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## ESKOM KUDU – ELDERS 132KV POWER LINE AND ELDERS SUBSTATION

DFFE REF: 2022-06-0014

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## Eskom Kudu – Elders 132kV power line and Elders Substation

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## 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
DFFE	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
EMPr	Environmental Management Program
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

Setala Environmental (Pty) Ltd has been appointed as the independent environmental assessment practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed bulk electricity supply infrastructure. The applicant is Eskom Holdings SOC LTD.

An application for authorisation of the project is submitted to the National Department of Forestry, Fisheries and the 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 when undertaking a Basic Assessment Process.

Eskom Holdings SOC Ltd is in the process of planning the construction and development of a new 132kV Power Line between the existing Kudu Substation (at Komati Power Station) and the proposed new Elders Substation. The Elders Substation forms part of the project.



Figure 1: Partial view of Komati Power Station with Kudu Substation to the left

This Basic Assessment will provide information about the proposed Eskom 132kV overhead power line and the proposed Elders Substation. 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 Forestry, Fisheries and the 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 to make a decision.

## 3 PROJECT LOCALITY

The proposed project is located ± 34kms to the southeast of Emalahleni and ± 24km north of Bethal. The project is proposed on Komati Power Station 56-IS Remainder; Goedehoop 46-IS R/3, Portions 8/3, 2, Re, 4; Kleinfontein 49-IS Portions 10/1, RE/4, 12/4, 8/4; in the jurisdiction of Steve Tshwete Local Municipality (Nkangala DM) and Schoonvlei 52-IS Portion 2, Middelkraal 50-IS 8/3, R/3 in Govan Mbeki Local Municipality (Gert Sibande DM), Mpumalanga Province.

The proposed project is set out in the Location Map below. (Refer to Appendix A for Site Location maps)

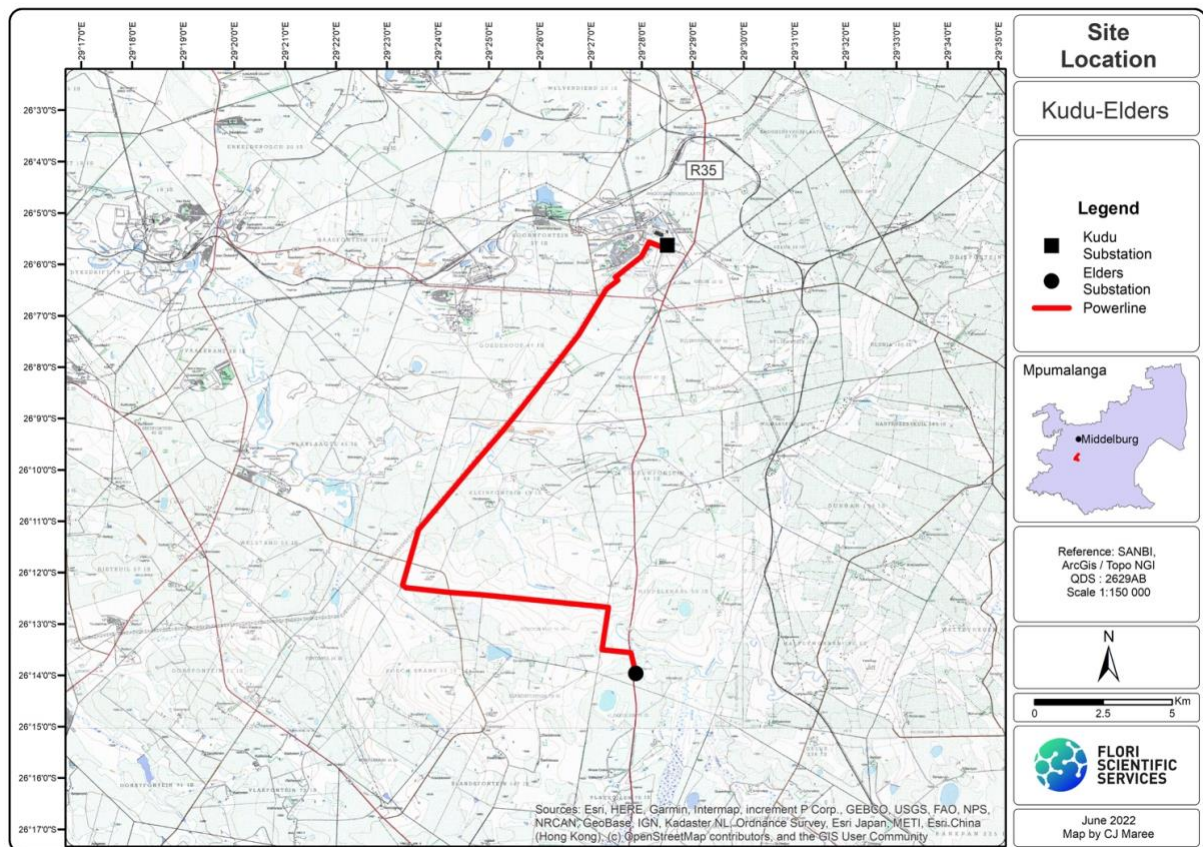


Figure 2: Site Location

The proposed Kudu-Elders 132kV power line is approximately 26km in length. The existing Kudu Substation is situated on the property of the Komati Power Station.

Below are some of the main coordinates for the project:

- Existing Kudu Substation: 26° 5'37.81"S; 29°28'30.19"E.
- Proposed Elders Substation: 26°13'57.96"S; 29°27'53.17"E.
- Komati Power Station: 26° 5'25.85"S; 29°28'20.48"E.
- Quarter Degree Square (QDS): 2629AB.
- Quaternary Drainage Area (QDA): B11A & B11B.



Figure 3: Site location (Google Earth)

#### 4 PROPERTY DESCRIPTION

The project is located on Komati Power Station 56-IS Remainder; Goedehoop 46-IS R/3, Portions 8/3, 2, Re, 4; Kleifontein 49-IS Portions 10/1, RE/4, 12/4, 8/4; in the jurisdiction of Steve Tshwete Local Municipality (Nkangala DM) and Schoonvlei 52-IS Portion 2, Middelkraal 50-IS 8/3, R/3 in Govan Mbeki Local Municipality (Gert Sibande DM), Mpumalanga Province. Refer to below:

*Refer to Appendix E4b for detailed information on Routes 1 and 2*

<b>Kudu-Elders Route 1</b>				
<b>Item</b>	<b>Property</b>	<b>Ptn</b>	<b>Size</b>	<b>SG code</b>
1	Komati Power Station 56-IS	RE	611,8241	TOIS00000000005600000
2	Goedehoop 46-IS	R/3	396,0727	TOIS00000000004600003
3	Goedehoop 46-IS	8/3	79,1883	TOIS00000000004600008
4	Goedehoop 46-IS	2	475,2753	TOIS00000000004600002
5	Goedehoop 46-IS	RE	310,4787	TOIS00000000004600000
6	Goedehoop 46-IS	4	278,7939	TOIS00000000004600004
7	Kleifontein 49-IS	10/1	211,2779	TOIS00000000004900010
8	Kleifontein 49-IS	RE/4	544,2618	TOIS00000000004900004
9	Kleifontein 49-IS	12/4	274,0902	TOIS00000000004900012
10	Kleifontein 49-IS	8/4	818,3464	TOIS00000000004900008
11	Schoonvlei 52-IS	2	279,1883	TOIS00000000005200002
12	Middelkraal 50-IS	8/3	4,4603	TOIS00000000005000003
13	Middelkraal 50-IS	R/3	252,4993	TOIS00000000005000003

## 5 PROJECT DESCRIPTION

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 kilometers 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.

In the period 2012 to 2014 Eskom's Transmission and Distribution divisions responded to market requests by adopting new policies and procedures which allow private developers to develop and build new Eskom bulk electricity lines and substations which were required for their projects. The rationale behind the adoption of the Self-Build policy was an acknowledgement that private developers should be given the opportunity to save time and cost by using their own resources to develop these projects. Eskom Distribution was the first division within Eskom to adopt a Self-Build Policy - in about 2011/2012.

The principles set out in the Eskom Self-Build policies include the following:

Customers are allowed to execute the following tasks which form part of the typical life cycle of bulk electrical infrastructure projects:

- determine routes for new overhead lines and positions of new substations;
- conduct the EIAs for the new overhead lines and substations;
- negotiate and secure the servitudes for the new overhead lines and substations;
- compile the engineering designs;
- procure and supply the construction materials; and
- construct and commission the new lines and substations.

This application is for bulk electricity supply infrastructure. The proposed infrastructure, the overhead powerline and the substation will remain Eskom's property.

The scope of the project involves the construction of an approximate 26km overhead 132kV power line between the existing Eskom Kudu Substation and the proposed new Elders Substation. The construction of the proposed new Eskom Elders Substation forms part of the scope of the project.

A section of the proposed power line route has been authorised on 24 October 2011, Ref DEAT/EIA/0000159/2011 and Eskom holds a servitude on this portion of the route. Subsequently, an amendment to the above project was authorised on 02 October 2014. DEA Ref 12/12/20/2144. The amendment addressed the alignment of the power line route.

The mentioned existing Eskom servitude constitutes approximately half of the current proposed/preferred route. In the pre-application meeting with DFFE it was advised, for the sake of completeness and to assess all the possible impacts, to assess the route commencing at Komati Power Station (Kudu Substation) up to the proposed Elders Substation as end point.

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

- Construct a ± 26km Kingbird overhead 132kV line outside an urban area from Kudu Substation (at Komati Power Station) to the proposed Elders substation. (Listing Notice 1 Activity 11)
- Construct 2 x 20MVA 132/11kV Elders Substation. (Listing Notice 1 Activity 11)
- Construct Power line structures/ stayed monopole steel poles within 32 meters of a waterbody along the 132kV feeder line and excavate more than 10 cubic metres of soil and rock from a watercourse. (Listing Notice 1 Activity 19)
- Develop access roads of wider than 4 metres to construct the power line in (bb) National Protected Area Expansion Strategy Focus areas and (ee) Critical biodiversity areas. (Listing Notice 3 Activity 4 (bb) & (ee))

**Laydown area**

Part of the scope of work is to identify and construct/establish a temporary laydown area required for the construction phase of the power line.

The laydown area will need to include the following:

- A yard/area where materials such as poles and wires are temporary stored;
- A small mobile site office;
- Toilets;
- Area to park work vehicle;
- Parking area for visitors;
- Containers or other temporary structures for the secure storage of tools, materials such as nuts and bolts, paints, etc.;
- A small security guard hut at the entrance; and
- An access road (permanent or temporary, depending on site location etc.)

The temporary laydown area does not need to be very large, but needs to be secure and fenced. Therefore, a setup within the proposed substation area is ideal.

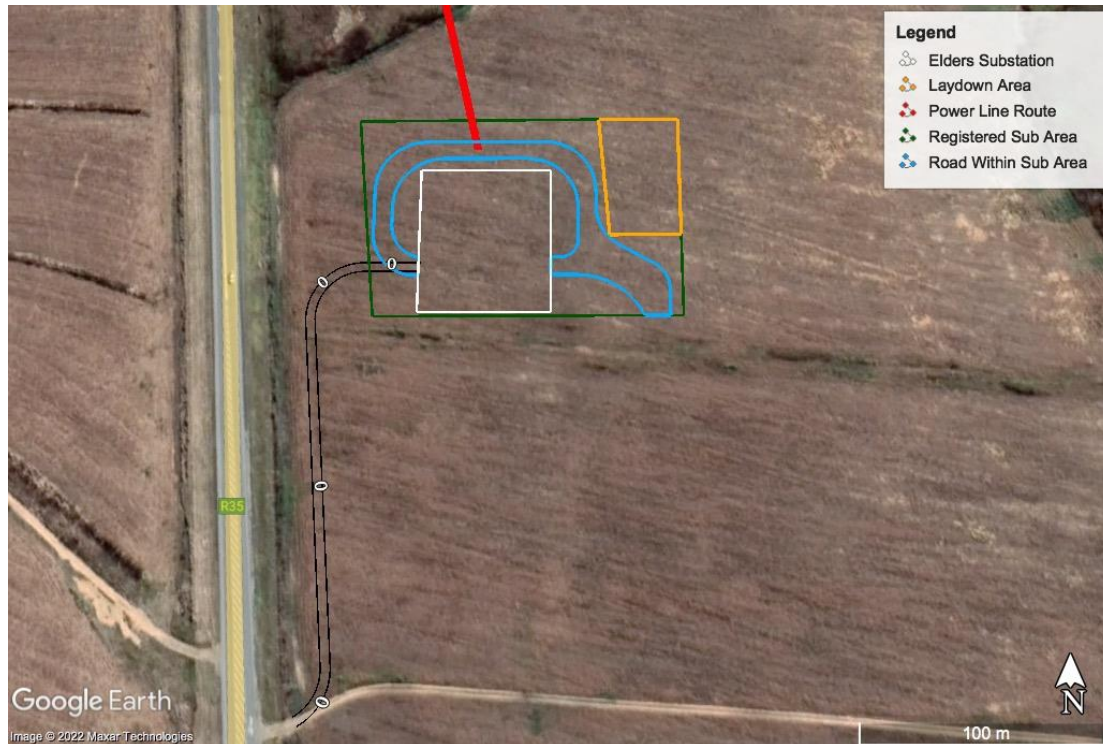


Figure 4: Elders Substation Layout and Temporary Laydown Area

During the construction phase of the power line and use of the laydown area, the access road needs to be maintained. The yard area also needs to be maintained and kept clean. A basic weed control plan needs to be implemented during the construction phase to keep the site free of weeds. Upon completion of the construction phase, the laydown area must be rehabilitated and cleaned up, even though it is within the perimeter of the substation site. All materials and equipment brought on to the site must be removed. The surface area is recontoured if need be. The access road also needs to be repaired where it has been damaged during use by large vehicles, etc.

## 6 COORDINATES OF DEVELOPMENT PROPOSAL

### 1 Kudu – Elders 132kV power line routes

The GPS coordinates of the Kudu – Elders 132kV power line routes are as follows:

#### Preferred Route 1

- Length: 26,019 km.
- Starting Point at Elders substation: 26°13'57.96"S; 29°27'53.17"E.
- Middle Point: 26°10'47.32"S; 29°23'56.19"E.
- End Point at Kudu Substation site: 26° 5'37.81"S; 29°28'30.19"E.

#### Alternative Route 2

- Length: 26,0 km.
- Starting Point at Elders substation: 26°13'57.96"S; 29°27'53.17"E.



Eskom Kudu – Elders 132kV power line and Elders Substation

- Middle Point: 26°10'47.32"S; 29°23'56.19"E.
- End Point at Kudu Substation site: 26° 5'37.81"S; 29°28'30.19"E.

Kudu - Elders 132kV power line - Co-ordinates every 250m

Table 1: GPS Co-ordinates along Kudu-Elders 132kV Power Line - every 250m

<b>Preferred Route 1</b>	<b>Longitude (E)</b>	<b>Latitude (S)</b>
(m)	(Decimal degrees)	(Decimal degrees)
Elders Substation	29,46431367	-26,2307459
250	29,46378351	-26,22861311
500	29,46325335	-26,22648035
750	29,46123076	-26,22574272
1000	29,45865277	-26,22552428
1250	29,45607479	-26,22530583
1500	29,4534968	-26,22508739
1750	29,45353938	-26,22311447
2000	29,45386384	-26,22095286
2250	29,4541883	-26,21879129
2500	29,45451277	-26,21662976
2750	29,45483723	-26,21446828
3000	29,45516169	-26,21230682
3250	29,45399601	-26,21112707
3500	29,45142239	-26,21087482
3750	29,44884878	-26,21062257
4000	29,44627516	-26,21037032
4250	29,44370155	-26,21011807
4500	29,44112794	-26,20986582
4750	29,43855432	-26,20961357
5000	29,43598071	-26,20936132
5250	29,43340709	-26,20910907
5500	29,43083348	-26,20885683
5750	29,42825986	-26,20860458
6000	29,42568625	-26,20835234
6250	29,42311263	-26,20810009
6500	29,42053902	-26,20784785
6750	29,41796541	-26,2075956
7000	29,41539179	-26,20734336
7250	29,41281686	-26,2071011
7500	29,41023998	-26,20687366
7750	29,4076631	-26,20664621
8000	29,40508622	-26,20641876
8250	29,40251142	-26,20617552
8500	29,39993793	-26,2059224
8750	29,39736444	-26,20566927
9000	29,39479095	-26,20541615
9250	29,39221745	-26,20516303
9500	29,38964396	-26,2049099
9750	29,38860637	-26,20324216
10000	29,38922248	-26,20112624
10250	29,38983859	-26,19901037

Eskom Kudu – Elders 132kV power line and Elders Substation

10500	29,39045471	-26,19689453
10750	29,39107082	-26,19477873
11000	29,39168693	-26,19266297
11250	29,39230304	-26,19054724
11500	29,39291916	-26,18843155
11750	29,39353527	-26,18631591
12000	29,39491239	-26,18449595
12250	29,39643002	-26,18273061
12500	29,39794765	-26,1809653
12750	29,39946528	-26,17920001
13000	29,40098291	-26,17743474
13250	29,40250053	-26,17566951
13500	29,40401816	-26,1739043
13750	29,40553579	-26,17213911
14000	29,40705342	-26,17037396
14250	29,40857104	-26,16860882
14500	29,41008867	-26,16684372
14750	29,4116063	-26,16507864
15000	29,41312393	-26,16331359
15250	29,41464739	-26,16155212
15500	29,41617207	-26,15979141
15750	29,41769674	-26,15803073
16000	29,41922142	-26,15627008
16250	29,4207461	-26,15450945
16500	29,42227077	-26,15274885
16750	29,42376988	-26,15097322
17000	29,4252178	-26,14916749
17250	29,42666571	-26,14736178
17500	29,42810971	-26,14555389
17750	29,42954776	-26,14374269
18000	29,43098582	-26,14193151
18250	29,43242388	-26,14012035
18500	29,43386194	-26,13830923
18750	29,43529999	-26,13649813
19000	29,43673805	-26,13468706
19250	29,43817719	-26,13287663
19500	29,43962647	-26,13107194
19750	29,44107574	-26,12926728
20000	29,44252502	-26,12746264
20250	29,44397429	-26,12565803
20500	29,44533288	-26,12380814
20750	29,44652785	-26,12187654
21000	29,44772282	-26,11994497
21250	29,44891779	-26,11801343
21500	29,45011276	-26,11608192
21750	29,45130773	-26,11415044
22000	29,4525027	-26,11221899
22250	29,45369767	-26,11028758
22500	29,45489264	-26,10835619
22750	29,4566916	-26,10681056
23000	29,45858719	-26,10532666

Eskom Kudu – Elders 132kV power line and Elders Substation

23250	29,45865002	-26,10364414
23500	29,46056437	-26,10217736
23750	29,46247872	-26,10071061
24000	29,46439306	-26,09924387
24250	29,46630741	-26,09777715
24500	29,46784573	-26,09616131
24750	29,46843	-26,09407195
25000	29,46999289	-26,09320889
25250	29,4723734	-26,09406691
25500	29,4748156	-26,0946423
25750	29,47578639	-26,09325584
Kudu Substation	29,475053	-26,093836
<b>Alternate Route 2</b>	<b>Longitude (E)</b>	<b>Latitude (S)</b>
(m)	(Decimal degrees)	(Decimal degrees)
Elders Substation	29,46431367	-26,2307459
250	29,46378351	-26,22861311
500	29,46325335	-26,22648035
750	29,46123076	-26,22574272
1000	29,45865277	-26,22552428
1250	29,45607479	-26,22530583
1500	29,4534968	-26,22508739
1750	29,453643	-26,225112
2000	29,453969°	-26,22285
2250	29,454312	-26,220611
2500	29,454652	-26,218366
2750	29,455092	-26,216191
3000	29,455716	-26,211357
3250	29,45399601	-26,21112707
3500	29,45142239	-26,21087482
3750	29,44884878	-26,21062257
4000	29,44627516	-26,21037032
4250	29,44370155	-26,21011807
4500	29,44112794	-26,20986582
4750	29,43855432	-26,20961357
5000	29,43598071	-26,20936132
5250	29,43340709	-26,20910907
5500	29,43083348	-26,20885683
5750	29,42825986	-26,20860458
6000	29,42568625	-26,20835234
6250	29,42311263	-26,20810009
6500	29,42053902	-26,20784785
6750	29,41796541	-26,2075956
7000	29,41539179	-26,20734336
7250	29,41281686	-26,2071011
7500	29,41023998	-26,20687366
7750	29,4076631	-26,20664621
8000	29,40508622	-26,20641876
8250	29,40251142	-26,20617552
8500	29,39993793	-26,2059224
8750	29,39736444	-26,20566927
9000	29,39479095	-26,20541615

