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
Medium impact (7 - 9 points)	Mitigation is possible with additional design and construction inputs.
High impact (10 - 12 points)	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
Very high impact (13 - 20 points)	Permanent and important impacts. The design of the site may be affected. Intensive remediation is needed during construction and/or operational phases. Any activity which results in a "very high impact" is likely to be a fatal flaw.
Status	Denotes the perceived effect of the impact on the affected area.
Positive (+)	Beneficial impact.
Negative (-)	Deleterious or adverse impact.
Neutral (/)	Impact is neither beneficial nor adverse.

It is important to note that the status of an impact is assigned based on the status quo – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.

1 PLANNING AND DESIGN PHASE

The potential impacts, significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the planning phase for the various alternatives of the proposed development.

ALTERNATIVE 1 (PROPOSAL)				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
Impact on the Natural Habitat Design Insensitive design of the power line routes can cause a negative impact on the natural habitat of not only the site itself, but also on the surrounding natural environment. The context of the development site/route corridor within the macro area in terms of conservation areas also plays a major role when suitable areas for development are being considered. The development site/route corridor (or parts thereof) could form part of important ecological corridors and such corridors could be destroyed if the functioning	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Site-specific measures in terms of biodiversity as identified by Johannes Maree (Tel 082 564 1211), must be included in the contract with the Contractor and implemented by the Contractor during the construction phase. The proposed Powerline Route and Substation Alternative is Alternative 1, due to slightly lower impacts. 	NEGATIVE LOW	LOW

thereof is not being supported by the development proposal. <u>The development site</u> The most sensitive areas in the study area 'High Sensitivity' are the untouched / undeveloped rocky granite hills and koppies (outcrops), and the small streams / drainage lines. The medium sensitive areas tend to be the fair to moderately degraded bushveld. There are also protected trees present in some of these bushveld (medium sensitive) areas. The ecological impacts of the two power line route alternatives ,in the northern half of the routes are similar. However, in the southern half, Alternative 2 runs directly over the top of a rocky outcrop where Alternative 1 skirts it. There is also a second rocky outcrop / rocky hill that Alternative 2 would have greater impact on. Therefore, although the impacts are similar, those of Alternative 2 are still slightly higher.				
INDIRECT IMPACTS				
No indirect impacts were identified during the planning and design phase.				
CUMULATIVE IMPACTS				
The impacts of Route Alternatives 1 and 2 are similar, however those of Alternative 2 are still slightly higher and each impact, however slight, still results in an increase in the cumulative negative impacts.				
ALTERNATIVE 2				
DIRECT IMPACTS				
Impact on the Natural Habitat Impacts as described under Proposal above are applicable to Alternative. Insensitive design of the power line route can cause a negative impact on the natural habitat of not only the site itself, but also on the surrounding natural environment. <u>The development site</u> Tekwane North Substation site Alternative 1 is more disturbed with fewer trees present. The topography of Alternative 2 is also steeper, which also creates other aspects such as erosion, etc. The southern tip of Alternative 2 is within the	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Site-specific measures in terms of biodiversity as identified by Johannes Maree (Tel 082 564 1211), must be included in the contract with the Contractor and implemented by the Contractor during the construction phase. 	NEGATIVE MEDIUM	MEDIUM

extent of a drainage line / small stream and will have to either be moved north and east. For this reason it is recommended that Tekwane North Substation site Alternative 1 be used.				
INDIRECT IMPACTS				
No indirect impacts were identified during the planning and design phase.				
CUMULATIVE IMPACTS				
The impacts of Route Alternatives 1 and 2 are similar, however those of Alternative 2 are still slightly higher and each impact, however slight, still results in an increase in the cumulative negative impacts..				

NO GO ALTERNATIVE				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
No direct impacts were identified during the planning and design phase.				
INDIRECT IMPACTS				
No indirect impacts were identified during the planning and design phase.				
CUMULATIVE IMPACTS				
No cumulative impacts were identified during the planning and design phase.				