Eskom Kudu – Elders 132kV power line and Elders Substation

9250	29,39221745	-26,20516303
9500	29,38964396	-26,2049099
9750	29,38860637	-26,20324216
10000	29,38922248	-26,20112624
10250	29,38983859	-26,19901037
10500	29,39045471	-26,19689453
10750	29,39107082	-26,19477873
11000	29,39168693	-26,19266297
11250	29,39230304	-26,19054724
11500	29,39291916	-26,18843155
11750	29,39353527	-26,18631591
12000	29,39491239	-26,18449595
12250	29,39643002	-26,18273061
12500	29,39794765	-26,1809653
12750	29,39946528	-26,17920001
13000	29,40098291	-26,17743474
13250	29,40250053	-26,17566951
13500	29,40401816	-26,1739043
13750	29,40553579	-26,17213911
14000	29,40705342	-26,17037396
14250	29,40857104	-26,16860882
14500	29,41008867	-26,16684372
14750	29,4116063	-26,16507864
15000	29,41312393	-26,16331359
15250	29,41464739	-26,16155212
15500	29,41617207	-26,15979141
15750	29,41769674	-26,15803073
16000	29,41922142	-26,15627008
16250	29,4207461	-26,15450945
16500	29,42227077	-26,15274885
16750	29,42376988	-26,15097322
17000	29,4252178	-26,14916749
17250	29,426155	-26,151185
17500	29,42810971	-26,14555389
17750	29,42954776	-26,14374269
18000	29,43098582	-26,14193151
18250	29,43242388	-26,14012035
18500	29,43386194	-26,13830923
18750	29,43529999	-26,13649813
19000	29,43673805	-26,13468706
19250	29,43817719	-26,13287663
19500	29,43962647	-26,13107194
19750	29,44107574	-26,12926728
20000	29,44252502	-26,12746264
20250	29,44397429	-26,12565803
20500	29,44533288	-26,12380814
20750	29,44652785	-26,12187654
21000	29,44772282	-26,11994497
21250	29,44891779	-26,11801343
21500	29,45011276	-26,11608192
21750	29,45130773	-26,11415044

22000	29,4525027	-26,11221899
22250	29,45369767	-26,11028758
22500	29,45489264	-26,10835619
22750	29,4566916	-26,10681056
23000	29,45858719	-26,10532666
23250	29,45865002	-26,10364414
23500	29,46056437	-26,10217736
23750	29,46247872	-26,10071061
24000	29,46439306	-26,09924387
24250	29,46630741	-26,09777715
24500	29,46784573	-26,09616131
24750	29,46843	-26,09407195
25000	29,467122	-26,096394
25250	29,4723734	-26,09406691
25500	29,4748156	-26,0946423
25750	29,47578639	-26,09325584
Kudu Substation	29,475053	-26,093836

## 2 Temporary Laydown area

Table 2: GPS Co-ordinates

LAYDOWN AREA AT ELDERS SUBSTATION	
Approximate Centre of Site	26°13'58.39"S; 29°27'55.75"E

## 7 PHYSICAL SIZE OF THE ACTIVITY

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

### 1 Kudu - Elders 132kV power line route alternatives

Table 3: The Kudu –Elders 132kV power line

Alternative:	Length of the activity:
Route 1 (Preferred)	26,019 km
Route 2 (Alternative)	26,029 km

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

### 1 Kudu - Elders 132kV power line routes

Table 4: The Kudu - Elders 132kV power line

Alternative:	Size of the site/servitude:
Route 1 (Preferred)	31m servitude x 26 019 m = 806 589m <sup>2</sup> / 80,65 ha
Route 2 (Alternative)	31m servitude x 26 029 m = 806 899m <sup>2</sup> / 80,68 ha

## 2 Temporary Laydown area

Table 5: The Kudu - Elders Laydown area

Alternative:	Footprint of the activity:
Laydown area (Inside Elders Substation site)	0,18 ha

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 line will also be used to gain access during construction. A temporary construction road will be selectively cleared in the new servitude area underneath the future power line to enable 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.

## 9 TOPOGRAPHY

The topography of the study area is open flat to slightly undulating grassland plains with a few scattered, low rocky hills and shallow, broad valleys in which small seasonal streams are typically found. The topography graph in Figure 5, below, is shown from Elders to Kudu (left to right). Most of the study site is within open farmlands that are regularly ploughed and cultivated with the main crop being the production of dryland maize (mielies). The average height above sea level across the study site (power line route) is around 1 595m, with a maximum and minimum elevation of around 1 642m and 1 536m, respectively. The average gradient (slope) is low at around 2%.

## 10 GRADIENT OF THE SITE

Table 6: 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
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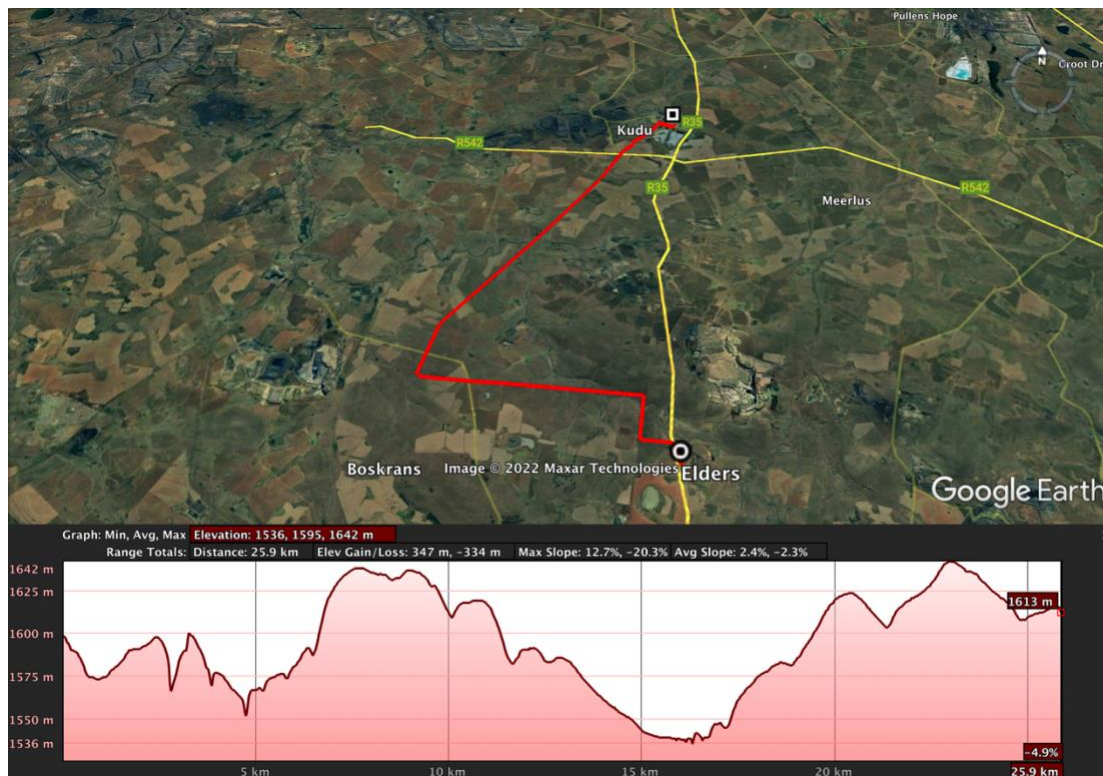


Figure 5: Topography from Elders (left) to Kudu (right)

## 11 LOCATION IN LANDSCAPE

The landform(s) that best describes the site.

Table 7: Landform

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
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## 12 GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site located on any of the following?

Table 8: 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 X	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 9: Groundcover

Natural veld - good condition % = 0	Natural veld with scattered aliens % = 38	Natural veld with heavy alien infestation % = 0	Veld dominated by alien species % = 0	Landscaped (vegetation) % = 0
Sport field % = 0	Cultivated land % = 60	Paved surface (Hard landscaping) % = 0	Building or other structure % = 2	Bare soil % = 0

Note: The ‘natural veld with scattered aliens’ is degraded grassland and includes watercourses.

### 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 10: 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 <sup>AN</sup>	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport <sup>N</sup>	23. Train station or shunting yard <sup>N</sup>	24. Railway line <sup>N</sup>	25. Major road (4 lanes or more) <sup>N</sup>
26. Sewage treatment plant <sup>A</sup>	27. Landfill or waste treatment site <sup>A</sup>	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam <sup>A</sup>	34. Small Holdings	
Other land uses (describe):	35. Power Station (Komati)			

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 represents a 500m radius around the site. Each block represents an area of 250m X 250m.



NORTH						
WEST	1,2,7	1,2,7	1,2,7	1,2,7	1,2,7	EAST
	1,2,7	35	35	1,2,7	1,2,7	
	8	8,35,32		33	1,2,7	
	1,2,7	1,2,7,32	1,2,7	1,2,7	1,2,7	
	1,2,7	1,2,7	1,2,7	1,2,7	1,2,7	
SOUTH						

**Note:** There is a lot of open-cast coal mining in the region, but presently none within a 500m radius of the proposed power line servitude.

## 15 SOCIO-ECONOMIC ASPECTS

The majority of the project is located in Steve Tshwete Local Municipality in the Nkangala District Municipality of Mpumalanga province. The seat of Steve Tshwete Local Municipality is Middelburg. According to StatsSA and Census 2011, Steve Tshwete Local Municipality has a total population of 217 073 people, of whom 73,6% are black African, and 21,8% are white. The other population groups make up the remaining 4,6%.

Of those aged 20 years and older, 3,4% have completed primary school, 30,8% have some secondary education, 35% have completed matric, and 14,4% have some form of higher education, while 7,4% of have no form of schooling. There are 64 971 households in the municipality, with an average household size of 3,3 persons per household. 29,4% of households are headed by females.

62,2% of households have access to piped water inside the dwelling, 23,5% of households have access to piped water in their yard and 1,8% have no access to piped water.

107 069 people are economically active (employed or unemployed but looking for work), and of these, 19,7% are unemployed. Of the 53 630 economically active youth (15 – 34 years) in the area, 27,1% are unemployed.

## 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.

## 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)

An application will be required 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)”.

*Buffer zones along watercourses have been recommended. Where possible, the poles (pylons) of the power lines must be placed at a minimum of 50m away from the edge of the watercourse. It will be possible to maintain this 50m buffer zone at most of the crossings and nearby areas, with the possible exception of the crossing at the Olifants River and associated floodplain wetland area. For this reason a General Authorisation (GA) process will be required for this project.*

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.

*The HIA confirmed the route along the power line to be of low archaeological potential. The lack of significant heritage resources was confirmed during the site visit and finds are of low significance and will not be directly affected by the project. Further, according to the SAHRA Paleontological sensitivity map the study area is of low to very high paleontological significance and an independent study was conducted for this aspect. Bamford (2022) concluded that based on the site visit there were no potentially fossiliferous rocky outcrops, and NO FOSSILS were seen on the surface. Nonetheless, because some parts were not visible, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required.*

National Forests Act (Act No. 84 of 1998)

The project will not require 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 not be required.

*No national or provincial protected tree species are present within the study site. There are very few trees present and many of those found in groves within the valleys and rocky areas are invasive alien blackwattle (*Acacia mearnsii*).*

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)

No plant permits in terms of section 15 of the NFA will be required as no national or provincial protected tree species are present within the study site.

*There are very few trees present and many of those found in groves within the valleys and rocky areas are invasive alien blackwattle (Acacia mearnsii).*

*There are no red data listed (RDL) species observed and none are expected to occur. There are a few scattered orange data listed (ODL) species, but most will be able to be avoided. These ODL species include: Hypoxis hemerocallidea and Crinum bulbispermum.*

**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 11: Listed Activities

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
GN R.327/2017 Activity 11	The <u>development of facilities or infrastructure</u> for the transmission and <u>distribution of electricity</u> — (i) <u>outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</u> (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more; excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development.	Construct a ± 26km Kingbird overhead 132kV line outside an urban area from Kudu Substation (at Komati Power Station) to the proposed Elders substation.  Construct 132/11kV 2x20MVA Elders Substation.
GN R. 327/2017 Activity 19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;  but excluding where such infilling, depositing, dredging, excavation, removal or moving— (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	Construct Power line structures/ monopole steel poles within 32 meters of a waterbody along the 132kV feeder line and excavate more than 10 cubic metres of soil and rock from a watercourse.
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended.	Describe the portion of the proposed project to which the applicable listed activity relates.
GN R. 324/2017 Activity 4	The development of a road wider than 4 metres with a reserve less than 13,5 metres. Mpumalanga i. Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	Access roads of wider than 4 metres to construct the power line in (bb) National Protected Area Expansion Strategy Focus areas and (ee) Critical biodiversity areas might be required.

**2.2 The Description of Listed activities associated with the Project activities**

- 1 Listing Notice 1 Activity 11: Construct a 132kV overhead power line as well as the 132/11kV 2x20MVA Elders Substation outside an urban area

#### 132kV overhead power line design specifications

It is proposed to construct the 132kV overhead distribution Kudu – Elders Kingbird power line over approximately 26 km, outside an urban area, from the existing Kudu substation to the proposed Elders Substation.

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.

The Kudu - Elders 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.

#### 132/11kV 2x20MVA Elders Substation

An area of 1 hectares will be cleared for the Elders substation. The proposed site is in an agricultural field thus no indigenous vegetation will be cleared. The site is not within any CBA, ESA or priority area. As mentioned a temporary laydown area is required for the construction phase of the power line. An area of 0.18 ha will be used inside the substation site for the laydown area. The substation will need access during the construction and operational phases. The access road will be a dirt track with no major construction work.

The Elders 132/11kV substation has equipment rated for 132kV, 66kV and 11kV. All clearance are for 132 kV and are in accordance with the Distribution Standard, Part 7: Substation, Section 2: Generic Substation Design.

#### High Level Scope of Work:

- Install high security perimeter fence.

- Build the substation platform as per the civil designs.
  - Install the substation earthmat, construct all equipment foundations, and Construct a runway.
  - Build the transformer oil holding dam with main holes and the transformer plinth.
  - Install substation crusher stones.
  - Build the substation control room and install control plant panels.
  - Install control plant LV cables.
  - Install a 2 x 132 kV Busbar using 120mm x 4 mm AL Tubes and one 132 kV Bus-Section Double Isolators.
  - Install 6 x 132 kV busbar VTs
  - Install one 132 kV Line Bay with a 132 kV breaker, 2 x 132 kV Isolators ( one with 132 kV surge arrestors) and 3 sets of 132 kV CTs.
  - Install 2 x 20 MVA 132/11kV Transformers.
  - Install 2 x 22 kV 1250 A 25 kA Transformer Combo breakers, Install 2 x 11 kV VTs, Install 2 x 22 kV 2500 A 25 kA Isolators, install 2 x 11 kV/400 V (360 earth fault restriction) NECRT, install 2 x 11 kV Cable end supports.
- 2 Listing Notice 1 Activity 19 - Infilling or excavation of more than 10 cubic metres into/from a watercourse

There are a number of small streams, seasonal drainage lines, wetlands and the perennial Olifants River in the study area. There are a number of watercourse crossings. The project will impact these as the line can not be designed to jump all of the watercourses. This will result in the excavation and infilling of more than 10 cubic metres to plant the pylons.

- 3 Listing Notice 3 Activity 4 - development of a road wider than 4 metres

The development of a road wider than 4 metres with a reserve less than 13,5 metres in Mpumalanga: (i) Outside urban areas: (bb) National Protected Area Expansion Strategy Focus areas; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.

Access roads wider than 4 metres might be required to construct the power line. 4m on either side of the line might be cleared of vegetation that interferes with the construction of the line. The site is in a Critical biodiversity area as well as in a National Protected Area Expansion Strategy Focus areas.

## 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 was identified. The Study Site is not within any national priority areas, including protected areas and important bird areas (IBAs). However, the

power line does, however, cross over the Olifants River, which is a FEPA River system. The southern section of the proposed power line route crosses through a critical biodiversity area (CBA). The northern section of the power line is not within a demarcated CBA. There are no Ecological Support Areas (ESAs) that are impacted by the power line route. The demarcated CBA (Irreplaceable) is open degraded grassland and is also part of the area in which the Olifants River flows.

The site is within the original extent of veldtype (ecosystem) of Eastern Highveld Grassland, which is a threatened veldtype/ecosystem with a status of 'Vulnerable'. According to the DEA Screening Tool and site investigations, the overall terrestrial biodiversity sensitivity is 'Very High'. However, most of the study site is transformed/alterd cultivated farmland. There is, however, a small section of moderately degraded grassland in the south that is also part of a demarcated CBA, which has a sensitivity of 'High'. There are no highly sensitive habitats, or no-go zones, present with the proposed power line servitude itself, with the exception of watercourses. The high sensitive areas of the study site are the watercourse crossings and include the buffer areas.

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.

In summary, The entire power line route / servitude has a sensitivity rating of 'Low', except the watercourses which have a sensitivity rating of 'High' and the area of grassland in the south that has a sensitivity rating of 'Medium'. The 'high sensitivity' areas of the watercourses includes the buffer zones. All existing and old cultivated farmlands has a sensitivity rating of 'Low'.

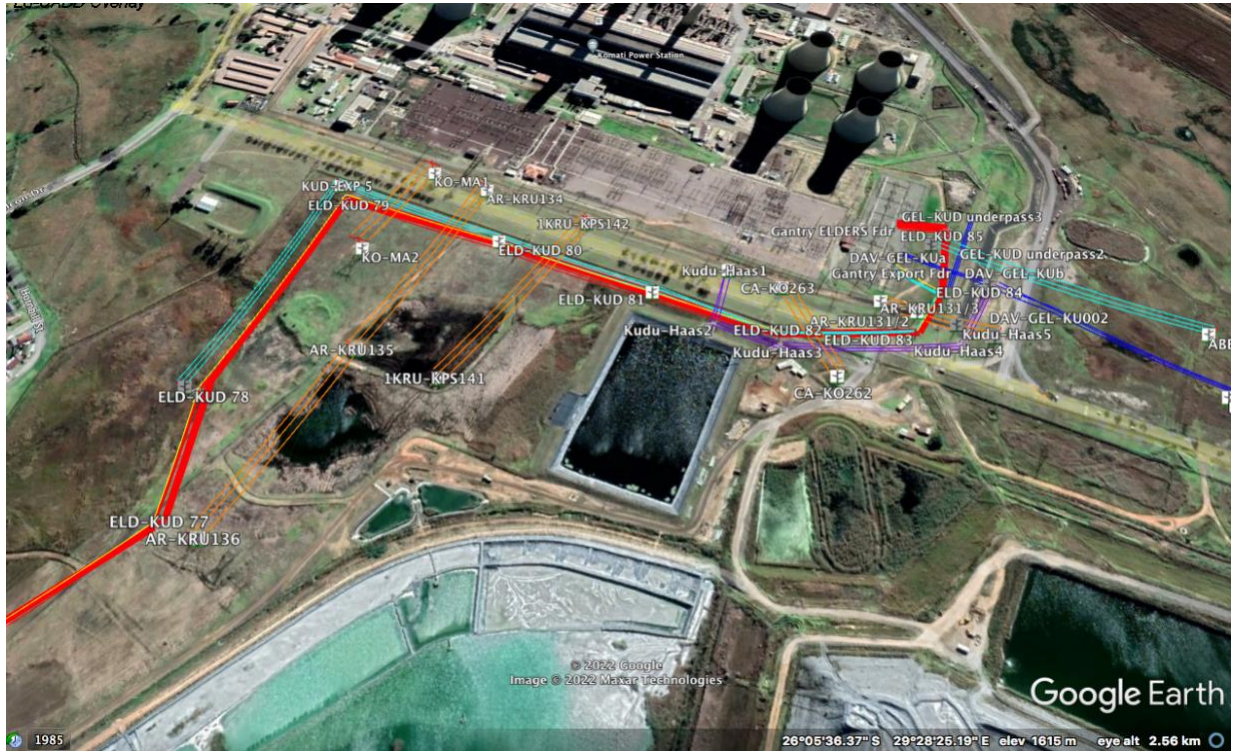
This EIA investigated a 200m corridor to accommodate any future deviation of the power lines. The EIA will seek to authorise the total corridor. The wider area that was investigated will allow future potential amendments to the EA should it be necessary (at a later stage). Should small changes be done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

Although a 200m corridor was investigated, the project team narrowed down the corridor to site specific placement of the structures. The positions of the pylons are in pre-liminary design but the detail design might necessitate changes in the final design. Stay positions are indicative only and the site specific requirements will be incorporated upon construction. The final design might affect structure type selection. There may be a requirement to add a structure in the line route pending on final clearances with the ground. This will however not change the alignment.

### **Kudu – Elders Route 1 (preferred)**

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.

Eskom Kudu – Elders 132kV power line and Elders Substation



Route 1 starts at the existing Kudu substation site, at Komati Power Station, on the farm Koornfontein 27 IS. (Refer to the red line for the proposed route.) The route exists the substation to the east amid myriads of other lines, turns south and follows a westerly direction to run to the south of a tar road towards Komati town area. The route turns south west to run to the east of Komati town area.

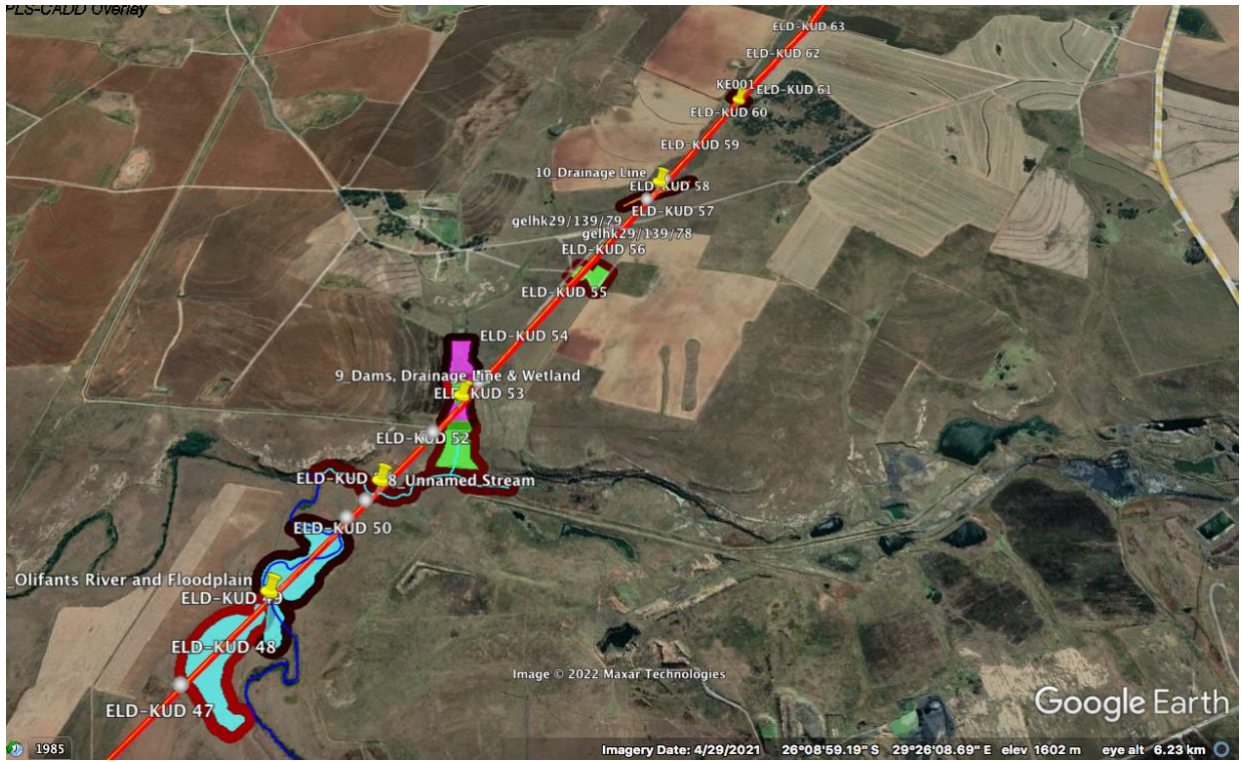




The route continues south west over the farms Goedhoop 46 IS and Kleinfontein 49 IS. The route crosses several wetlands, drainage lines and the Olifants river and its floodplain.



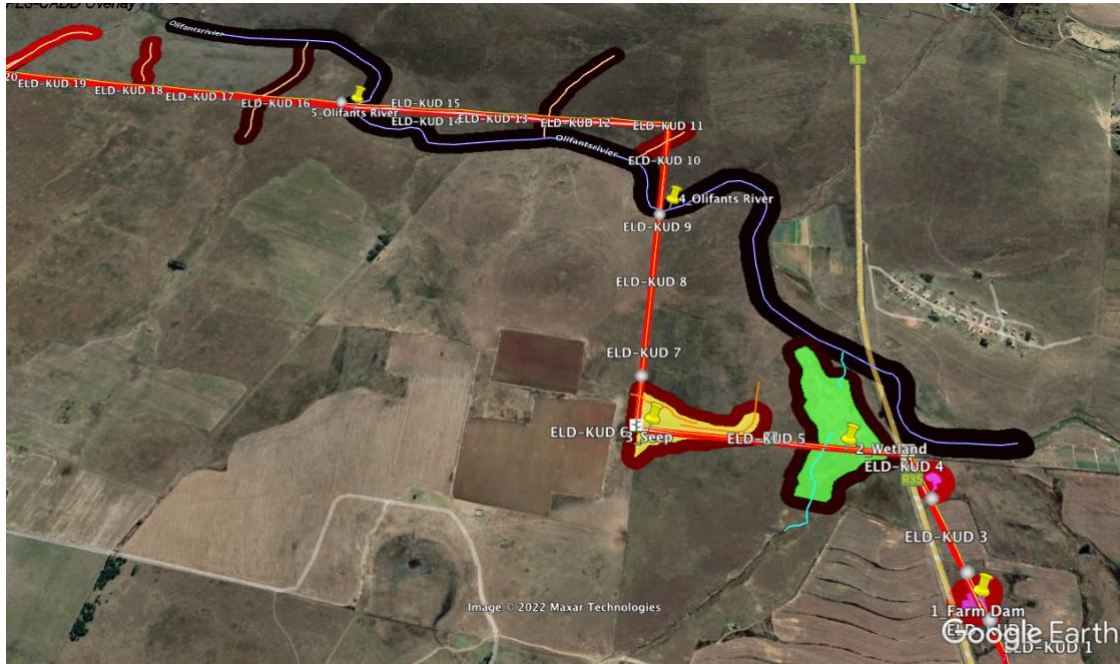
Eskom Kudu – Elders 132kV power line and Elders Substation



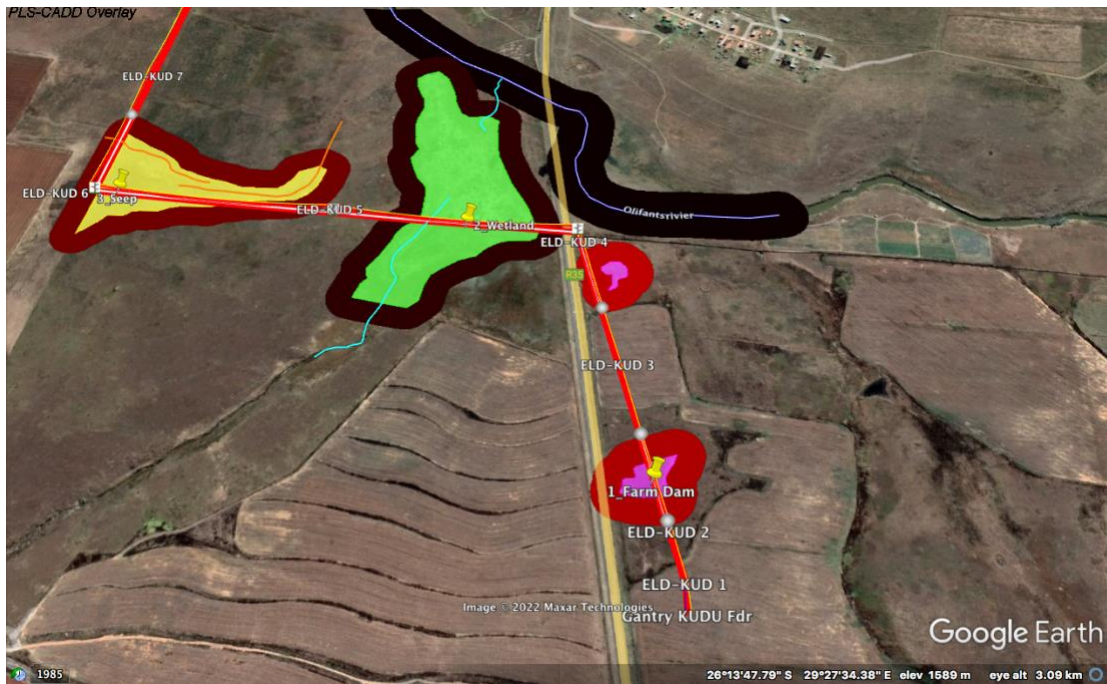
The route follows a corridor of overhead powerlines for approximately 13kms up to pylon 38 (refer to map above for pylon “Eld-Kud 38”) on the farm Kleinfontein 49 IS. At this point the route separates from the overhead corridor and runs south over Kleinfontein 49 IS to turn east at pylon 32 and continue east up to

## Eskom Kudu – Elders 132kV power line and Elders Substation

the Kleinfontein/Middelkraal border. On the way more drainage lines as well as the Olifant river will be crossed. At this point (pylon 11) the line turns south on the border of Schoonvlei 52 IS and Middelkraal 50 IS.



At pylon 6 the route runs to the east, crosses a wetland and the R35, to turn south on the eastern side of the R35. This is in an area just south of the Olifants river. The line runs south on agricultural fields towards the site for Elders Substation.



### Kudu – Elders Route 2 (Alternative)

Alternative Route 2 follows the same alignment as Route 1 but with two main deviations. The two areas where the line route alternatives differ are in the area of Kleinfontein 49 IS / Middelkraal 50 IS (Figure 6), and Portions 2 & 4 of Farm Goedehoop 46 IS (Figure 7).

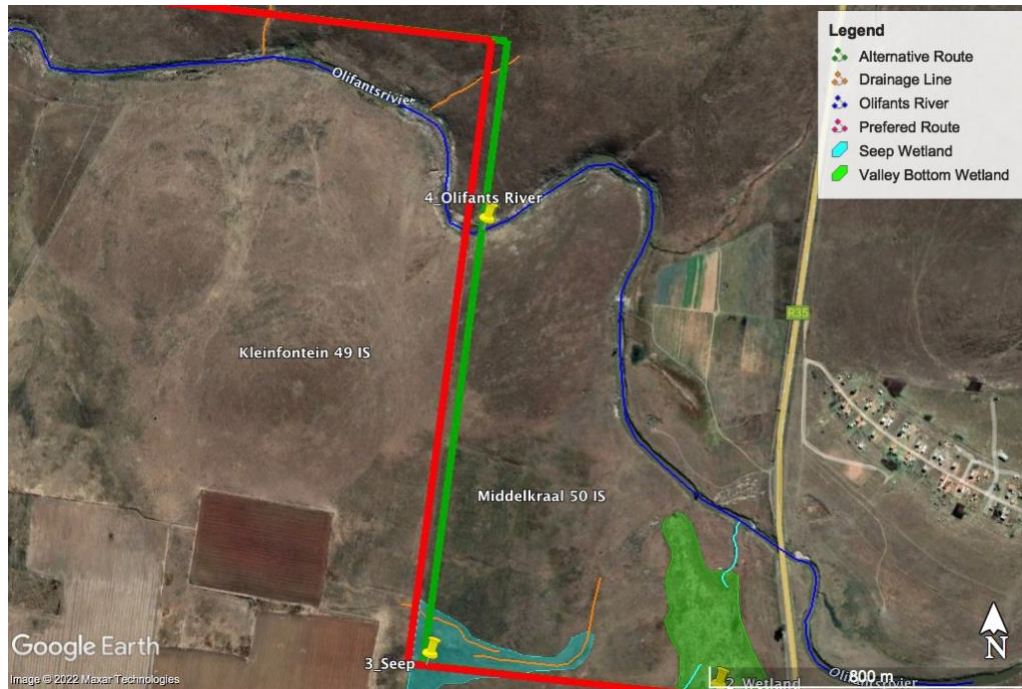


Figure 6: Area of deviation between Route Alternatives (Kleinfontein 49 IS / Middelkraal 50 IS)

In the first area the Preferred Route runs west and in Farm Kleinfontein, while the Alternative Route turns east and in Farm Middelkraal. This is close to the proposed Elders Substation and west of the R35.

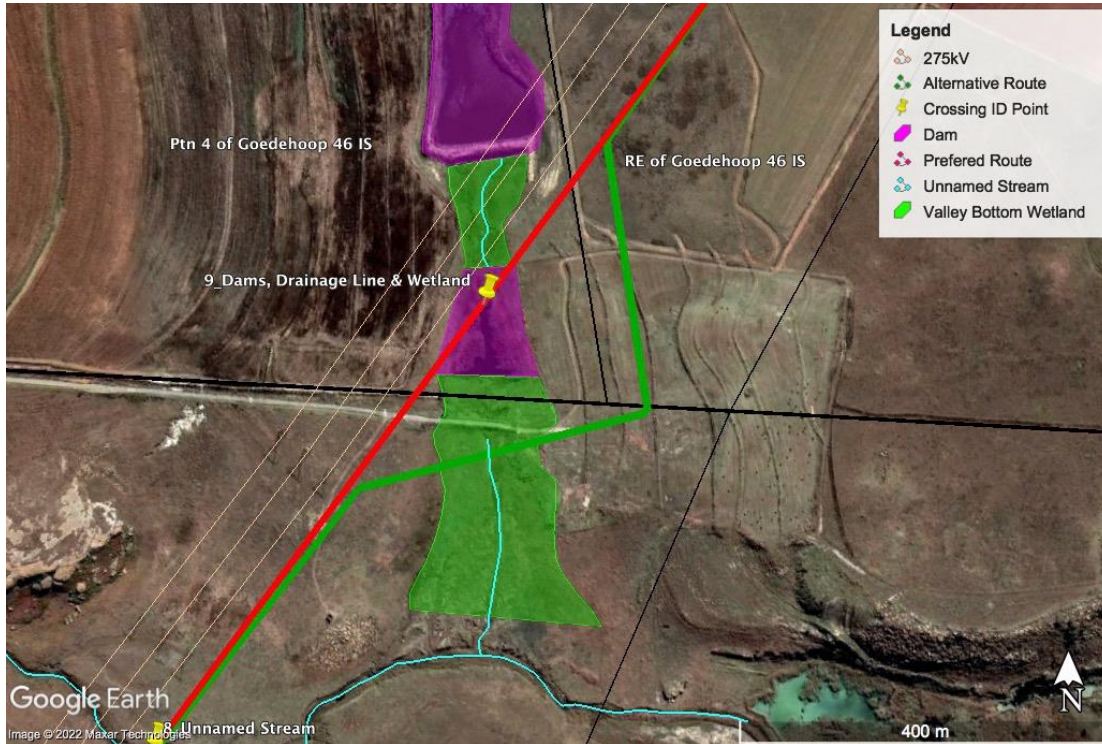


Figure 7: Area of deviation between Route Alternatives (Portions 2 & 4 of Farm Goedehoop 46 IS)

In the second both route alternatives cross over the same watercourse systems, but just in different areas. The Preferred Route runs adjacent and parallel to large, existing 275kV lines, while the Alternative Route deviates east and through the farm Goedehoop over a distance of about 604m. The deviations were in anticipation of the preference of affected landowners in these areas.

Route alternative recommendations: Ecological

Two alternative routes for the power line were investigated. They are very similar in terms of potential impacts on watercourses and other habitats, and run within the same servitude for most of their length, but with two main deviations.

In reality there is no significant difference between the two route alternatives in terms of impact on biodiversity and either route may be used.

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 12: Measurements of impacting factors per route alternative

Factors	Preferred Route	Alternative Route
Risk-creating factors		
Wetlands & dams	2 654	2 813
Number of rivers & streams	3	3
Number of drainage lines	7	7
Grassland (m)	9 800	9 800

Risk-reducing factors		
Cultivated lands (m)	15 600	15 600
TX lines (m)	13 000	13 000
Roads (m)	710	710
Suburban / Industrial (m)	890	890
Total length of power line (m)	26 019	26 029

Table 13: Sensitivity analysis ratings (Score)

Factors	Preferred Route	Alternative Route
<b>Risk-creating factors</b>		
Wetlands & dams	13 270,00	14 065,00
Number of rivers & streams	9,00	9,00
Number of drainage lines	21,00	21,00
Grassland	39 200,00	39 200,00
<b>Risk-reducing factors</b>		
Cultivated lands	-31 200,00	-31 200,00
Existing TX lines	-13 000,00	-13 000,00
Roads	-1 420,00	-1 420,00
Suburban/industrial	-4 450,00	-4 450,00
<b>TOTAL</b>	<b>2 430,00</b>	<b>3 225,00</b>

The final calculated risk score, as per the methodology, shows that there is a slight difference between the Preferred Route and the Alternative Route (Table 13). There are areas where the two alternative routes deviate from each other, but across these areas there are no significant or meaningful deciding factors. The main difference is in the distance (m) across or near to wetlands and dams. For the Preferred Route the distance is 2 654m and 2 813m for the Alternative route (Table 12). This slight difference of 150m gives the Preferred Route a slightly better rating in terms of risks to birds. However, in reality, the final risks are the same. The 150m difference is in the area just north of the Olifants River, along the property boundaries of the farms Goedehoop and Kleinfontein, where the Preferred Route runs straight across the dams & wetlands, while the Alternative Route deviates east and then north over this section (**Error! Reference source not found.**). However, in reality the alternatives will have the same potential impact on birds in this area.

Therefore, In terms of risks either of the route alternatives may be used.

#### Route alternative recommendations: Heritage

Two alternatives were considered namely Route 1 and 2 and both are acceptable from heritage and palaeontological point of view.

#### Route alternative recommendations: Landowners/landusers

The deviations as proposed in Route 2 were in anticipation of landowner preferences. In reality there is no significant difference between the two route alternatives in terms of impact on biodiversity, heritage and palaeontology.

In summary, taking the ecological, avifauna and heritage sensitivities into account, the recommended route could be either Route 1 or Route 2. In terms of landowner preference Route 1 is the preferred route.

## 2 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.

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 ASESMENT

A Biodiversity Assessment has been conducted by Flori Scientific Services. Refer to Appendix D1 of the BAR. The report identified the following:

#### *Watercourses*

The main rivers and streams in the region of the study site are the Olifants River and the Koringspruit (Stream). The proposed power line will cross over the Olifants River in a few places, but will not have any impact or cross over the Koringspruit, which is in the area of the Kudu Substation. The Olifants River is a major perennial watercourse in the region and flows in a westerly direction and then later in a northerly direction. The river eventually flows eastwards and into the Limpopo River. Besides the prominent, perennial Olifants River, there are several small seasonal drainage lines / streams that the power line will either cross or come into close proximity of. There are also a few wetlands in the area of the power line, but none in the area of the Elders Substation. There are no prominent freshwater pans in the proposed power line servitude. Endorheic freshwater pans are fairly common in the highveld grassland region of Mpumalanga Province.