2 CONSTRUCTION PHASE

ALTERNATIVE 1 (PROPOSAL)				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
Impact on the vegetation This impact is associated with disturbance to and/or destruction of the flora component. During construction the activities could cause a negative impact where insensitive clearing for construction and access purposes, etc. is required. Insensitive clearing can cause the destruction of habitat. Not only does vegetation	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Detail mitigation measures are stipulated in the EMPr and include the following: Ensure as small a footprint as possible during the construction phase. All hazardous materials inter alia paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the natural environment and especially the water environment. All excess materials brought onto site for construction to be removed after 	NEGATIVE MEDIUM	LOW

<p>removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. Insensitive vegetation clearance can also cause erosion.</p> <p>Pressure on the natural environment will occur as a result of an influx of labourers into the area that could involve the collection of firewood and medicinal plants, as well as uncontrolled veld fires.</p> <p><u>The development site</u></p> <p>The most sensitive areas in the study area with 'High Sensitivity' are the untouched / undeveloped rocky granite hills and koppies (outcrops), and the small streams / drainage lines. The medium sensitive areas tend to be the fair to moderately degraded bushveld. There are also protected trees present in some of these bushveld (medium sensitive) areas.</p>		<p>construction, but as part of the construction phase.</p> <ul style="list-style-type: none"> • Proper rubbish/waste bins to be provided. These to be emptied weekly and the waste to be removed to an official waste disposal site. • Rehabilitation plan for disturbed temporary set up areas to be compiled and implemented as part of the construction phase. • Special attention must be given to the rehabilitation of temporary construction and set up areas. • Re-seeding of bare areas with local indigenous grasses to be part of the rehabilitation plan. No exotic species to be used for rehabilitation. • Only existing gravel / sand roads to be used by heavy vehicles during the construction phase. • Access roads to be maintained at all times. • There are three protected tree species in the study area (Breonadia salicina, Pterocarpus angolensis and Sclerocarya birrea). It is fairly likely that some of these trees will need to be removed / destroyed. A tree permit will be required. • No RDL or ODL plants will be destroyed. Any directly within the pole position must be lifted and relocated to a nearby, similar habitat. 		
<p>Impacts on avifauna</p> <p>Disturbance Collisions Electrocutions</p> <p><u>The development site</u></p> <p>The study site is not within any priority areas, including Important Birds Areas (IBAs). There are also no protected areas within a 5km radius of the study site.</p> <p>There are no large rivers or streams in the study area. However, there are a few small drainage lines and small seasonal streams.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> • A steel mono-pole (structure) to be used for the new 132kV line, that reduces bird collisions and electrocutions. • Bird Flight Diverters (BFDs) must be installed in the areas indicated within the report. These areas include high-risk bird sensitive areas such as watercourse crossings and rocky ridges / hilltops where there is pristine bushveld, along with the elevated power line which creates potential collisions / bird-strikes. • The Bird Flight Diverters (BFDs) must be placed across the demarcated areas of the powerline along the earth wire at 5m intervals, alternating black and white. • Each monopole must be fitted with bird perches on the top. This helps to draw large birds (eg. Vultures) away from the dangerous / risky insulators that can result in electrocutions. • Eskom will use the latest structure designs that further help reduce bird collisions and electrocutions. • No interaction is allowed with any birds, even common species. • Should a nest be found during the construction phase, work in that particular spot must be halted and a 	<p>NEGATIVE LOW</p>	<p>LOW</p>

		<p>bird specialist consulted. Any nesting sites found should be cordoned off with tape and signs and declared a 'no-go' zone.</p> <ul style="list-style-type: none"> If the nest is within the actual servitude it might be able to be relocated, depending on the species and the advice from the bird specialist. 		
<p>Impacts on fauna</p> <ul style="list-style-type: none"> Noise and vibration during construction Loss of habitat <p><u>The Development site</u> No priority faunal species (which includes red data species) were encountered during field investigations</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). No poaching of wildlife or selling of firewood will be allowed. No animals or birds may be fed, disturbed, hunted or trapped. 	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p>Impact on Water Sources</p> <p>During construction, the risk of pollution of surface and groundwater can generally be related to diesel, oil and concrete spills that may result in a change in water quality with the associated negative impact on humans and the natural habitat. Groundwater pollution during the construction phase is also associated with poor construction techniques. Diesel, oil and lubricant spills are the main concern in respect of water pollution during construction together with organic pollution caused by inadequately managed facilities at the work sites.</p> <p><u>The development site</u> There are only a few small watercourses within the study area. The power line can easily jump these. There are no watercourses in the proposed substation sites.</p>	<p>NEGATIVE HIGH</p>	<ul style="list-style-type: none"> Mitigation measures in the Environmental Management Programme include measures to ensure acceptable construction practices to minimise or avoid the risk of contamination of water sources. These include: <p><u>Construction Site</u></p> <ul style="list-style-type: none"> No heavy vehicles are allowed to drive through watercourses, unless on existing gravel and farm roads. 32m Buffer Zones (No-Go Zones) from the edge of all watercourses must be implemented and strictly enforced. No power line poles / pylons may be planted within these buffer zones. No temporary facilities or portable toilets to be setup within 100m of any watercourse and associated riparian zone and floodplains, including streams, drainage lines and wetlands. No temporary accommodation or temporary storage facilities may be setup within 100m of the any watercourse. No excess excavated soils may be stockpiled within natural grassland areas. Ensure as small a footprint as possible during the construction phase. All hazardous materials inter alia paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the natural environment and especially the water environment. During and after construction, stormwater control measures should be implemented especially around stockpiled soil, excavated areas, trenches etc. so that export of soil into any watercourse is avoided. <p><u>Diesel, hydraulic fluid and lubricants</u></p> <ul style="list-style-type: none"> Minimise on-site storage of petroleum products; Ensure measures to contain spills readily available on site (spill kits). 	<p>NEGATIVE MEDIUM</p>	<p>LOW</p>

		<ul style="list-style-type: none"> • All petrochemical leaks and spills must be appropriately contained and disposed of at a licensed waste disposal site. <p><u>Construction Vehicles</u></p> <ul style="list-style-type: none"> • All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. No repairs may be undertaken beyond the contractor laydown area. • Should any transfer of vehicle fuel take place on site, it is important to demarcate a specific area for this purpose. This area should be covered with an impermeable layer to prevent any penetration of fuel and oil spillage into the soil. The area could also be sloped towards an oil trap or sump to ease collection of spilled substances. • All construction vehicles should be serviced on a regular basis to minimise the risk of oil spillage on site. • Servicing of vehicles or equipment must take place off-site at appropriate workshop facilities. • When not in use, construction vehicles must be parked at the hardpark, with 'impermeable layers', at the workshops to prevent leaks and spills from penetrating the substrate. <p><u>Construction site domestic waste and sewage</u></p> <ul style="list-style-type: none"> • Deposit solid waste in containers and dispose at authorised waste disposal sites regularly or as per the Waste Management Plan. • Dispose of liquid waste (grey water) with sewerage. • Temporary install appropriate ablution facilities. • Preferably utilise onsite ablution facilities or chemical toilets. • <u>Construction site inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc)</u> • Ensure compliance with stringent daily clean up requirements on site. • Dispose at authorised waste disposal sites. <p><u>Construction site hazardous waste</u></p> <ul style="list-style-type: none"> • All hazardous substances must be stored on an impervious surface in a designated bunded area, able to contain 110% of the total volume of materials stored at any given time. • Material safety data sheets (MSDSs) are to be clearly displayed for all hazardous materials. • The integrity of the impervious surface and bunded area must be inspected regularly and any maintenance work conducted must be recorded in a maintenance report. 		
--	--	---	--	--

		<ul style="list-style-type: none"> • Employees should be provided with absorbent spill kits and disposal containers to handle spillages. • Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages. • Employees should record and report any spillages to the responsible person. • An Emergency Preparedness and Response Plan will be developed and implemented as part of the existing emergency response plan, should and incident occur. • Access to storage areas on site must be restricted to authorised employees only. • Contractors will be held liable for any environmental damages caused by spillages. 		
Topographical Impacts Alteration of topography due to stockpiling of soil, building material and debris and waste material on site.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • All stockpiles must be restricted to designated areas and are not to exceed a height of 2 metres. • Stockpiles created during the construction phase are not to remain during the operational phase. • The contractor must be limited to clearly defined access routes to ensure that sensitive and undisturbed areas are not disturbed. 	NEGATIVE LOW	LOW
Impact of erosion Unnecessary clearing of vegetation can result in exposed soil prone to erosive conditions. Insufficient soil coverage after placing of topsoil especially during construction where large surface areas are applicable could also cause erosion. To cause the loss of soil by erosion is an offence under the law. <u>The development site</u> The gradient of the study site varies considerably across the length of the study site (proposed power line route of 5km). The Tekwane North Substation (in the north of the study site) is at an elevation of about 825m, while the Entokozweni Substation (in the south of the study site) is at an elevation of about 550m. The overall, general downward slope is from north to south.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • A combination of erosion prevention principles is discussed in detail in the EMPr. These include the use of mulch / fertiliser, matting, vegetation, retaining walls, topsoil coverage, diversion channels and berms, etc. • Other factors which should be taken into account during the construction phase are the following: • Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided. • Land disturbance must be minimized in order to prevent erosion and run-off - this includes leaving exposed soils open for a prolonged period of time. As soon as vegetation is cleared (including alien) the area must be re-vegetated. • Large exposed areas during the construction phases should be limited. Where possible areas earmarked for construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas. • The total area of exposed soil must be reduced during the rainy season. • Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction must be implemented. 	NEGATIVE LOW	LOW