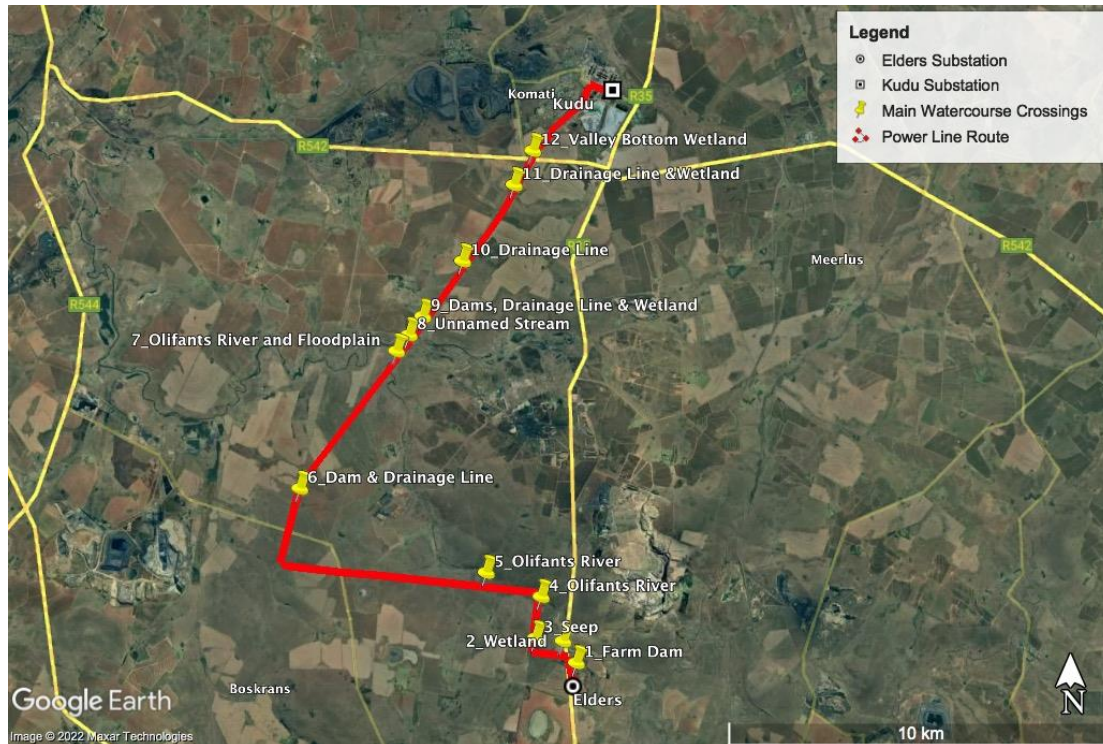


Figure 8: Main Watercourse Crossings

Table 14: Main Watercourse crossings

Map ID Number	Coordinates	Type of Watercourse
1	26°13'51.23"S; 29°27'51.40"E	Farm Dam
2	26°13'32.88"S; 29°27'39.00"E	Valley Bottom Wetland
3	26°13'30.43"S; 29°27'13.32"E	Seep Wetland
4	26°12'55.70"S; 29°27'18.40"E	Olifants River
5	26°12'35.46"S; 29°26'27.01"E	Olifants River
6	26°11'24.83"S; 29°23'32.69"E	Dam & Drainage Line
7	26° 9'29.59"S; 29°25'3.24"E	Olifants River & Floodplain
8	26° 9'16.02"S; 29°25'14.91"E	Unnamed stream (tributary to Olifants River)
9	26° 9'0.46"S; 29°25'27.77"E	Dams, drainage line & wetland
10	26° 8'14.11"S; 29°26'5.01"E	Drainage Line
11	26° 7'10.20"S; 29°26'53.13"E	Drainage Line & Valley Bottom Wetland
12	26° 6'41.49"S; 29°27'10.64"E	Valley Bottom Wetland





Figure 9: Delineated watercourses (Total study site)

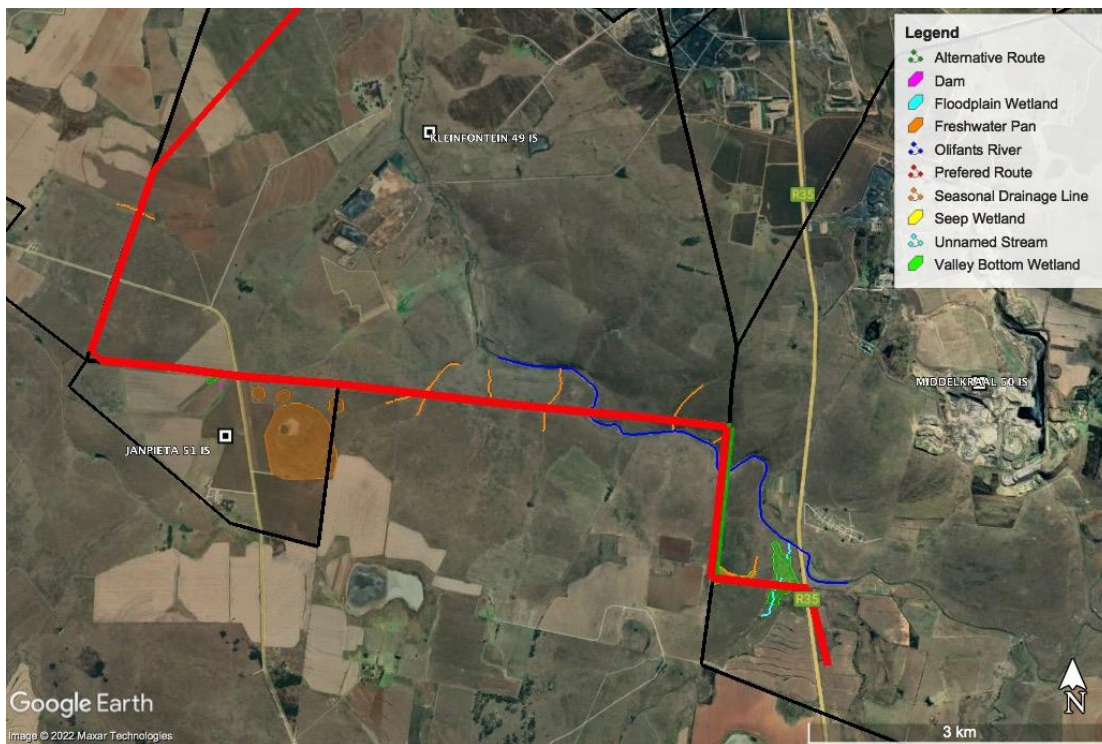


Figure 10: Delineated watercourses: Southern Section

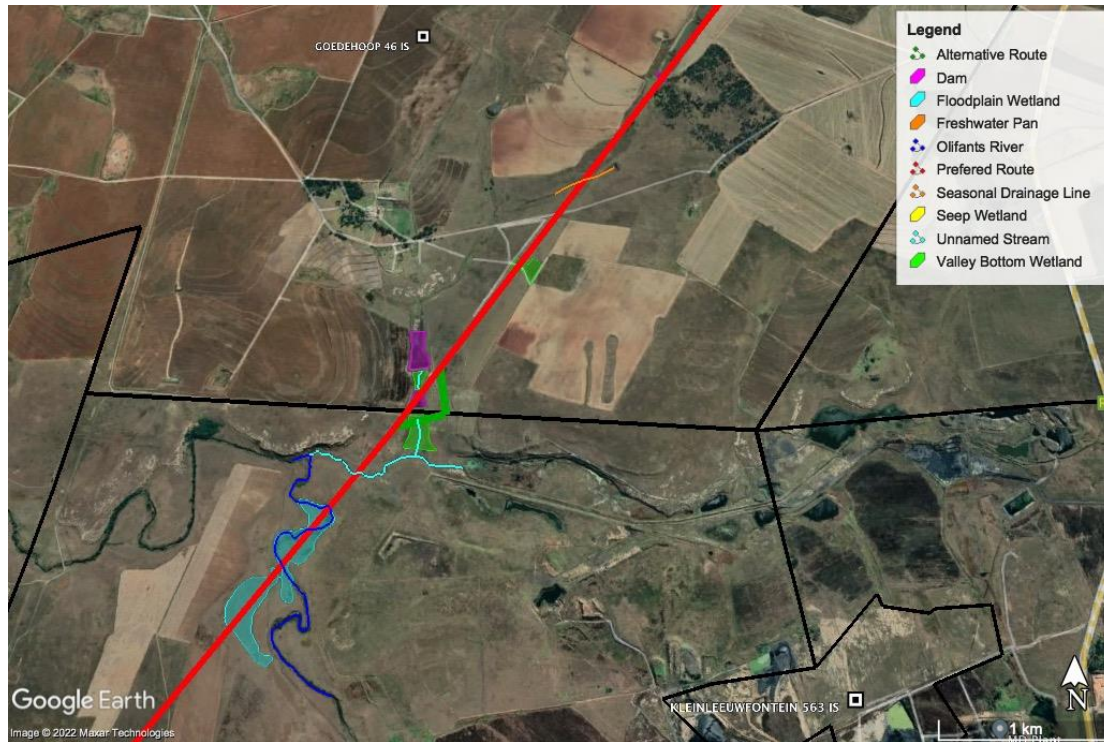


Figure 11: Delineated watercourses: Central Section



Figure 12: Delineated watercourses: Northern Section

*Drainage Region*

Table 15: Below is a summary of the drainage region/catchment area for the study site.

Level	Category
Primary Drainage Area (PDA)	B
Quaternary Drainage Area (QDA)	B11A & B11B
Water Management Area (WMA) – Previous / Old	Olifants
Water Management Area (WMA) – New (as of Sept. 2016)	Olifants (WMA 2)
Sub-Water Management Area	Upper Olifants
Catchment Management Agency (CMA)	Olifants (CMA 2)
Wetland Vegetation Ecoregion (WetVeg)	Mesic Highveld Grassland (Group 4)
RAMSAR Site	No
River FEPA	Yes (Olifants)
Wetland FEPA	No
Fish FEPA	No
Fish FSA	No
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 within the veldtype commonly known as Eastern Highveld Grassland. The veldtype / ecosystem is threatened with a status of 'Vulnerable'. Much of the natural grassland vegetation in the study area has been transformed or altered by years of farming practices (mainly in the form of ploughing and cultivation of dryland maize production). Smaller open grassland areas are generally used for the grazing of livestock such as cattle, which also puts pressure on natural grasslands, along with regular winter veldfires. The most natural occurring Eastern Highveld Grassland is along the Olifants River in the south of the study site area for the power line route. Here the grass typically tends to be short and dense and interspersed with numerous herbaceous plant species. The dominant and most common species present are the grasses of *Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, and *Tristachya*.

Most trees observed in the study area are the invasive alien blackwattle (*Acacia mearnsii*). No naturally occurring trees or shrubland is present in the proposed power line servitude or the substation site.

The vegetation of the Elders Substation site has been totally transformed by years of ploughing and cultivating of the area. No natural vegetation remains.

The grasslands of the Mpumalanga Highveld are dotted with freshwater wetlands that mostly include valley bottom wetlands, seeps and seasonal endorheic pans. These wetlands tend to be within a flat landscape or shallow depressions filled with temporary water bodies supporting zoned systems of aquatic and hygrophilous vegetation of temporarily flooded grasslands and ephemeral herblands. Most of the grasses and herbs growing in these wetlands are also found in the adjacent grassland areas. There are few true aquatic species present due to their fairly highly seasonal / temporary nature. Plants such as *Hypoxis spp.*, *Cyperus spp.* and *Crinum spp.* are typically found in the wetter soils of the wetlands. Everlastings (*Helichrysum spp.*), along with certain grasses like cottonwool grass (*Imperata cylindrica*) tend to thrive in the wetter soils as well and are often the best indicators of the presence of a wetland.

There are no red data listed (RDL) species observed and none are expected to occur. There are a few scattered orange data listed (ODL) species, but most will be able to be avoided. These ODL species include: *Hypoxis hemerocallidea* and *Crinum bulbispermum*.

**Fauna**

There are potentially a number of different faunal species present in the study area and surrounding areas. There are some ideal habitats, especially within the less impacted on small drainage lines / streams and open grassland areas. However, although the area is open, with low density urbanisation, the natural environment has been badly impacted on over the years by cultivated farmlands and open-cast coal mining operations. This has led to a significant loss in faunal species, including large- to medium-sized mammals and reptiles in particular. Other negative impacts have been on grassland birds, including the large storks and cranes that are very much ground foraging and dwelling birds.

The Red Data Sensitivity Index Score (RDSIS) was calculated for the study area. The Probability of Occurrence (POC) is the probability of the animal/s occurring in the study area. The calculated POC of the mammal species is calculated by taking the animal’s historical distribution, present habitat availability and present food source into account.

The Red Data Sensitivity Index Score (RDSIS) for the study area’s potential Red Data Listed (RDL) mammals yielded an average score of 30,12%, indicating a ‘Low / Medium’ index score of importance or potential occurrence with regards to RDL mammal species within the general vicinity of the study area. (Note this does not reflect or indicate a potential presence of all faunal species).

RED DATA SENSITIVITY INDEX SCORE (RDSIS)	
Average Total Species Score	42,7%
Average Threatened Taxa Score	30,12%
Average of the combined Total Species and Threatened Taxa Scores	36,40%
% of Species with a Probability of Occurrence of >60%	24,1%
RDSIS for the Study Site	30,3%
RDSIS Category for Study Site	LOW / MEDIUM

Low: 0-20%; Low/Medium: 21-40%; Medium: 41-60%; Medium/High: 61-80%; High: 81-100%

**Priority areas**

The study site is not within any national priority areas.

**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 community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity
Transformed (Farmland)	Low	Low	Low
Grassland	Medium	Medium	Medium
Watercourse	Medium / High	Medium / High	Medium / High

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

**Fatal flaws**

There are no fatal flaws and the project may proceed.

### Sensitivity Maps

The maps (figures) below highlight the various sensitivity levels in the study area, which is on average about 200m in width. That is, about 100m each side of the central line of the proposed power line servitude. The main areas of 'High Sensitivity' are at watercourse crossings, as found scattered along the length of the study site. Another main area of 'High Sensitivity' is in the south, near the proposed Elders Substation, where the study site runs through a demarcated CBA area.

Note that the 50m wide buffer zones are incorporated into the delineated 'High Sensitivity' areas. This is because a buffer zone is a type of 'no-go' zone and is delineated to protect a sensitive area / habitat.