		<ul style="list-style-type: none"> Rehabilitation plan for disturbed temporary set up areas to be compiled and implemented as part of the construction phase. Special attention must be given to the rehabilitation of temporary construction and set up areas. Re-seeding of bare areas with local indigenous grasses to be part of the rehabilitation plan. No exotic species to be used for rehabilitation. 		
Soils Impacts Removal and compaction of soil during construction activities. Erosion, degradation and loss of topsoil due to construction activities as well as surface and stormwater run-off.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Strip topsoil prior to any construction activities. Reuse topsoil to rehabilitate disturbed areas. Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads. Minimise the clearance of vegetation to avoid exposure of soil. Protect areas susceptible to erosion with mulch or a suitable alternative. Implement the appropriate topsoil and stormwater runoff control management measures as per the EMPr to prevent the loss of topsoil. Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off. 	NEGATIVE LOW	LOW
Air Quality Impacts Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing, general construction.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Dust must be suppressed on the construction site and during the transportation of material during dry periods by the regular application of water. Water used for this purpose must be used in quantities that will not result in the generation of run-off. Loads could be covered to avoid loss of material in transport, especially if material is transported off site. Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary. A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas. During the transfer of materials, drop heights should be minimised to control the dispersion of mater being transferred. The height of all stockpiles on site should be a maximum of 2m. Use of dust retardant road surfacing if required due to the exceedance of Air Quality Guidelines. 	NEGATIVE LOW	LOW
Impacts associated with construction activities such as noise, and safety The negative impact of noise, generally associated with construction activities, are	NEGATIVE MEDIUM	<u>Noise mitigation measures</u> <ul style="list-style-type: none"> All construction activities should be undertaken according to daylight working hours between the hours of 07:00 – 17:00 on weekdays and 7:00 – 17:00 on Saturdays. 	NEGATIVE MEDIUM	LOW

temporary, occurring mostly during the construction phase. In terms of safety, it should be noted that the project involves deep excavations and open trenches. Excavations and open trenches can act as a trap for snakes, small mammals and lizards.		<ul style="list-style-type: none"> Construction activities may be undertaken on Sundays in cases of emergencies. Provide all equipment with standard silencers. Maintain silencer units in vehicles and equipment in good working order. All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability. Construction staff working in area where the 8-hour ambient noise levels exceed 85 dBA must have the appropriate Personal Protective Equipment (PPE). All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993). <p><u>Safety mitigation measures</u></p> <ul style="list-style-type: none"> The area affected by construction must be fenced prior to any activities taking place. All excavated areas must be clearly marked and barrier tape must be placed around them for safety purposes. A Fire Management Plan has to be identified during the pre-construction phase and must be implemented throughout the construction and operation phases of the development. 		
Traffic (construction vehicles) The construction phase is likely to generate additional traffic in terms of construction vehicles and heavy vehicles delivering materials to the site.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> The heavy construction vehicles should avoid the local roads during peak traffic times and large deliveries should also be scheduled outside the peak traffic times. Signs should be erected in the vicinity of the site. Construction vehicles are to avoid main roads during peak traffic hours. All vehicles entering the Site are to be roadworthy. When using heavy or large vehicles / equipment, "spotters" are to be present to assist the driver with his blind spots. Any incident or damage to a vehicle must be reported immediately. 	NEGATIVE MEDIUM	LOW
Impact of Labourers An uncontrolled influx of labourers with resulting increase in crime and squatting would place pressure on the natural environment (placement of snares, removal of trees for firewood, careless waste disposal, etc.). This could be severe, resulting in permanent damage to the environment if not mitigated properly. <u>The development site</u>	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Mitigation measures to counter impact on the natural environment and limit potential for crime during the construction phase should include specifications in terms of control of construction workers (i.e. provision of toilet and cooking facilities, provision of either accommodation facilities or transport facilities, implementation of Environmental Educational Programmes, etc.). Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers 	NEGATIVE LOW	LOW

A small number of construction workers will be on site. A large workforce is thus not expected. Even if all the required labourers (highly skilled to unskilled) are sourced from outside the study area (worst case scenario) it is not anticipated that the relatively small construction workforce will have an impact on the population size and density of the local communities within the study area.		<p>transported to and from existing neighbouring towns) or a separate fenced and controlled area where proper accommodation and relevant facilities are provided.</p> <ul style="list-style-type: none"> • No temporary accommodation or temporary storage facilities may be setup within 100m of the any watercourse. • Part of the adjudication process for the successful contractor to undertake the civil works must be the use of casual and unskilled labour to stimulate local job creation through the use of labour intensive methods where possible. • If possible all labour should be sourced locally. • Contractors and their families may not stay on site. • No informal settlements will be allowed. 		
Safety Public safety during construction.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • Members of the public adjacent to the construction site should be notified of construction activities in order to limit unnecessary disturbance or interference. • Construction activities will be undertaken during daylight hours and only on Sundays in cases of emergency. 	NEGATIVE LOW	LOW
Safety Construction staff safety during construction.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction. • All construction staff must have the appropriate PPE. • The construction staff handling chemicals or hazardous materials must be trained in the use of the substances and the environmental, health and safety consequences of incidents. • Report and record any environmental, health and safety incidents to the responsible person. 	NEGATIVE MEDIUM	LOW
Impact on Cultural Heritage Resources Alternative 1 does not impact on any known heritage resources and is therefore the preferred alternative as Alternative 2 traverses several cemeteries. There is always a probability that additional archaeological resources might be identified during excavations.	NEGATIVE LOW	<ul style="list-style-type: none"> • A 'Chance find Procedure' should be followed: <ul style="list-style-type: none"> ➤ Upon finding any archaeological or historical material all work at the affected area must cease. ➤ The area should be demarcated in order to prevent any further work there until an investigation has been completed. ➤ An archaeologist should be contacted immediately to provide advice on the matter. ➤ Should it be a minor issue, the archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit. ➤ SAHRA's APM Unit may also be notified. ➤ If needed the necessary permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist. 	NEGATIVE LOW	LOW

		<ul style="list-style-type: none"> ➤ The removal of such archaeological material will be done by the archaeologist in lieu of the approval given by SAHRA, including any conditions stipulated by the latter. ➤ Work on site will only continue after the archaeologist/ SAHRA has agreed to such a matter. 		
Existing services and infrastructure Damage to the existing services and infrastructure during the construction phase and disruptions in services (i.e. Telkom lines, electricity) during the construction phase.	NEGATIVE LOW	<ul style="list-style-type: none"> • Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place. 	NEGATIVE LOW	LOW
Waste Management <u>Builder's and domestic waste</u> The construction phase will create small quantities of contractor's and domestic waste to be accommodated by local legal landfill sites.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • Develop a central waste temporary holding site to be used during construction. This site should comply with the following: • Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.; • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste. • These areas shall be predetermined and located in areas that is already disturbed. • These areas shall not be in close proximity of any watercourse. 	NEGATIVE LOW	LOW
<u>Sewage waste</u> Generation and disposal of sewage waste of temporary construction toilets.	NEGATIVE MEDIUM	<ul style="list-style-type: none"> • On-site chemical toilets will be provided for domestic purposes during construction phase. • The contractors will be responsible for the maintenance of the chemical toilets. • No temporary facilities or portable toilets to be setup within 50m of any watercourse. • No French drain systems may be installed. • Should any spills or incidents occur; the material will be cleaned up immediately and disposed off appropriately. • All incidents must be reported to the responsible site officer as soon as it occurs. 	NEGATIVE LOW	LOW
Economic impacts Positive economic impacts are anticipated. The impact on employment would be positive, and although the impact is expected to be small; any contribution to more	POSITIVE HIGH	<ul style="list-style-type: none"> • Employment opportunities will be generated. • All labour (skilled and unskilled) and contractors should be sourced locally where possible. • A labour and recruitment policy must be developed, displayed and implemented by the contractor. 		

employment is an achievement in South Africa.		<ul style="list-style-type: none"> Recruitment at the construction site will not be allowed. Where possible, labour intensive practices (as opposed to mechanised) should be practiced. The principles of equality, BEE, gender equality and non-discrimination will be implemented. 		
INDIRECT IMPACTS				
No indirect impacts were identified during the construction phase.				
CUMULATIVE IMPACTS				
Visual Impact The development of the site would contribute to the cumulative effects of the gradual transformation of the area from an area with part rural landscape components to an area dominated by infrastructure. <u>Development site</u> It is also important to take into consideration that, for sections of the power line route, the power line servitude runs along existing roads. The route also traverses mostly built up areas. In other words, the power line servitude will be mostly within or next to disturbed areas.		Project should adhere to the stipulated mitigation measures to limit impact to the natural habitat, to surface water, erosion etc.		