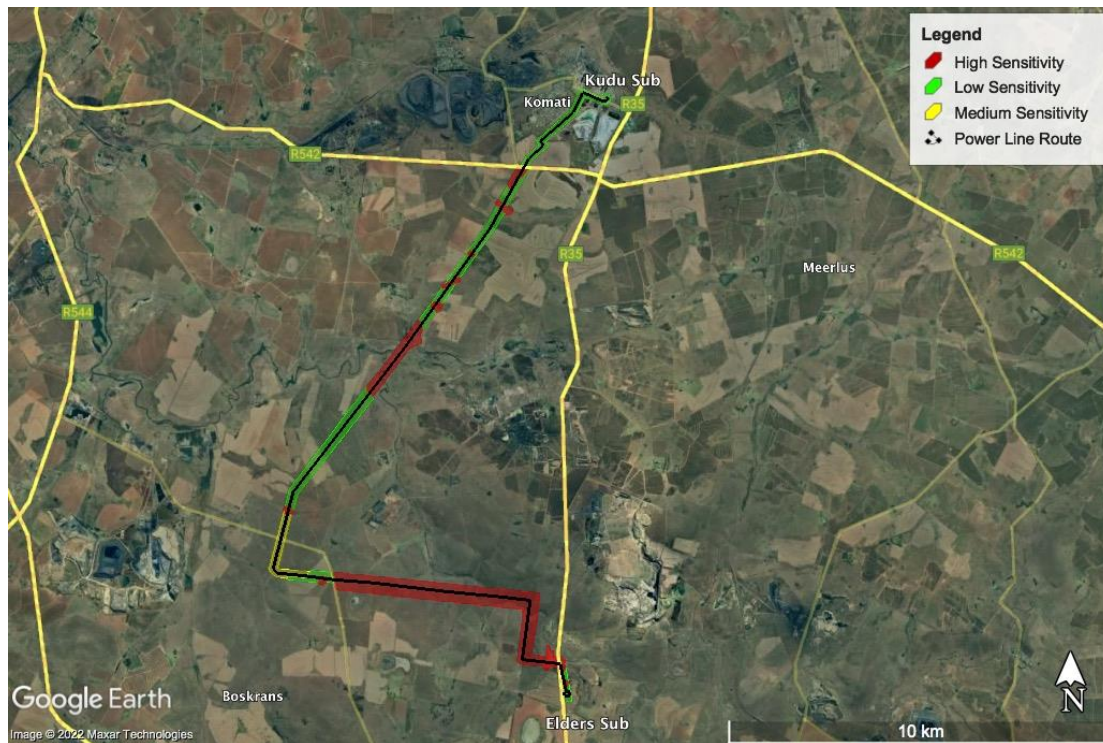


Figure 13: Sensitivity Map

Eskom Kudu – Elders 132kV power line and Elders Substation

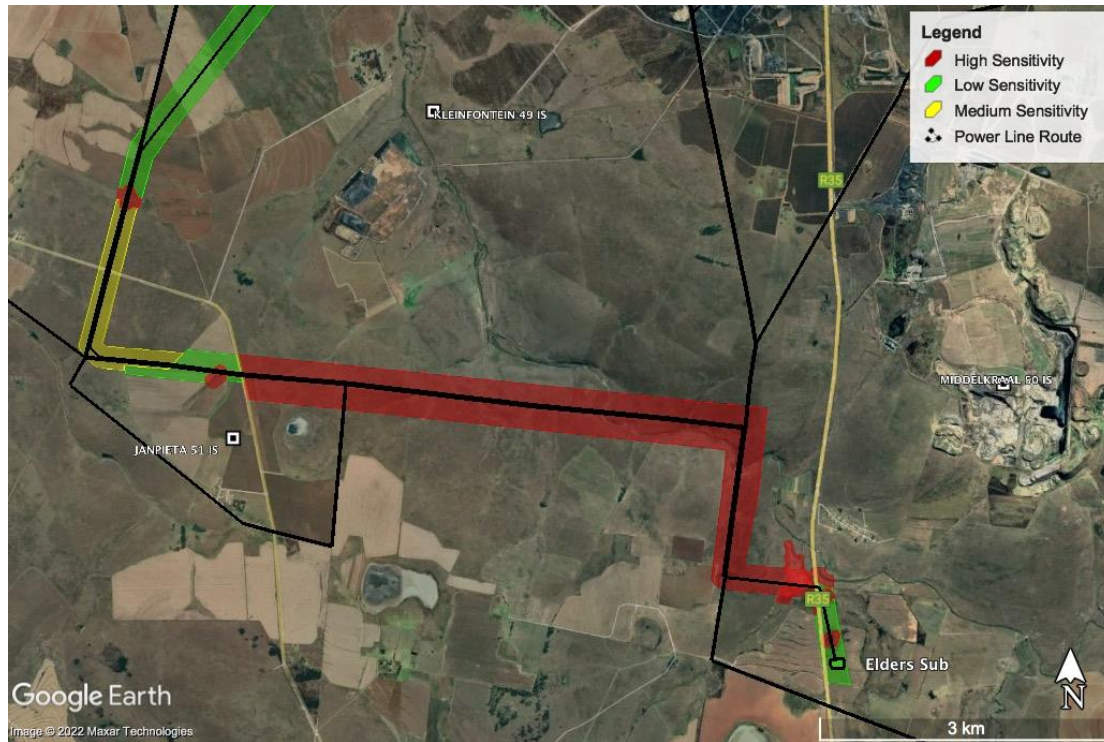


Figure 14: Sensitivity Map: Southern Section

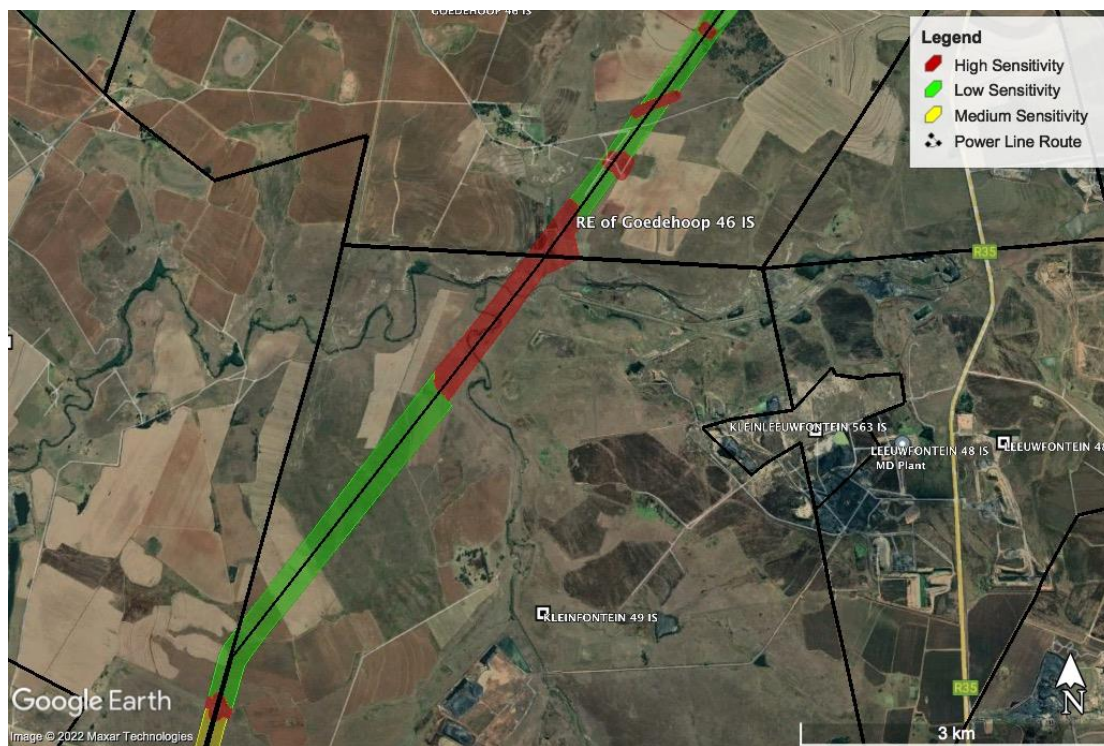


Figure 15: Sensitivity Map: Central Section

Eskom Kudu – Elders 132kV power line and Elders Substation

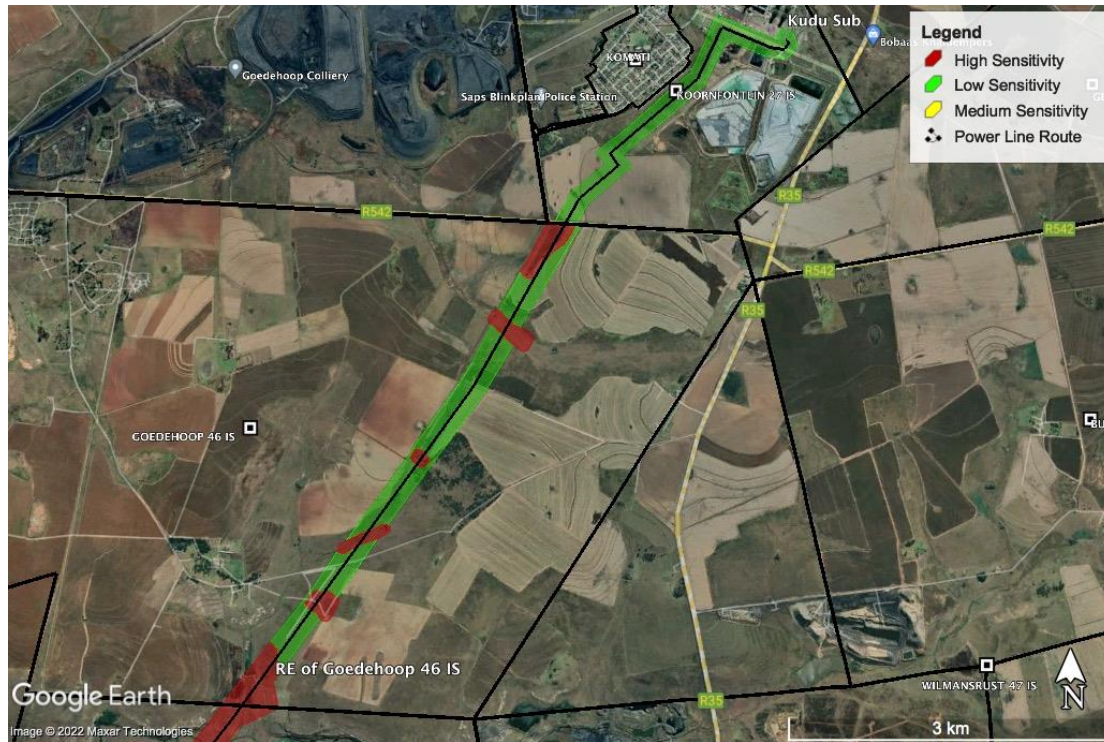


Figure 16: Sensitivity Map: Northern Section



Figure 17: Sensitivity Map: Elders Substation

### Buffer Zones

Buffer zones along watercourses have been recommended. Where possible, the poles (pylons) of the power lines must be placed at a minimum of 50m away from the edge of the watercourse. The edge of a watercourse is seen as the edge of the river or stream bank (in case of rivers and streams), and the edge of the temporary zone (in case of wetlands). Power lines have very little to no long-term negative impact on watercourses, even if poles are on the edge of them. However, to ensure that the integrity of the watercourses is maintained, especially the edges of stream banks during the construction phase a more than adequate 50m wide buffer zone has been recommended.

It will be possible to maintain this 50m buffer zone at most of the crossings and nearby areas, with the possible exception of the crossing at the Olifants River and associated floodplain wetland area (See Crossing No. 7 in Figure 8 and Table 14). For this reason it is likely that a General Authorisation (GA) process will be required for this project. Notwithstanding, the buffer zones must be delineated and maintained as far as possible. That is, they must be seen as 'no-go zones' in terms of the general movement of people and vehicles; placement of portable toilets; laydown areas; temporary storage areas, etc.

There are no buffers required for the Elders Substation site.

Note: The delineated buffer zones are incorporated into (form part of) the delineated 'High Sensitivity' areas, as per the above sensitivity maps.

### Conclusions

The conclusions of the biodiversity study are as follows:

- The study site is within the original extent of Eastern Highveld Grassland, which is a threatened veldtype / ecosystem with a status of 'Vulnerable'.
- Most of the power line route is within altered cultivated farmlands. The Elders Substation site is within a totally altered / transformed environment.
- There are a number of small streams, seasonal drainage lines, wetlands and the perennial Olifants River in the study area. There are a number of watercourse crossings.
- The study site is not within any national priority areas such as protected areas, important bird areas (IBAs), etc. However, the Olifants River is an important FEPA river.
- No red data listed (RDL) floral species were observed in the study area and none are expected to occur. A few orange data listed (ODL) species were observed, but most if not all can be avoided.
- The southern section of the power line servitude is within a critical biodiversity area (CBA). There are no ecological support areas (ESAs) present in the study area.
- The Elders Substation site is not within any CBA, ESA or priority area.
- There are no obvious fatal flaws in terms of the natural ecology.
- It is more than likely that a General Authorisation (GA) process will be required for the project, unless the span of the power line will be able to clear the wetland area plus the associate buffer zone. If not, the applicant must apply for a GA / water use.
- Taking all findings and recommendations into account it is the reasonable opinion of the author / specialist that the activity may be authorised. The project and related activities should be allowed to proceed.

### Recommendations

The recommendations of the study are as follows:



- All recommended mitigating measures as proposed in this study and report should be implemented if the findings of this report are to remain pertinent. All of the recommended mitigating measures must be part of the conditions in the EMP.
- The only buffer zones required for the project are at watercourse crossings. A 50m wide buffer zone, from the edge of riverbanks, stream banks, and temporary wetland zones have been demarcated and no pylons / poles are allowed to be planted within these buffer zones, unless absolutely necessary. Doing so may trigger the need for a General Authorisation (GA) process. Even if a GA or WUL is granted all effort must still be made to keep poles out of buffered areas to protect the integrity of the watercourses buffered.
- All mitigating measures recommended in this study must be implemented and form part of the conditions for the EMP.
- The preferred power line route and the alternative power line route both have the same impacts on the natural environment. Either route alternative is expectable in terms of the natural biodiversity and can be used. Other factors, such as costs, landowner agreements, etc. can be used to determine the final route alternative.

## 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:

### **Bird Habitats**

There are three distinct bird habitats found within and around the study area, namely: Grassland, Watercourses, and Cultivated Fields (Farmlands). There are no pristine areas of grassland. The grassland is moderately to mostly degraded, which has a significant impact on ideal bird habitats and the presence and general functioning of birds in those areas / habitats. Watercourses include linear elements such as rivers and streams and modular elements such as pans and most wetlands.

### *Priority areas*

The study area is not situated within an Important Bird Area (IBA). The closest IBA is the important grassland ecosystem Amersfoort-Bethal-Carolina IBA, which is situated approximately 17km southeast of the power line route.

### *Sensitivity analyses*

- The site is within the original extent of veldtype (ecosystem) of Eastern Highveld Grassland, which is a threatened veldtype / ecosystem with a status of 'Vulnerable'.
- There are no highly sensitive habitats, or no-go zones, present with the proposed power line servitude itself, with the exception of watercourses, in terms of the ecological sensitivity. That is to say that there are few to no pristine habitats present in the study area.
- The southern section of the proposed power line servitude is within demarcated critical biodiversity area (CBA).
- Most of the study area (including the Elders Substation site) is transformed / altered cultivated farming environment. The grassland that is present is moderately to highly degraded.
- The entire proposed Elders Substation location is transformed and has a sensitivity rating of 'Low'.
- The entire power line route / servitude has a sensitivity rating of 'Low', except the watercourses which have a sensitivity rating of 'High' and the area of grassland in the south that has a sensitivity

rating of ‘Medium’. The ‘high sensitivity’ areas of the watercourses includes the buffer zones. All existing and old cultivated farmlands has a sensitivity rating of ‘Low’.

- Grasslands are frequented by grassland birds, including a number of raptors such as falcons and kites, especially during the wet, summer season. The project will have no impact on grasslands in general, including in the power line servitude.
- The biggest impact will be in terms of potential bird impacts and electrocutions along the new proposed 132kV power line and NOT in terms of loss of habitat. There will be very little to no loss in existing habitat.

The high-risk bird areas in the study area are the watercourses, where the highest potential risks of in-flight collisions are present. The new proposed line will run parallel and right next to existing large transmission lines, which is a big reducing factor in potential in-flight collisions.

The GPS points at the watercourse crossings where BFDs need to be placed are shown below in Table 15. The map showing the corresponding locations of these identified crossings are shown below in Figure 18. The BFDs need to be placed across the entire length of the demarcated watercourses, including the buffer zones. There is no need to place BFDs in any other locations along the power line route or within the Elders Substation. The proposed substation is within a totally transformed area of old farmlands.

The buffer zones for the watercourse crossing are all 50m from the edge of the watercourse. Therefore the placement of BFDs will be across the watercourse (river, stream, wetland, farm dam) plus the surrounding 50m buffer area.

Table 15: GPS Coordinates for BFDs

Map ID Number	Coordinates	Type of Watercourse
1	26°13'51.23"S; 29°27'51.40"E	Farm Dam
2	26°13'32.88"S; 29°27'39.00"E	Valley Bottom Wetland
3	26°13'30.43"S; 29°27'13.32"E	Seep Wetland
4	26°12'55.70"S; 29°27'18.40"E	Olifants River
5	26°12'35.46"S; 29°26'27.01"E	Olifants River
6	26°11'24.83"S; 29°23'32.69"E	Dam & Drainage Line
7	26° 9'29.59"S; 29°25'3.24"E	Olifants River & Floodplain
8	26° 9'16.02"S; 29°25'14.91"E	Unnamed stream (tributary to Olifants River)
9	26° 9'0.46"S; 29°25'27.77"E	Dams, drainage line & wetland
10	26° 8'14.11"S; 29°26'5.01"E	Drainage Line
11	26° 7'10.20"S; 29°26'53.13"E	Drainage Line & Valley Bottom Wetland
12	26° 6'41.49"S; 29°27'10.64"E	Valley Bottom Wetland

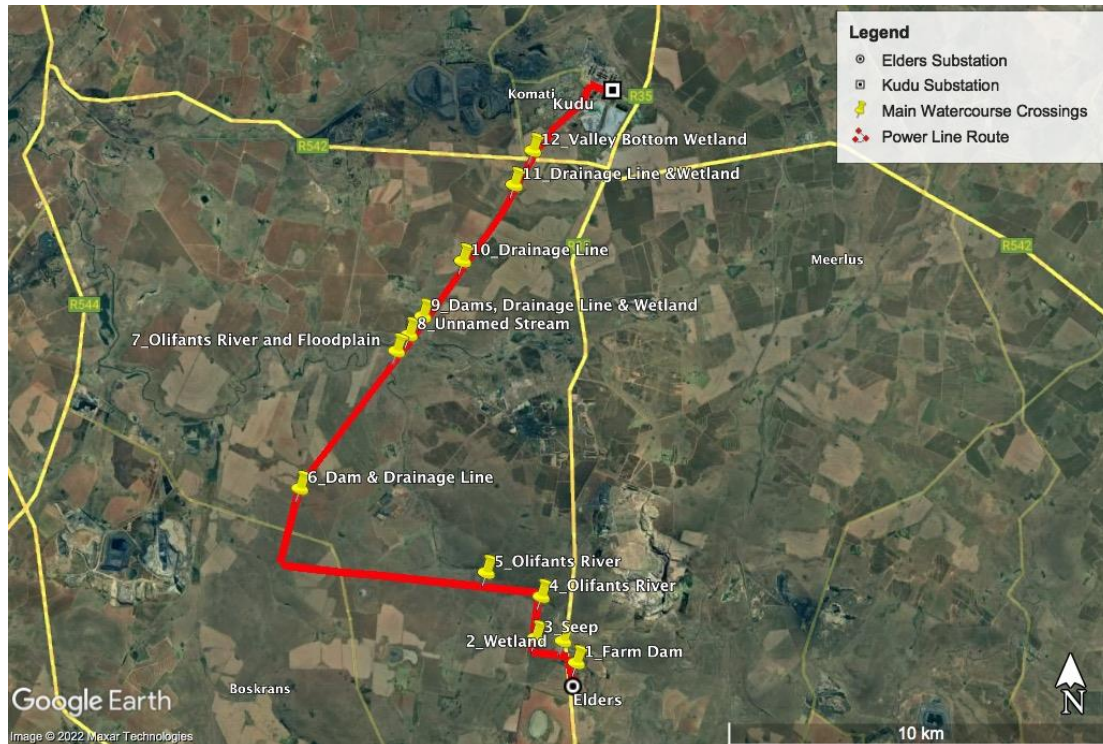


Figure 18: Watercourse crossings

The Avifauna Sensitivity Map for the power line route and Elders Substation is shown below (Figure 19). The high sensitivity areas are the main delineated watercourse crossings and buffer zones. The medium sensitivity areas are all located within the more open grassland areas in the south of the study area. This is also in the area parallel to the Olifants River and the demarcated CBA area. The low sensitivity areas are where the proposed power line runs directly next to large existing 275kV power lines (as well as within farmlands, although in and of themselves they cannot always be viewed as low sensitivity depending on the area and observed bird species). The section of proposed line that runs between the R542 and Kudu Substation also has a low sensitivity because it runs next to power lines and within a built up urban / village area and the Komati Power Station infrastructure.

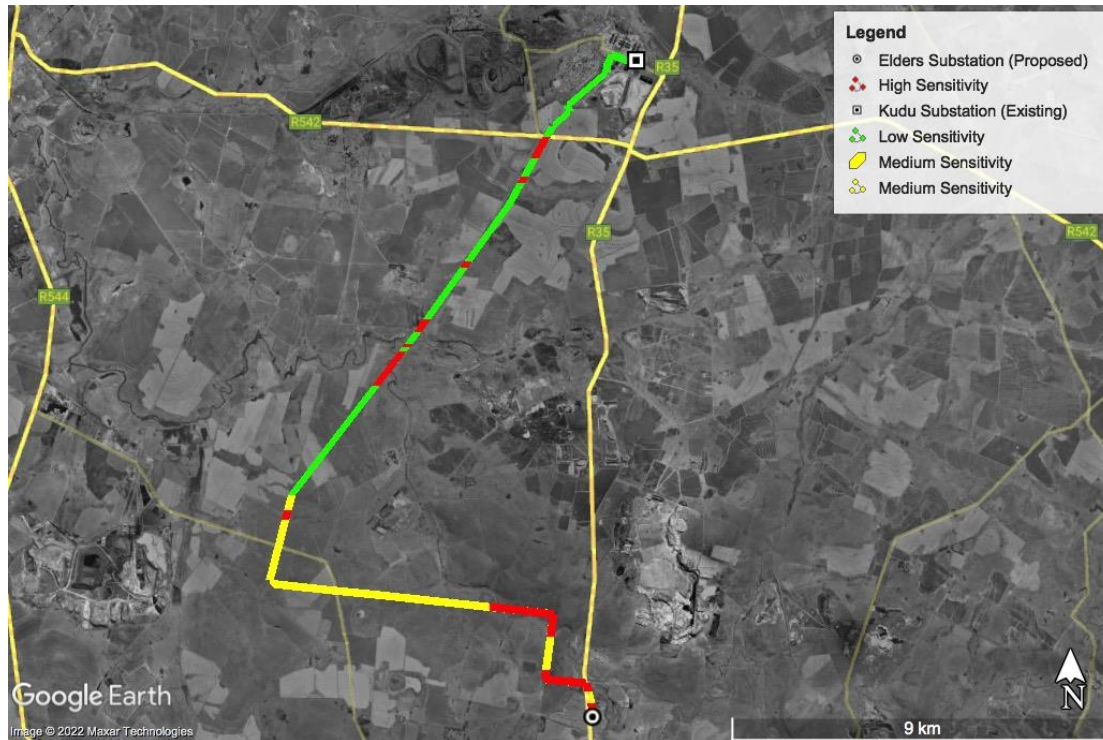


Figure 19: Avifauna Sensitivity Map

## Conclusions

The conclusions of the avifauna study are as follows:

- The study site is within the original extent of Eastern Highveld Grassland, which is a threatened veldtype / ecosystem with a status of 'Vulnerable'.
- Most of the power line route is within altered cultivated farmlands. The Elders Substation site is within a totally altered / transformed environment.
- There are a number of small streams, seasonal drainage lines, wetlands and the perennial Olifants River in the study area. There are a number of watercourse crossings.
- The study site is not within any national priority areas such as protected areas, important bird areas (IBAs), etc. However, the Olifants River is an important FEPA river.
- The main bird habitats identified are: Grasslands, watercourses, and farmlands (cultivated fields).
- Most of the new proposed power line will run directly next to existing large, transmission power lines, which greatly reduces the potential negative impacts on avifauna.
- The risk assessment ratings are the same for the Preferred Route and the Alternative Route in terms of potential negative impacts on avifauna. Therefore, in terms of Avifauna either route may be used.
- Taking all findings and recommendations into account it is the reasonable opinion of the author / specialist that the activity may be authorised. The project and related activities should be allowed to proceed.

## Recommendations

The recommendations of the avifauna study are as follows:

- All mitigating measures put forward in this report and other specialist reports must be implemented and included in the conditions of the EMP.

- Bird Flight Diverters (BFDs) must be installed as recommended. A 5m spacing along the earth wire (ground wire) is suggested. Alternative colours of black and white/yellow to be used.
- Bird perches must be placed on top of all steel-mono poles. On H-poles spikes must be installed along the horizontal to deter birds from perching or nesting on these beams / structures.
- Eskom approved 'bird-friendly' poles and other structures must be used.