ALTERNATIVE 2				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
Impacts as described under Proposal above are applicable to Alternative 2.				
Impact on Cultural Heritage Resources Alternative 2 traverses several cemeteries that is rapidly expanding and could have an irreversible impact on these features especially on the intangible aspects associated with burial sites. Alternative 1 was then sited in the field in order to avoid the heritage sensitivities and therefore avoiding know heritage sites limiting the potential impact of this alternative. There is always a probability that additional	NEGATIVE HIGH	<ul style="list-style-type: none"> A 'Chance find Procedure' should be followed: <ul style="list-style-type: none"> ➤ Upon finding any archaeological or historical material all work at the affected area must cease. ➤ The area should be demarcated in order to prevent any further work there until an investigation has been completed. ➤ An archaeologist should be contacted immediately to provide advice on the matter. ➤ Should it be a minor issue, the archaeologist will decide on future action. Depending on the nature of the find, it may include a site visit. ➤ SAHRA's APM Unit may also be notified. 	NEGATIVE HIGH	HIGH

archaeological resources might be identified during excavations.		<ul style="list-style-type: none"> ➤ If needed the necessary permit will be applied for with SAHRA. This will be done in conjunction with the appointed archaeologist. ➤ The removal of such archaeological material will be done by the archaeologist in lieu of the approval given by SAHRA, including any conditions stipulated by the latter. ➤ Work on site will only continue after the archaeologist/ SAHRA has agreed to such a matter. 		
INDIRECT IMPACTS				
No indirect impacts were identified during the construction phase.				
CUMULATIVE IMPACTS				
No cumulative impacts were identified during the construction phase.				

NO GO ALTERNATIVE				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
All the impacts outlined above will not apply to the No-Go alternative as the status quo will apply and the environment will remain as it is currently. However, it is important to note that the benefits associated with the development will also not materialise, and it must be noted that the majority of the impacts identified for the development were mitigated to a negative low or positive impact once the measures for mitigation were applied, indicating that maintaining the status quo is to lose the opportunity of a beneficial development with negligible environmental impacts.				
INDIRECT IMPACTS				
No indirect impacts were identified during the construction phase.				
CUMULATIVE IMPACTS				
No cumulative impacts were identified during the construction phase.				

3 OPERATIONAL PHASE

ALTERNATIVE 1 (PROPOSAL)				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
Impact on the natural habitat The removal of any alien invasive plants, coupled with indigenous re-vegetation in the area of the substation site and the laydown area, as proposed will have a positive effect on the biodiversity of not only the site itself, but also its surrounds.	POSITIVE HIGH	Vegetation guidelines as stipulated in the EMPr must be followed during the operational phase of the project.		
Impact of alien vegetation	POSITIVE HIGH	Removal of alien invasive species or other vegetation and follow-up procedures must be in accordance with the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983). Mechanical control of alien species to be implemented within three (3) months of completion of construction of the power line. Thereafter ever six months. No chemical control (herbicides) to be used in the control of alien plants. All control of weeds to be mechanical in nature. Cleared alien vegetation must not be dumped on adjacent intact vegetation during clearing, but should be temporarily stored in a demarcated area.		
Impact on avifauna	NEGATIVE MEDIUM	<ul style="list-style-type: none"> Maintenance access roads to be limited to car tracks or small gravel roads under the power lines (This does not include existing farm roads or public gravel roads in the area that can be used to access the power line). Access roads to be maintained and any erosion gullies to be rehabilitated as part of the maintenance programme on the power lines. Any dead birds found in the power line servitude to be photographed, position recorded and reported to Eskom. 	NEGATIVE LOW	LOW
Socio-Economic Impact The impact on employment would be positive, and although the impact is expected to be small; any contribution to more employment is an achievement in South Africa. POSITIVE IMPACT	POSITIVE LOW			
INDIRECT IMPACTS				
No indirect impacts were identified during the operational phase.				
CUMULATIVE IMPACTS				

Eskom Entokozweni and Tekwane North substations and 132kV power line

No cumulative impacts were identified during the operational phase.				
---	--	--	--	--

ALTERNATIVE 2				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
Impacts described under Alternative Proposal above are applicable to Alternative 2.				
INDIRECT IMPACTS				
Impacts described under Alternative Proposal above are applicable to Alternative 2.				
CUMULATIVE IMPACTS				
Impacts described under Alternative Proposal above are applicable to Alternative 2.				

NO GO ALTERNATIVE				
DIRECT IMPACTS				
Potential Impacts	Significance Rating	Mitigation Measures	Significance rating of impacts after mitigation	Risk of the impact and mitigation not being implemented
All the impacts outlined above will not apply to the No-Go alternative as the status quo will apply and the environment will remain as it is currently. However, it is important to note that the benefits associated with the electrical infrastructure development will also not materialise, and it must be noted that the majority of the impacts identified for the infrastructure development were mitigated to a negative low or positive impact once the measures for mitigation were applied, indicating that maintaining the status quo is to lose the opportunity of a beneficial infrastructure development with negligible environmental impacts.				
DIRECT IMPACTS				
No indirect impacts were identified during the operational phase.				
CUMULATIVE IMPACTS				
No cumulative impacts were identified during the operational phase.				

4 IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Due to the permanent nature of this development proposal, decommissioning is highly unlikely and decommissioning therefore does not form part of this project proposal.

5 ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, an environmental impact statement will be completed. This will sum up the impact and its alternatives may have on the environment (after the management and mitigation of impacts have been taken into account - with specific reference to types of impact, duration of impacts, likelihood of potential impacts and the significance of impact).

PLANNING & DESIGN PHASE (PROPOSAL)

Impact Description	Intensity	Extent	Duration	Probability it would occur	Significance rating After Mitigation
Impact on Natural Habitat and watercourses	1	2	2	1	Low

CONSTRUCTION PHASE (PROPOSAL)

Impact Description	Intensity	Extent	Duration	Probability it would occur	Significance rating After Mitigation
Impact on Natural Habitat	1	1	2	2	Low
Impact on Water Resources	1	2	2	2	Low
Impact on Avifauna	1	2	1	2	Low
Geology: Stability of structures, stability of excavations	1	1	3	1	Low
Impact on Erosion	2	1	1	2	Low
Impact of Noise, Safety and Dust	2	2	1	1	Low
Traffic Impact	2	2	1	1	Low
Impact of Labourers	2	2	1	1	Low
Impact on Cultural Heritage Resources	1	1	2	1	Low
Existing Services and Infrastructure	1	1	2	1	Low
Waste Management	2	1	1	2	Low
Economic Impacts This will be a POSITIVE impact	3	2	2	3	High

OPERATIONAL PHASE (PROPOSAL)

Impact Description	Intensity	Extent	Duration	Probability Probability it would occur	Significance rating After Mitigation
Impact on Natural Habitat This will be a POSITIVE impact	2	2	3	3	High
Impact on Avifauna	1	2	1	2	Low

Impact on Alien vegetation This will be a POSITIVE impact	2	2	3	3	High
Economic Impacts This will be a POSITIVE impact	3	2	2	3	High

NO-GO (Compulsory)

All the impacts outlined above will not apply to the No-Go alternative as the status quo will apply and the environment will remain as it is currently. However, it is important to note that the benefits associated with the development will also not materialise, and it must be noted that the majority of the impacts identified for the development were mitigated to a negative low or positive impact once the measures for mitigation were applied, indicating that maintaining the status quo is to lose the opportunity of a beneficial development with negligible environmental impacts.

6 IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

The significance of impacts of the proposal and alternative(s), and reasons for selecting the proposal or preferred alternative are as follows:

Entokozweni - Tekwane North Power line

The project and related activities will have limited potentially negative impacts on the natural environment. The impacts will be at a very localised level (Study Site). The nature of the project is also known to have low levels of negative impacts on the natural environment. The overall footprint is small with poles every few hundred metres and bush clearing of approximately 8 wide under the wires. With the implementation of mitigating measures and general standards and procedures for power line construction, the potential impacts can be reduced slightly and contained to the specific study site. Most of the negative impacts will be short-term (during the construction phase), with the only measurable long-term potential impacts being those of potential bird electrocutions and collisions.

Route alternative recommendations: Ecological

Two power line route / servitude alternatives were investigated. Due to the spatial constraints for the servitude the alternatives follow the same corridor in certain areas. The ecological impacts of the two alternatives in the northern half of the routes are similar. However, in the southern half, Alternative 2 runs directly over the top of a rocky outcrop where Alternative 1 skirts it. There is also a second rocky outcrop / rocky hill that Alternative 2 would have greater impact on. Therefore, although the impacts are similar, those of Alternative 2 are still slightly higher and each impact, however slight, still results in an increase in the cumulative negative impacts. For these reasons the recommended route alternative is Alternative 1.