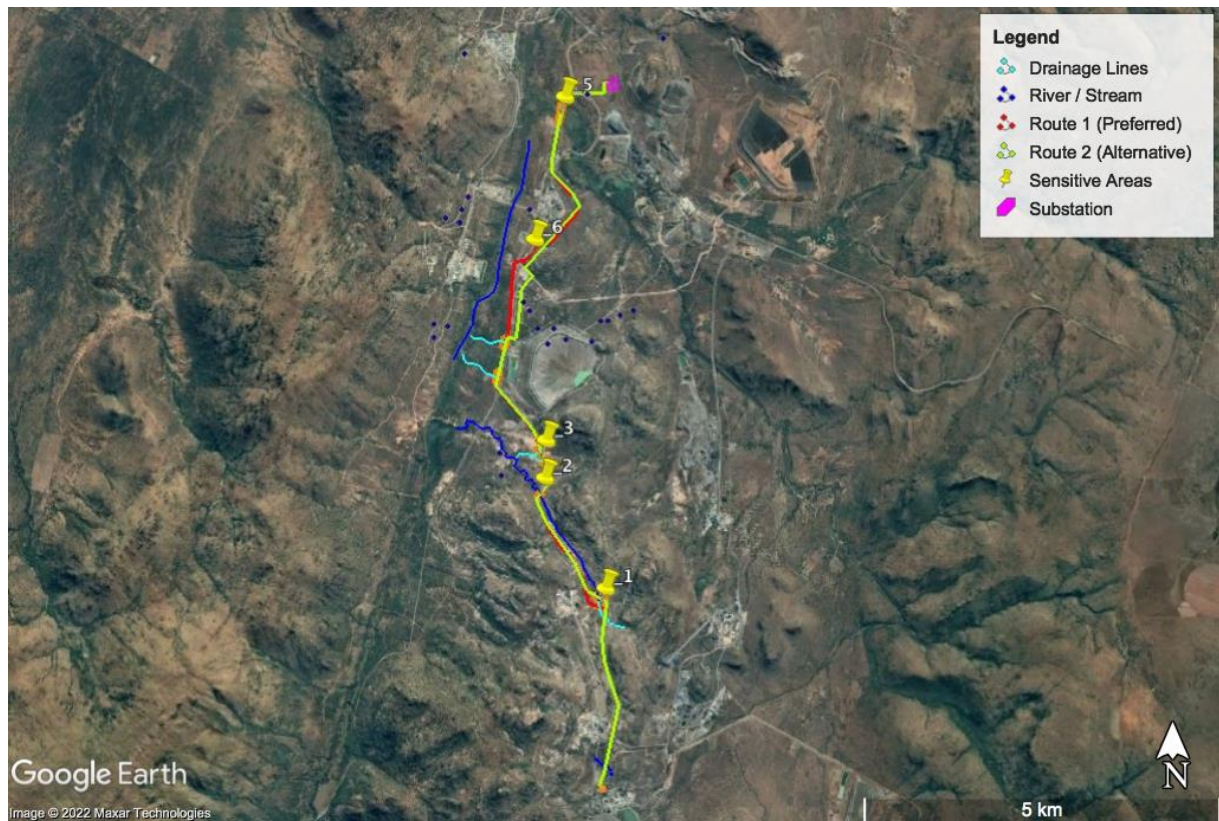


Figure 20: Sensitivity Map Avifauna

## Conclusions

The conclusions of the biodiversity study are as follows:

- The study site is within the original extent of Eastern Highveld Grassland, which is a threatened veldtype / ecosystem with a status of 'Vulnerable'.
- Most of the power line route is within altered cultivated farmlands. The Elders Substation site is within a totally altered / transformed environment.
- There are a number of small streams, seasonal drainage lines, wetlands and the perennial Olifants River in the study area. There are a number of watercourse crossings.
- The study site is not within any national priority areas such as protected areas, important bird areas (IBAs), etc. However, the Olifants River is an important FEPA river.
- The main bird habitats identified are: Grasslands, watercourses, and farmlands (cultivated fields).
- Most of the new proposed power line will run directly next to existing large, transmission power lines, which greatly reduces the potential negative impacts on avifauna.

- The risk assessment ratings are the same for the Preferred Route and the Alternative Route in terms of potential negative impacts on avifauna. Therefore, in terms of Avifauna either route may be used.
- Taking all findings and recommendations into account it is the reasonable opinion of the author / specialist that the activity may be authorised. The project and related activities should be allowed to proceed.

### Recommendations

The recommendations of the study are as follows:

- All mitigating measures put forward in this report and other specialist reports must be implemented and included in the conditions of the EMP.
- Bird Flight Diverters (BFDs) must be installed as recommended. A 5m spacing along the earth wire (ground wire) is suggested. Alternative colours of black and white/yellow to be used.
- Bird perches must be placed on top of all steel-mono poles. On H-poles spikes must be installed along the horizontal to deter birds from perching or nesting on these beams / structures.
- Eskom approved 'bird-friendly' poles and other structures must be used.

## 3 HERITAGE IMPACT ASSESSMENT

A Heritage Impact Assessment has been conducted by Beyond Heritage. Refer to Appendix D3 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:*

- The impact on heritage resources is considered low and the project can be authorised provided that the recommendations in this report are adhered to and based on the South African Heritage Resource Authority (SAHRA) 's approval.

*The report makes the following observations:*

- The route along the line is considered to be of low archaeological potential.
- The lack of significant heritage resources was confirmed during the site visit and finds were limited to demolished structures (KE001) and the ephemeral foundations of broken-down stone packed features or the remains of stones cleared from agricultural fields (KE002 & KE003);
- These features are of low significance and will not be directly affected by the project;
- According to the SAHRA Paleontological sensitivity map the study area is of low to very high paleontological significance and an independent study was conducted for this aspect. Bamford (2022) concluded that based on the site visit there were no potentially fossiliferous rocky outcrops, and NO FOSSILS were seen on the surface. Nonetheless, because some parts were not visible, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required;
- Two alternatives were assessed, and both are acceptable from a heritage point of view.

The study area follows two alternative powerlines from the existing Komati power station to the south to the proposed Elders substation along the R35. This substation is located in a crop field and is already disturbed from a heritage perspective. The proposed powerline mostly follow the existing powerline corridor from Komati to Kriel for about 12 km where the new proposed lines turn in an eastern direction.

The northern most section of the proposed line are within the Komati power station property near the existing ash dump and settling ponds that is also disturbed from a heritage point of view. The proposed line then continue along the edge of the Komati town towards the R542 where the lines cross into widespread agricultural fields to the proposed Elders substation.

Through the concessive years of ploughing this area is considered to be of low archaeological potential and this was confirmed during the survey and heritage finds were limited to demolished structures and the ephemeral foundations of broken-down stone packed features or the remains of stones cleared from agricultural fields. None of these features will be directly affected by the project. The recorded observations were numbered sequentially with the prefix KE for Kudu Elders. Selected features are illustrated in Figure 21. Recorded observations are briefly described in Table 16.

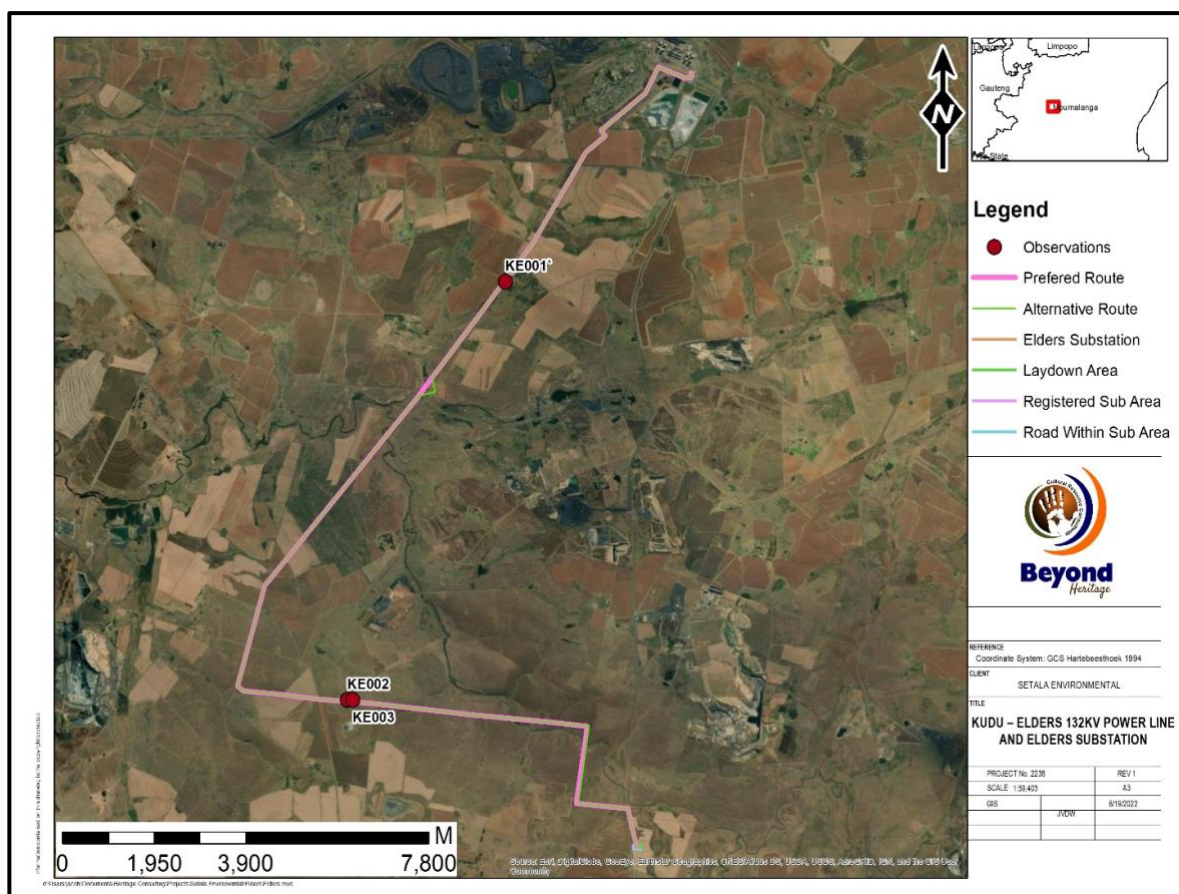


Figure 21. Site distribution in relation to the Project area.

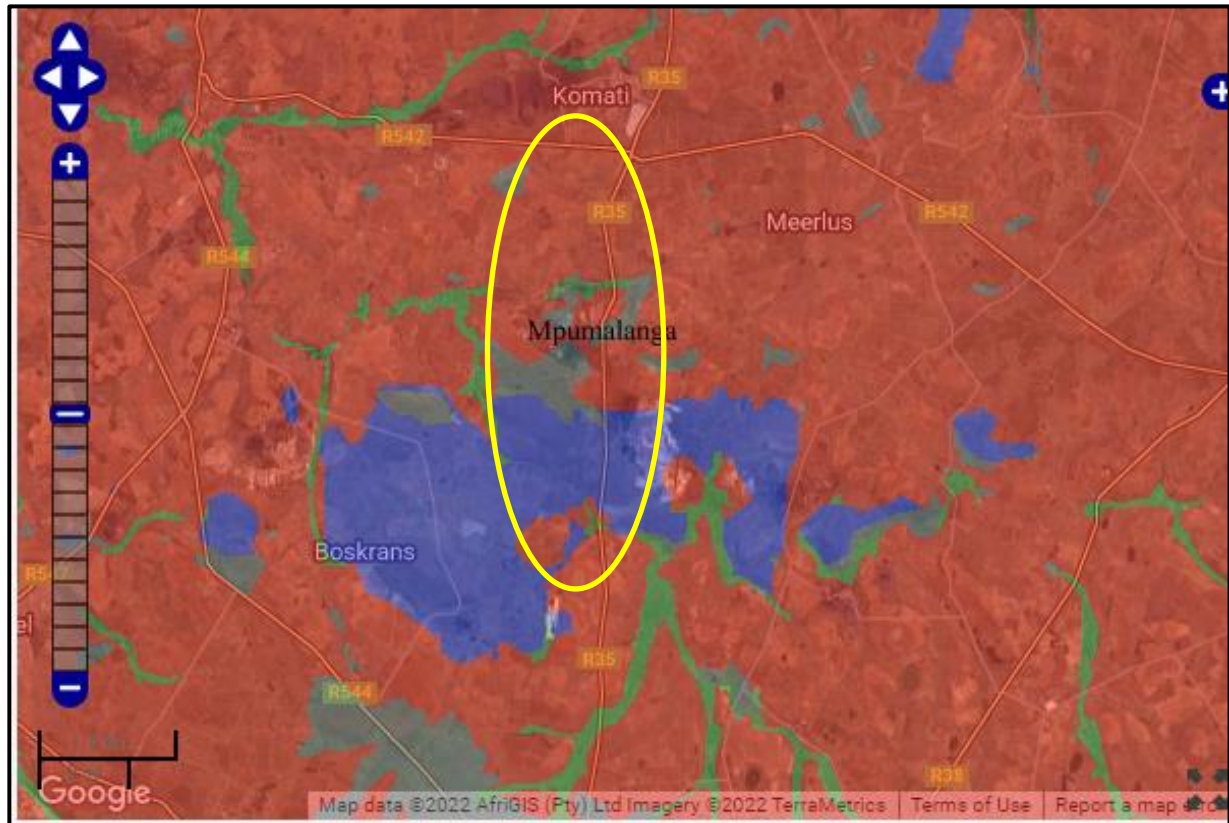
Table 16. Sites recorded in the study area.

Label	Location	Description	Significance
KE001	-26.13129, 29.439708	Remains of broken-down structures and foundations that seem to have been part of a farmstead. The features are spread out over an area measuring approximately 40 x 40m. These structures include the remains of a large farmhouse and various other foundations that relate to the farmstead such as water troughs. The entire farmstead is situated within a large thicket of trees.	Low significance GP C
KE002	-26.206454, 29.409677	Several ephemeral stone packed features over an area of ~ 20 x 20 m. These features are about 1.5m in length and may be the remnants of cleared stones from nearby agricultural fields. These features may also be the remnants of small, packed stone structures. The features are degraded and collapsed	Low significance GP C
KE003	-26.206393, 29.410494	Ephemeral remains of a possible packed stone foundation or the remnants of a packed stone structure. The feature is degraded and difficult to define. The site is situated near KE002	Low significance GP C

#### 4 PALEONTOLOGICAL SENSITIVITY

According to the SAHRA Paleontological map the study area is of low to very high paleontological significance (Figure 22) and an independent study was conducted for this aspect. Bamford (2022) found that the proposed route lies mostly along the existing powerline but the southern part is along farm boundaries. In the northern section is in the Vryheid Formation shales (Ecca Group, Karoo Supergroup) that could have fossil plants of the Glossopteris flora. The southern section is on non-fossiliferous rocks of the Selons River Formation (Rooiberg Group). The site visit and walk through confirmed that the route is either currently under cultivation or on fallow fields or cleared land. The vegetation is thick and on deep soils and some areas are waterlogged so have become inaccessible. There were no potentially fossiliferous rocky outcrops, and NO FOSSILS were seen on the surface. Nonetheless, because some parts were not visible, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, developer, environmental officer or other designated responsible person once excavations for pole foundations or infrastructure have commenced. Since the impact will be low to moderate, as far as the palaeontology is concerned, the project should be authorised.





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 palaeontological 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 22: Paleontological Sensitivity of the approximate study area (yellow polygon) is indicated on the SAHRA Palaeontological sensitivity map as insignificant.

5 COMBINED SENSITIVITY

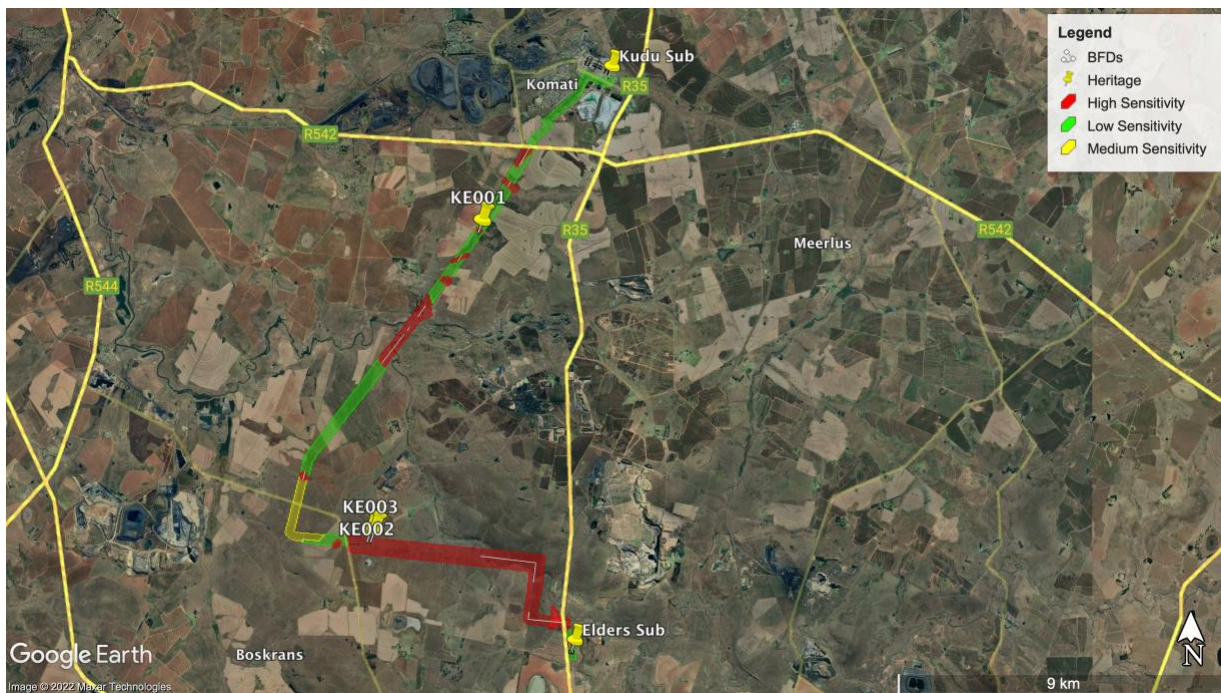


Figure 23: Combined Sensitivity map of the study area

Refer to Appendix A4 to A7 for sensitivity maps; as well as App A14 for the kml.

20 SPATIAL DEVELOPMENT TOOLS

Spatial development tools used included ArcGIS v.10.2; Google Earth Professional; SANBI’s BGIS MapViewer ([www.bgis.sanbi.org](http://www.bgis.sanbi.org)) and Garmin Maps.

These tools, along with relevant datasets such as vegetation types, rivers, Mpumalanga Biodiversity Sector Plan (2014), 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

The Study Site is not within any national priority areas, including protected areas and important bird areas (IBAs). However, the power line does however cross over the Olifants River, which is a FEPA River system. Although not all national priority areas in terms of NFEPA, all of the streams and wetlands are shown below in Figure 24.

National priority areas include formal and informal (private) protected areas (nature reserves); important bird areas (IBAs); RAMSAR sites; National fresh water ecosystem priority areas (NFEPA) and National protected areas expansion strategy focus areas (NPAES).

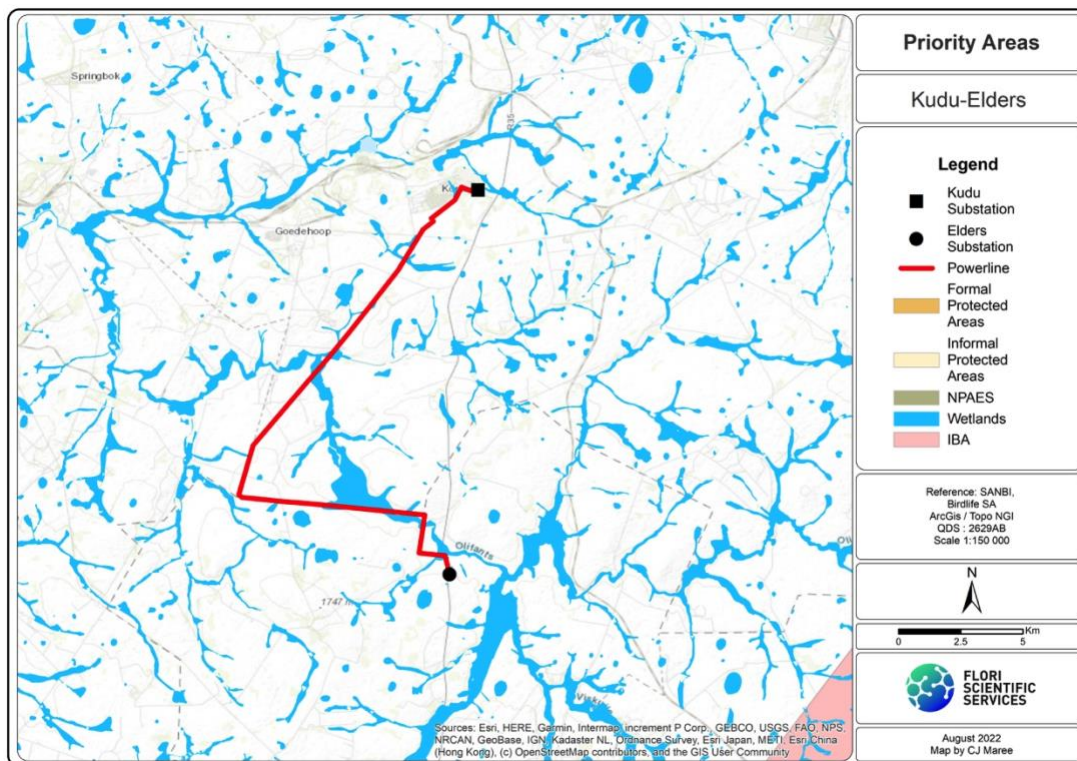


Figure 24: Priority Areas

2 MPUMALANGA BIODIVERSITY SECTOR PLAN

According to the latest Mpumalanga Biodiversity Sector Plan (2014) the southern section of the proposed power line route crosses through a critical biodiversity area (CBA). The northern section of the power line is not within a demarcated CBA. There are no Ecological Support Areas (ESAs) that are impacted on by the power line route (Figure 25). The demarcated CBA (Irreplaceable) is open degraded grassland and is also part of the area in which the Olifants River flows. The proposed Elders Substation site is not within a CBA or ESA.

Critical biodiversity areas (CBAs) are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services (SANBI, 2007). These form the key outputs of a systematic conservation assessment and are the biodiversity sectors inputs into multi-sectoral planning and decision-making tools. CBAs are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services (SANBI).

Ecological Support Areas (ESAs) are areas that are often seen as buffer areas for CBAs as well as corridors and connective areas between CBAs and/or other priority areas. ESAs are also often designated buffer and support areas along rivers and streams.

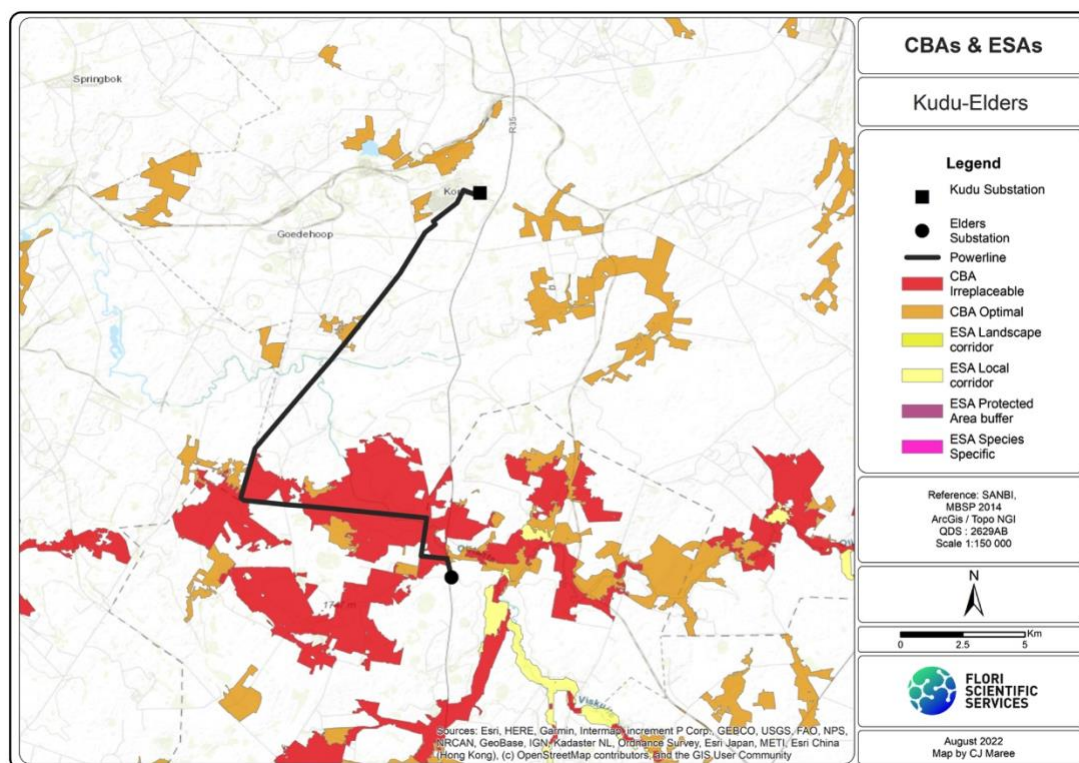


Figure 25: CBAs and ESAs

### 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.

According to the screening tool (accessed January 2022) the various sensitivities for the study site and immediate surroundings are as follows:

- Terrestrial biodiversity combined theme sensitivity: Very High.
- Aquatic biodiversity combined theme sensitivity: Very High along watercourses or else Low.
- Plant species theme sensitivity: Mix of Medium & Low.
- Animal species theme sensitivity: Medium.

During site investigations, the sensitivities, were assessed and ground-truthed. The site investigations agree with the sensitivities as shown in the screening assessment. However, the overall Terrestrial Biodiversity sensitivity was found to be Low (farmlands) and Medium (open grassland).

## 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"> <li>• Close to Elders sub site at the crossing of the line with the R35 in the vicinity of the Olifants River</li> <li>• On the alignment at the farm Kleinfontein</li> <li>• At the crossing of the R542 where the new line follows a corridor of 275 kV lines</li> </ul>
Date placed	29/06/2022
Publication name	Witbank News
Date published	01/07/2022

(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.

- Department of Agriculture, Rural Development, Land & Environmental Affairs (DARDLEA)
- Department of Water and Sanitation, Olifants Water Management Area (WMA2) QDA B11A and B11B
- SA Heritage Resources Agency
- Dept of Sports, Art and Culture, Heritage Resource 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
- Govan Mbeki Local Municipality
- Gert Sibande District Municipality

- Steve Tshwete Local Municipality
- Nkangala District Municipality
- Wildlife and Environmental Society of SA
- Endangered Wildlife Trust
- 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 29/06/2022 the documentation was submitted for comment to all I&APs.
- The due date for comment was 01/08/2022. 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. Landowners indicated their support for the proposed Route 1.

The affected landowners are as per below:

<b>Kudu-Elders Route 1</b>			
Item	Property	Ptn	Owner
1	Komati Power Station 56-IS	RE	Eskom
2	Goedehoop 46-IS	R/3	Thungela Operations Pty Ltd
3	Goedehoop 46-IS	8/3	Thungela Operations Pty Ltd
4	Goedehoop 46-IS	2	Thungela Operations Pty Ltd
5	Goedehoop 46-IS	RE	Thungela Operations Pty Ltd
6	Goedehoop 46-IS	4	Petrus Johannes Honeyborne
7	Kleinfontein 49-IS	10/1	Thungela Operations Pty Ltd
8	Kleinfontein 49-IS	RE/4	Thungela Operations Pty Ltd
9	Kleinfontein 49-IS	12/4	Cornelius Johannes Lourens
10	Kleinfontein 49-IS	8/4	Thungela Operations Pty Ltd
11	Schoonvlei 52-IS	2	Anglo American Inyosi Coal Pty Ltd
12	Middelkraal 50-IS	8/3	South African National Roads Agency Ltd
13	Middelkraal 50-IS	R/3	Anglo American Inyosi Coal Pty Ltd

<b>Kudu-Elders Route 2</b>			
Item	Property	Ptn	Owner
1	Komati Power Station 56-IS	RE	Eskom
2	Goedehoop 46-IS	R/3	Thungela Operations Pty Ltd
3	Goedehoop 46-IS	8/3	Thungela Operations Pty Ltd
4	Goedehoop 46-IS	2	Thungela Operations Pty Ltd
5	Goedehoop 46-IS	RE	Thungela Operations Pty Ltd
6	Kleinfontein 49-IS	10/1	Thungela Operations Pty Ltd
7	Kleinfontein 49-IS	RE/4	Thungela Operations Pty Ltd

8	Kleinfontein 49-IS	12/4	Cornelius Johannes Lourens
9	Kleinfontein 49-IS	8/4	Thungela Operations Pty Ltd
10	Middelkraal 50-IS	R/14	Umcebo Prop Pty Ltd
11	Middelkraal 50-IS	R/2	Umcebo Prop Pty Ltd
12	Middelkraal 50-IS	8/3	South African National Roads Agency Ltd
13	Middelkraal 50-IS	R/3	Anglo American Inyosi Coal Pty Ltd

### 3 MEETINGS AND SITE VISITS

#### *Site visit with key stakeholders*

- 29/06/2022 - Eskom Distribution, Mpumalanga Operating Unit with project team

#### *Public meeting/ Open day*

- The COVID-19 Epidemic has a significant impact on the undertaking of EIA processes and in specific the Public Participation Processes.
- In order to comply with social distancing policies, the opportunity to partake in the Public Participation Process, without face-to-face contact, is provided.
- The I&APs are provided with various options to provide comment / request more information. In writing, via fax or email, and verbally, via telephone calls, text messages, WhatsApp, zoom or teams sessions.
- Engagements to be held virtual via teams/zoom, telephone conversations, text messages etc.
- Copies of the invitations to comment, included as Appendix E2c of the final BAR.
- The interested and affected parties all provided comment via email and no request for a physical meeting was received.

### 4 DISTRIBUTION OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENT

On 12/09/2022 notification of the availability of the Draft Basic Assessment Report (DBAR) was submitted to all I&APs. (Proof in Appendix E2c of the final BAR).

The DBAR is available for comment on the Setala website using a given link. The comment period is for 30 days until 13/10/2022.

Hard copies and/or electronic copies of the DBAR are submitted to the following key stakeholders:

- Department of Agriculture, Rural Development, Land & Environmental Affairs (DARDLEA)
- Department of Water and Sanitation, Olifants Water Management Area (WMA2) QDA B11A and B11B
- Govan Mbeki Local Municipality
- Gert Sibande District Municipality
- Steve Tshwete Local Municipality
- Nkangala District Municipality
- SA Heritage Resources Agency (via Sahriss)

### 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:

- Pending

Key stakeholders from whom comments have been received:

- Sasol Gas Limited

## 6 CONCLUSION OF PUBLIC PARTICIPATION PROGRAMME

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

Activity	Description and Purpose
<b>Pre-Application</b>	
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 29/06/2022 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 01/08/2022. See Appendix E2a for the BID and Registration form.
Advertisement of the Project and Erection of Site Notices	On 29/06/2022 the Project was advertised in a local newspaper, the Witbank News. See proof of notice in Appendix E1a. A Site notice has been placed at various locations on 29/06/2022. 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.
<b>BA Phase</b>	
Release of draft Basic Assessment Report for Public Comment	The draft BA Report was released for the required 30-day public comment period: Dates of 12/09/2022 to 13/10/2022. Notifications were submitted to all stakeholders on the database and included details of how to engage in providing comment. The DBAR was available for comment on the Setala website using a given link. Proof attached as Appendix E2c of the FBAR.
Development of a Comments and Response Report	All comments received are recorded into a Comments and Response Report. See attached as Appendix E6.
Public review	The COVID-19 Epidemic has a significant impact on the undertaking of EIA processes and in specific the Public Participation Processes. In order to comply with social distancing policies, the opportunity to partake in the Public Participation Process, without face-to-face contact, is provided. The I&APs are provided with various options to provide comment / request more information. In writing, via fax or email, and verbally, via telephone calls, text messages, WhatsApp, zoom or teams sessions. All comments received, along with responses, included in the final BAR as Appendix E3.
Submission of final Basic Assessment Report to Environmental Authority	Subsequently the final BAR to be submitted to DFFE. The final BAR will include all concerns raised to the DBAR, and the responses thereto.
<b>Environmental Decision</b>	
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:

- (a) Nature: A brief written statement of the environmental aspect being impacted upon by a particular action or activity.
- (b) 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.
- (c) Duration: Indicates what the lifetime of the impact will be.
- (d) Intensity: Describes whether an impact is destructive or benign.
- (e) Probability: Describes the likelihood of an impact actually occurring; and
- (f) 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 17: Criteria to be used for rating of impacts

Criteria	Description			
Extent	<b>National (4)</b> The whole of South Africa	<b>Regional (3)</b> Provincial and parts of neighbouring provinces	<b>Local (2)</b> Within a radius of 2 km of the construction site	<b>Site (1)</b> Within the construction site
Duration	<b>Permanent (4)</b> 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	<b>Long-term (3)</b> 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	<b>Medium-term (2)</b> The impact will last for the period of the construction phase, where after it will be entirely negated	<b>Short-term (1)</b> The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than the construction phase
Intensity	<b>Very High (4)</b>	<b>High (3)</b>	<b>Moderate (2)</b>	<b>Low (1)</b>

	Natural, cultural and social functions and processes are altered to extent that they permanently cease	Natural, cultural and social functions and processes are altered to extent that they temporarily cease	Affected environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
<b>Probability of occurrence</b>	<b>Definite (4)</b> Impact will certainly occur	<b>Highly Probable (3)</b> Most likely that the impact will occur	<b>Possible (2)</b> The impact may occur	<b>Improbable (1)</b> 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 18: 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.

Kudu – Elders Route 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
<b>Impact on the Natural Habitat Design</b> Insensitive design of the power line routes can cause a negative impact on the natural habitat of	NEGATIVE MEDIUM	<ul style="list-style-type: none"> <li>Site-specific measures in terms of biodiversity as identified by Johannes Maree (Tel 082 564 1211), must be included in the contract with the</li> </ul>	NEGATIVE LOW	LOW

<p>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 thereof is not being supported by the development proposal.</p> <p><u>The development site</u> The ecological impacts of the two power line route alternatives are similar in terms of potential impacts on watercourses and other habitats. The main difference is in the distance (m) across or near to wetlands and dams. For the Preferred Route the distance is shorter than for the Alternative route. This slight difference gives the Preferred Route a slightly better rating in terms of risks to birds.</p>		<p>Contractor and implemented by the Contractor during the construction phase.</p> <ul style="list-style-type: none"> <li>The proposed Powerline Route is Route 1, due to slightly lower impacts.</li> </ul>		
<b>INDIRECT IMPACTS</b>				
<p>No indirect impacts were identified during the planning and design phase.</p>				
<b>CUMULATIVE IMPACTS</b>				
<p>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.</p>				

<b>Kudu – Elders Route Alternative 2</b>				
<b>DIRECT IMPACTS</b>				
<p><b>Impact on the Natural Habitat</b> 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.</p> <p><u>The development site</u> As mentioned, the main difference is in the distance (m) across or near to wetlands and dams. Route 2 runs for a longer distance near water courses and this gives the Preferred</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<p>NEGATIVE MEDIUM</p>	<p>MEDIUM</p>

route (Route 1) a slightly better rating in terms of risks to birds.				
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**

Kudu – Elders Route 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
<p><b>Impact on the vegetation</b></p> <p>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 removal represent a loss of seed and organic matter, but it is also a loss of protection to plants and small animals. Insensitive vegetation</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>Detail mitigation measures are stipulated in the EMPr and include the following:</li> <li>Ensure as small a footprint as possible during the construction phase.</li> <li>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.</li> <li>All excess materials brought onto site for construction to be removed after construction, but as part of the construction phase.</li> <li>Proper rubbish/waste bins to be provided. These to be emptied weekly</li> </ul>	<p>NEGATIVE MEDIUM</p>	<p>LOW</p>

<p>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>There are no highly sensitive habitats, or no-go zones present with the proposed power line servitude itself, with the exception of watercourses.</p>		<p>and the waste to be removed to an official waste disposal site.</p> <ul style="list-style-type: none"> <li>• Rehabilitation plan for disturbed temporary set up areas to be compiled and implemented as part of the construction phase.</li> <li>• Special attention must be given to the rehabilitation of temporary construction and set up areas.</li> <li>• Re-seeding of bare areas with local indigenous grasses to be part of the rehabilitation plan. No exotic species to be used for rehabilitation.</li> <li>• Only existing gravel / sand roads to be used by heavy vehicles during the construction phase.</li> <li>• Access roads to be maintained at all times.</li> <li>• Much of the natural grassland vegetation in the study area has been transformed or altered by years of farming practices (mainly in the form of ploughing and cultivation of dryland maize production). Smaller open grassland areas are generally used for the grazing of livestock such as cattle, which also puts pressure on natural grasslands, along with regular winter veldfires. The most natural occurring Eastern Highveld Grassland is along the Olifants River in the south of the study site area for the power line route.</li> <li>• Most trees observed in the study area are the invasive alien blackwattle (<i>Acacia mearnsii</i>) No naturally occurring trees or shrubland is present in the proposed power line servitude or the substation site.</li> <li>• The vegetation of the Elders Substation site has been totally transformed by years of ploughing and cultivating of the area. No natural vegetation remains.</li> <li>• The likelihood is low that any RDL or ODL plants will be impacted. None appear to be directly within the power line servitude.</li> <li>• No red data listed (RDL) floral species were observed in the study area and none are expected to occur. A few orange data listed (ODL) species were observed, but most if not all can be avoided.</li> <li>• These ODL species include: <i>Hypoxis hemerocallidea</i> and <i>Crinum bulbispermum</i></li> <li>• However, should any be noticed during construction then the ECO and/or Specialist must first be contacted for advice on how to move forward. If any suspicious plants are found that need to be moved or destroyed then once again the ECO and/or specialist must first be contacted.</li> </ul>		
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		<ul style="list-style-type: none"> <li>Any priority species encountered must be identified and rescue prior to any excavation or construction activities.</li> <li>The footprint of the power line is small and there will not be significant, lasting impacts on vegetation.</li> </ul>		
<p><b>Impacts on avifauna</b></p> <p>Disturbance Collisions Electrocutions</p> <p><u>The development site</u> The study site is not within any national priority areas such as protected areas, important bird areas (IBAs), etc. However, the Olifants River is an important FEPA river.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>A steel mono-pole (structure) to be used for the new 132kV line, that reduces bird collisions and electrocutions.</li> <li>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 along with the elevated power line which creates potential collisions / bird-strikes.</li> <li>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.</li> <li>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.</li> <li>Eskom will use the latest structure designs that further help reduce bird collisions and electrocutions.</li> <li>No interaction is allowed with any birds, even common species.</li> <li>Should a nest be found during the construction phase, work in that particular spot must be halted and a bird specialist consulted. Any nesting sites found should be cordoned off with tape and signs and declared a 'no-go' zone.</li> <li>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.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Impacts on fauna</b></p> <ul style="list-style-type: none"> <li>Noise and vibration during construction</li> <li>Loss of habitat</li> </ul> <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"> <li>All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993).</li> <li>No poaching of wildlife or selling of firewood will be allowed.</li> <li>No animals or birds may be fed, disturbed, hunted or trapped.</li> <li>During the summer months (rainy season) staff must be continually made aware of being cautious and vigilant in encountering snakes. No snakes encountered may be killed and must be removed by a specialist on site or called in when required.</li> <li>Contractors and staff are not allowed to catch fish in the nearby rivers and streams.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Impact on Water Sources</b></p> <p>During construction, the risk of pollution of surface and</p>	<p>NEGATIVE HIGH</p>	<ul style="list-style-type: none"> <li>Mitigation measures in the Environmental Management Programme include measures to</li> </ul>	<p>NEGATIVE MEDIUM</p>	<p>LOW</p>