Route alternative recommendations: Avifauna

Route Alternative 1 is less sensitive in terms of Avifaunal Impacts. The two power line route alternatives are very similar in most aspects, but Alternative 2 does traverse more hilltops and rocky bushveld areas, especially in the southern half of the route. In this area Alternative 1 runs further distances along and parallel to existing roads. Erecting a power line along an existing road lowers the potential for bird impacts and collisions than the same line in open grassland or bushveld. The road is also already a disturbance within the natural environment and it is always preferable to keep disturbances within the same area. For these reasons the recommended route alternative is Alternative 1.

Route alternative recommendations: Heritage

Alternative 1 is an alignment sited in the field during the current site visit conducted by HCAC to avoid heritage sensitive areas, mostly being large cemeteries. Alternative 2 has heritage sensitive areas, inter alia cemeteries, an Iron Age site and a homestead. Four heritage features were recorded consisting of cemeteries that are rapidly expanding. A single find spot was recorded indicating use of the wider landscape by Stone Age people and Iron Age communities. Alternative 1 (does not impact on any known heritage resources and is therefore the preferred alternative, as Alternative 2 traverses several cemeteries.

In summary, taking the ecological, avifauna and heritage sensitivities into account, the recommended route alternative is Alternative 1.

Tekwane North Substation

Substation alternative recommendations: Ecology

Two alternative sites were investigated for the proposed Tekwane North Substation. Although the sites are fairly close there are some differences and similarities. Both sites are mostly disturbed areas from ploughing and cultivated lands. Both are on top of a hilly area with some nearby open bushveld and drainage lines. However, Alternative 1 is more disturbed with fewer trees present. The topography of Alternative 2 is also steeper, which also creates other aspects such as erosion, etc. The southern tip of Alternative 2 is within the extent of a drainage line / small stream and will have to either be moved north and east.

In terms of the natural ecology the recommended substation site is: Alternative 1

Substation alternative recommendations: Avifauna

In terms of impacts the Alternative 1 is more degraded than Alternative 2. However, both sites are fairly degraded by years of cultivated farmlands. Site 2 has more trees and bushveld in the immediate vicinity and the southern boundary is within the edge of a small stream drainage line Therefore, Alternative 1 is the preferred alternative in terms of avifauna and biodiversity in general.

Substation alternative recommendations: Heritage

The Alternative 1 site as well as the Alternative 2 site do not impact on any known heritage resources.

In terms of heritage resources either site alternative may be used.

Proposal

The Preferred Route Alternative 1 and Substation site Alternative 1 are thus recommended for the proposed project.

23 RECOMMENDATION OF PRACTITIONER

The majority of the negative environmental impacts will be experienced during the construction phase. The majority of these impacts will have a LOW significance. It is envisaged that these impacts can be easily mitigated and satisfactorily managed. The management of the impacts identified in the BAR for the construction and operational phases, are outlined in the technical specialist report recommendations and the EMPr.

It is the opinion of Setala Environmental that there are presently no environmental impacts emanating from the proposed activity that cannot be adequately managed. The management of the negative impacts will require the implementation of the necessary mitigatory measures detailed in the Environmental Management Programme (EMPr, refer to Appendix F) of this report.

Based on the assumption that the mitigation measures will be effectively implemented for the proposed project and its associated infrastructure and that no fatal flaws have been identified to date, it is the opinion of the EAP that this activity should be authorised to proceed to the final stages of decision making.

24 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR)

An Environmental Management Programme was prepared to detail a plan of action to ensure that recommendations for preventing the negative environmental impacts (and where possible improving the environment) are implemented during the life-cycle of the project. The applicant has to sign and implement a Generic EMPr approved by the DFFE for both the substations and the overhead lines. These Generic EMPr templates are available in soft copies and in Appendix F. In addition, refer to Part C: Site Specific Environmental Attributes of the EMPrs.

25 THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

As per the Appendix 1(3)(1)(q) of the NEMA EIA Regulations 2014, as amended, the period for which the environmental authorisation is required, is five (5) years and the activity is expected to be concluded within 2 years from the date of authorisation.

26 CONCLUSION

In summary the following is recommended for authorisation:

This EIA investigated a 200m corridor to accommodate any future deviation of the power lines. The EIA will seek to authorise the total corridor. The wider area that was investigated will allow future potential amendments to the EA should it be necessary (at a later stage). Should small changes be done to the route alignment after authorisation it will not be considered crucial and will not warrant a new application.

The EIA recommends Alternative 1 for construction. The Preferred Route Alternative 1 and Substation Site Alternative 1 are recommended for construction of the proposed project.