<p>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 a number of small streams, seasonal drainage lines, wetlands and the perennial Olifants River in the study area. There are a number of watercourse crossings.</p>		<p>ensure acceptable construction practices to minimise or avoid the risk of contamination of water sources. These include:</p> <p><u>Construction Site</u></p> <ul style="list-style-type: none"> <li>• No heavy vehicles are allowed to drive through watercourses, unless on existing gravel and farm roads.</li> <li>• The only buffer zones required for the project are at watercourse crossings. A 50m wide buffer zone, from the edge of riverbanks, stream banks, and temporary wetland zones have been demarcated and no pylons / poles are allowed to be planted within these buffer zones, unless absolutely necessary. Doing so may trigger the need for a General Authorisation (GA) process. Even if a GA or WUL is granted all effort must still be made to keep poles out of buffered areas to protect the integrity of the watercourses buffered.</li> <li>• Temporary access roads across watercourses will have to be constructed. For such an action a GA will be required.</li> <li>• 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.</li> <li>• No temporary accommodation or temporary storage facilities may be setup within 100m of the any watercourse.</li> <li>• Water may not simply be extracted from nearby rivers for construction work. Proper permission and/or permits must be obtained from local authorities and/or landowners</li> <li>• No excess excavated soils may be stockpiled within natural grassland areas.</li> <li>• Ensure as small a footprint as possible during the construction phase.</li> <li>• 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.</li> <li>• 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.</li> </ul> <p><u>Diesel, hydraulic fluid and lubricants</u></p> <ul style="list-style-type: none"> <li>• Minimise on-site storage of petroleum products;</li> <li>• Ensure measures to contain spills readily available on site (spill kits).</li> <li>• All petrochemical leaks and spills must be appropriately contained and</li> </ul>		
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		<p>disposed of at a licensed waste disposal site.</p> <p><u>Construction Vehicles</u></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• 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.</li> <li>• All construction vehicles should be serviced on a regular basis to minimise the risk of oil spillage on site.</li> <li>• Servicing of vehicles or equipment must take place off-site at appropriate workshop facilities.</li> <li>• 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.</li> </ul> <p><u>Construction site domestic waste and sewage</u></p> <ul style="list-style-type: none"> <li>• Deposit solid waste in containers and dispose at authorised waste disposal sites regularly or as per the Waste Management Plan.</li> <li>• Dispose of liquid waste (grey water) with sewerage.</li> <li>• Temporary install appropriate ablution facilities.</li> <li>• Preferably utilise onsite ablution facilities or chemical toilets.</li> <li>• <u>Construction site inert waste (waste concrete, reinforcing rods, waste bags, wire, timber etc)</u></li> <li>• Ensure compliance with stringent daily clean up requirements on site.</li> <li>• Dispose at authorised waste disposal sites.</li> </ul> <p><u>Construction site hazardous waste</u></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Material safety data sheets (MSDSs) are to be clearly displayed for all hazardous materials.</li> <li>• 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.</li> <li>• Employees should be provided with absorbent spill kits and disposal containers to handle spillages.</li> </ul>		
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		<ul style="list-style-type: none"> <li>• Train employees and contractors on the correct handling of spillages and precautionary measures that need to be implemented to minimise potential spillages.</li> <li>• Employees should record and report any spillages to the responsible person.</li> <li>• An Emergency Preparedness and Response Plan will be developed and implemented as part of the existing emergency response plan, should and incident occur.</li> <li>• Access to storage areas on site must be restricted to authorised employees only.</li> <li>• Contractors will be held liable for any environmental damages caused by spillages.</li> </ul>		
<p><b>Topographical Impacts</b></p> <p>Alteration of topography due to stockpiling of soil, building material and debris and waste material on site.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• All stockpiles must be restricted to designated areas and are not to exceed a height of 2 metres.</li> <li>• Stockpiles created during the construction phase are not to remain during the operational phase.</li> <li>• The contractor must be limited to clearly defined access routes to ensure that sensitive and undisturbed areas are not disturbed.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Impact of erosion</b></p> <p>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.</p> <p><u>The development site</u> The topography of the study area is open flat to slightly undulating grassland plains with a few scattered, low rocky hills and shallow, broad valleys in which small seasonal streams are typically found. Most of the study site is within open farmlands that are regularly ploughed and cultivated with the main crop being the production of dryland maize (mielies). The average height above sea level across the study site (power line route) is around 1 595m, with a maximum and minimum elevation of around 1 642m and 1 536m, respectively. The average</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Other factors which should be taken into account during the construction phase are the following:</li> <li>• Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.</li> <li>• 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.</li> <li>• 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.</li> <li>• The total area of exposed soil must be reduced during the rainy season.</li> <li>• Specifications for topsoil storage and replacement to ensure sufficient soil coverage as soon as possible after construction must be implemented.</li> <li>• Rehabilitation plan for disturbed temporary set up areas to be</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>

<p>gradient (slope) is low at around 2%.</p>		<p>compiled and implemented as part of the construction phase.</p> <ul style="list-style-type: none"> <li>• Special attention must be given to the rehabilitation of temporary construction and set up areas.</li> <li>• Re-seeding of bare areas with local indigenous grasses to be part of the rehabilitation plan. No exotic species to be used for rehabilitation.</li> </ul>		
<p><b>Soils Impacts</b> 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.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• Strip topsoil prior to any construction activities.</li> <li>• Reuse topsoil to rehabilitate disturbed areas.</li> <li>• Topsoil must be kept separate from overburden and must not be used for building purposes or maintenance or access roads.</li> <li>• Minimise the clearance of vegetation to avoid exposure of soil.</li> <li>• Protect areas susceptible to erosion with mulch or a suitable alternative.</li> <li>• Implement the appropriate topsoil and stormwater runoff control management measures as per the EMPr to prevent the loss of topsoil.</li> <li>• Topsoil should only be exposed for minimal periods of time and adequately stockpiled to prevent the topsoil loss and run-off.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Air Quality Impacts</b>  Dust and emissions during construction generated by debris handling and debris piles, truck transport, bulldozing, general construction.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Loads could be covered to avoid loss of material in transport, especially if material is transported off site.</li> <li>• Dust and mud should be controlled at vehicle exit and entry points to prevent the dispersion of dust and mud beyond the site boundary.</li> <li>• A speed limit of 40 km/hr should be set for all vehicles travelling over exposed areas.</li> <li>• During the transfer of materials, drop heights should be minimised to control the dispersion of mater being transferred.</li> <li>• The height of all stockpiles on site should be a maximum of 2m.</li> <li>• Use of dust retardant road surfacing if required due to the exceedance of Air Quality Guidelines.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Impacts associated with construction activities such as noise, and safety</b>  The negative impact of noise, generally associated with construction activities, are temporary, occurring mostly during the construction phase.</p>	<p>NEGATIVE MEDIUM</p>	<p><u>Noise mitigation measures</u></p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Construction activities may be undertaken on Sundays in cases of emergencies.</li> </ul>	<p>NEGATIVE MEDIUM</p>	<p>LOW</p>

<p>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.</p>		<ul style="list-style-type: none"> <li>• Provide all equipment with standard silencers.</li> <li>• Maintain silencer units in vehicles and equipment in good working order.</li> <li>• All earth moving vehicles and equipment must be regularly maintained to ensure their integrity and reliability.</li> <li>• Construction staff working in area where the 8-hour ambient noise levels exceed 85 dBA must have the appropriate Personal Protective Equipment (PPE).</li> <li>• All operations should meet the noise standard requirements of the Occupational Health and Safety Act (Act No. 85 of 1993).</li> </ul> <p><u>Safety mitigation measures</u></p> <ul style="list-style-type: none"> <li>• The area affected by construction must be fenced prior to any activities taking place.</li> <li>• All excavated areas must be clearly marked and barrier tape must be placed around them for safety purposes.</li> <li>• Great care must be taken not to leave any excavated holes open or unfenced over night as there are numerous cattle and other livestock grazing and moving in and through the general area.</li> <li>• 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.</li> </ul>		
<p><b>Traffic (construction vehicles)</b></p> <p>The construction phase is likely to generate additional traffic in terms of construction vehicles and heavy vehicles delivering materials to the site. However, the number of vehicles will be minimal.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Signs should be erected in the vicinity of the site.</li> <li>• Construction vehicles are to avoid main roads during peak traffic hours.</li> <li>• All vehicles entering the Site are to be roadworthy.</li> <li>• When using heavy or large vehicles / equipment, “spotters” are to be present to assist the driver with his blind spots.</li> <li>• Any incident or damage to a vehicle must be reported immediately.</li> </ul>	<p>NEGATIVE MEDIUM</p>	<p>LOW</p>
<p><b>Impact of Labourers</b></p> <p>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</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• 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.).</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>

<p>damage to the environment if not mitigated properly.  <u>The development site</u>                  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>		<ul style="list-style-type: none"> <li>Accommodation for labourers must either be limited to guarding personnel on the construction site (with labourers transported to and from existing neighbouring towns) or a separate fenced and controlled area where proper accommodation and relevant facilities are provided.</li> <li>No temporary accommodation or temporary storage facilities may be setup within 100m of the any watercourse.</li> <li>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.</li> <li>If possible all labour should be sourced locally.</li> <li>Contractors and their families may not stay on site.</li> <li>No informal settlements will be allowed.</li> </ul>		
<p><b>Safety</b>                   Public safety during construction.</p>	<p>NEGATIVE                  MEDIUM</p>	<ul style="list-style-type: none"> <li>Members of the public adjacent to the construction site should be notified of construction activities in order to limit unnecessary disturbance or interference.</li> <li>Construction activities will be undertaken during daylight hours and only on Sundays in cases of emergency.</li> </ul>	<p>NEGATIVE                  LOW</p>	<p>LOW</p>
<p><b>Safety</b>                   Construction staff safety during construction.</p>	<p>NEGATIVE                  MEDIUM</p>	<ul style="list-style-type: none"> <li>Ensure the appointment of a Safety Officer to continuously monitor the safety conditions during construction.</li> <li>All construction staff must have the appropriate PPE.</li> <li>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.</li> <li>Report and record any environmental, health and safety incidents to the responsible person.</li> </ul>	<p>NEGATIVE                  MEDIUM</p>	<p>LOW</p>
<p><b>Impact on Cultural Heritage Resources</b>                   No known features will be directly impacted on by the project.                   There is always a probability that additional archaeological resources might be identified during excavations.</p>	<p>NEGATIVE                  LOW</p>	<ul style="list-style-type: none"> <li>The lack of significant heritage resources was confirmed and finds were limited to demolished structures (KE001) and the ephemeral foundations of broken-down stone packed features or the remains of stones cleared from agricultural fields (KE002 &amp; KE003);</li> <li>These features are of low significance and will not be directly affected by the project.</li> <li>A 'Chance find Procedure' should be followed:                         <ul style="list-style-type: none"> <li>If there are any new heritages resources are discovered during construction and operation phases of the proposed development, then a professional archaeologist or palaeontologist, depending on the nature of the finds, must be</li> </ul> </li> </ul>	<p>NEGATIVE                  LOW</p>	<p>LOW</p>

		<p>contracted as soon as possible to inspect the findings at the expense of the developer.</p> <ul style="list-style-type: none"> <li>If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999).</li> <li>The applicant/ ECO may contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/ Phillip Hine 021 202 8654).</li> <li>If any unmarked human burials are uncovered and the archaeologist called in to inspect the finds and/or the police find them to be heritage graves, then mitigation may be necessary and the SAHRA Burial Grounds and Graves (BGG) Unit must be contacted for processes to follow (Thingahangwi Tshivase/Mimi Seetelo 072 802 1251).</li> </ul>		
<p><b>Impact on Palaeontological Resources</b></p> <p>According to the SAHRA Paleontological sensitivity map the study area is of low to very high paleontological significance and an independent study was conducted for this aspect. Bamford (2022) concluded that based on the site visit there were no potentially fossiliferous rocky outcrops, and NO FOSSILS were seen on the surface. Nonetheless, because some parts were not visible, a Fossil Chance Find Protocol should be added to the EMPr.</p>	<p>NEGATIVE LOW</p>	<ul style="list-style-type: none"> <li>In the unlikely event that fossils are uncovered during construction then construction must cease within the immediate vicinity, a buffer of 30 m must be established, and a palaeontologist called in to inspect the finds.</li> <li>The palaeontologist must obtain a section 35(4) permit in terms of NHRA and Chapter IV NHRA Regulations, before any fossils are collected.</li> <li>If the newly discovered heritage resources prove to be of archaeological or palaeontological significance, a Phase 2 rescue operation may be required at the expense of the developer. Mitigation will only be carried out after the archaeologist or palaeontologist obtains a permit in terms of section 35 of the NHRA (Act 25 of 1999).</li> <li>The applicant/ ECO may contact SAHRA APM Unit for further details: (Nokukhanya Khumalo/ Phillip Hine 021 202 8654).</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Existing services and infrastructure</b></p> <p>Damage to the existing services and infrastructure during the construction phase and disruptions in services (i.e. Telkom lines, electricity) during the construction phase.</p>	<p>NEGATIVE LOW</p>	<ul style="list-style-type: none"> <li>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.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>

<p><b>Waste Management</b></p> <p><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.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• Develop a central waste temporary holding site to be used during construction. This site should comply with the following:</li> <li>• Skips for the containment and disposal of waste that could cause soil and water pollution, i.e. paint, lubricants, etc.;</li> <li>• Small lightweight waste items should be contained in skips with lids to prevent wind littering;</li> <li>• Bunded areas for containment and holding of dry building waste.</li> <li>• These areas shall be predetermined and located in areas that is already disturbed.</li> <li>• These areas shall not be in close proximity of any watercourse.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><u>Sewage waste</u> Generation and disposal of sewage waste of temporary construction toilets.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• On-site chemical toilets will be provided for domestic purposes during construction phase.</li> <li>• The contractors will be responsible for the maintenance of the chemical toilets.</li> <li>• No temporary facilities or portable toilets to be setup within 50m of any watercourse.</li> <li>• No French drain systems may be installed.</li> <li>• Should any spills or incidents occur; the material will be cleaned up immediately and disposed off appropriately.</li> <li>• All incidents must be reported to the responsible site officer as soon as it occurs.</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>
<p><b>Economic impacts</b></p> <p>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 employment is an achievement in South Africa.</p>	<p>POSITIVE HIGH</p>	<ul style="list-style-type: none"> <li>• Employment opportunities will be generated.</li> <li>• All labour (skilled and unskilled) and contractors should be sourced locally where possible.</li> <li>• A labour and recruitment policy must be developed, displayed and implemented by the contractor.</li> <li>• Recruitment at the construction site will not be allowed.</li> <li>• Where possible, labour intensive practices (as opposed to mechanised) should be practiced.</li> <li>• The principles of equality, BEE, gender equality and non-discrimination will be implemented.</li> </ul>		
<b>INDIRECT IMPACTS</b>				
<p>No indirect impacts were identified during the construction phase.</p>				
<b>CUMULATIVE IMPACTS</b>				
<p><b>Visual Impact</b> The development of the site would contribute to the cumulative effects of the</p>		<p>Project should adhere to the stipulated mitigation measures to limit impact to the natural habitat, to surface water, erosion etc.</p>		

<p>gradual transformation of the area from an area with part rural landscape components to an area dominated by infrastructure.</p> <p><u>Development site</u> The landcover or landuse of the study site is a mix of mostly cultivated farmland and open grassland plains. The proposed Elders substation location is within existing cultivated farmland. The main farming practices in the area are cultivated, dryland maize production and livestock grazing. The existing Kudu Substation is within the property of the Komati Power Station. The new line will run for approximately half of the route adjacent to a corridor of 275kV powerlines. In other words, the power line servitude will be mostly within or next to disturbed areas.</p>				
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Kudu – Elders Route 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.				
<p><b>Impact on watercourses</b></p> <p>Route 2 runs for a longer distance (m) across or near to wetlands and dams. This slight difference of 150m gives the Preferred Route a slightly better rating in terms of risks to birds. However, in reality, the final risks are the same.</p>	<p>NEGATIVE MEDIUM</p>	<ul style="list-style-type: none"> <li>• Buffer zones along watercourses have been recommended. Where possible, the poles (pylons) of the power lines must be placed at a minimum of 50m away from the edge of the watercourse. The edge of a watercourse is seen as the edge of the river or stream bank (in case of rivers and streams), and the edge of the temporary zone (in case of wetlands). Power lines have very little to no long-term negative impact on watercourses, even if poles are on the edge of them. However, to ensure that the integrity of the watercourses is maintained, especially the edges of stream banks during the construction phase a more than adequate 50m wide buffer zone has been recommended.</li> <li>• It will be possible to maintain this 50m buffer zone at most of the crossings and nearby areas, with the possible exception of the crossing at the Olifants River and associated floodplain wetland area.</li> <li>• It is more than likely that a General Authorisation (GA) process will be</li> </ul>	<p>NEGATIVE LOW</p>	<p>LOW</p>

		<p>required for the project, unless the span of the power line will be able to clear the wetland area plus the associate buffer zone. If not, the applicant must apply for a GA / water use.</p> <ul style="list-style-type: none"> <li>• Notwithstanding, the buffer zones must be delineated and maintained as far as possible. That is, they must be seen as ‘no-go zones’ in terms of the general movement of people and vehicles; placement of portable toilets; laydown areas; temporary storage areas, etc.</li> <li>• No watercourses (streams, drainage lines, rivers) may be impeded or impounded during the construction phase or at any stage of the project at all.</li> <li>• Erosion and potential siltation of watercourses must be monitored at all times during the construction phase of the project.</li> </ul>		
<b>INDIRECT IMPACTS</b>				
No indirect impacts were identified during the construction phase.				
<b>CUMULATIVE IMPACTS</b>				
No cumulative impacts were identified during the construction phase.				

<b>NO GO ALTERNATIVE</b>				
<b>DIRECT IMPACTS</b>				
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.				
<b>INDIRECT IMPACTS</b>				
No indirect impacts were identified during the construction phase.				



CUMULATIVE IMPACTS				
No cumulative impacts were identified during the construction phase.				

**3 OPERATIONAL PHASE**

Kudu – Elders Route 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
<b>Impact of alien vegetation</b>	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.		
<b>Impact on avifauna</b>	NEGATIVE MEDIUM	<ul style="list-style-type: none"> <li>Maintenance access roads to be limited to car tracks or small gravel roads under the power lines (This does not include existing roads or public gravel roads in the area that can be used to access the power line).</li> <li>Access roads to be maintained and any erosion gullies to be rehabilitated as part of the maintenance programme on the power lines.</li> <li>Any dead birds found in the power line servitude to be photographed, position recorded and reported to Eskom.</li> </ul>	NEGATIVE LOW	LOW
<b>Socio-Economic Impact</b> 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				
No cumulative impacts were identified during the operational phase.				

Kudu – Elders Route 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	2	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	1	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 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	2	2	3	2	Medium
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
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**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:

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/pylons 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. Fortunately, most of the new power line will be running parallel with and adjacent to existing large, transmission lines, which will help to reduce this potential high risk of collisions, because of improved visibility and already known obstacles in the area to many local birds.

A summary of the sensitivities of the Study Area is as follows:

- The site is within the original extent of veldtype (ecosystem) of Eastern Highveld Grassland, which is a threatened veldtype / ecosystem with a status of ‘Vulnerable’.
- There are no highly sensitive habitats, or no-go zones, present with the proposed power line servitude itself, with the exception of watercourses, in terms of the ecological sensitivity. That is to say that there are few to no pristine habitats present in the study area.
- The southern section of the proposed power line servitude is within demarcated critical biodiversity area (CBA).
- Most of the study area (including the Elders Substation site) is transformed / altered cultivated farming environment. The grassland that is present is moderately to highly degraded.
- The entire proposed Elders Substation location is transformed and has a sensitivity rating of ‘Low’.
- The entire power line route / servitude has a sensitivity rating of ‘Low’, except the watercourses which have a sensitivity rating of ‘High’ and the area of grassland in the south that has a sensitivity rating of ‘Medium’. The ‘high sensitivity’ areas of the watercourses includes the buffer zones. All existing and old cultivated farmlands has a sensitivity rating of ‘Low’.

Route alternative recommendations

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 potential negative impacts arising from the proposed project are low to very low. The footprint of the power line is small, with the biggest negative impacts that on birds regarding power line collisions and electrocutions. Besides birds, the project will have little to no

measurable negative impacts on fauna and very little to no long-term impact on flora. The impacts are lessened by the fact that much of the study area is already within altered and transformed environments. Furthermore, because the site is within the Highveld grasslands no major clearing of trees or shrubs will be required. The power line crosses over a number of small watercourses and the larger Olifants River, but there will be little negative impact on the watercourses themselves. Once again the biggest potential negative impact at watercourse crossings is bird collisions during flight along main watercourses.

There are areas where the two alternative routes deviate from each other, but across these areas there are no significant or meaningful deciding factors. The main difference is in the distance (m) across or near to wetlands and dams. The slight difference of 150m shorter gives the Preferred Route a slightly better rating in terms of risks to birds. However, in reality, the final risks are the same. The 150m difference is in the area just north of the Olifants River, along the property boundaries of the farms Goedehoop and Kleinfontein, where the Preferred Route runs straight across the dams & wetlands, while the Alternative Route deviates east and then north over this section. However, in reality the alternatives will have the same potential impact on birds in this area. Therefore, the risk assessment ratings are the same for the Preferred Route and the Alternative Route in terms of potential negative impacts on avifauna.

The preferred power line route and the alternative power line route both have the same impacts on the natural environment. Either route alternative is expectable in terms of the natural biodiversity and can be used. In summary, taking the ecological, avifauna and heritage sensitivities into account, either route may be constructed. Other factors, such as costs, landowner agreements, etc. can be used to determine the final route alternative. In terms of impact on landowners, the recommended route is **Route 1**.

#### **Proposal for authorisation**

- 1 Kudu – Elders Overhead power line Route 1**
- 2 Elders substation**

## 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 the overhead line as well as for the substation. The Generic EMPr template is available in soft copy and in Appendix F. In addition, refer to Part C: Site Specific Environmental Attributes of the EMPr.

## 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 the following for construction.

- 1 Kudu – Elders Overhead power line Route 1
- 2 Elders substation

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