



**GA Environment**



**DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED ESKOM ALOE  
SUBSTATION AND LOOP-IN LOOP-OUT (LILO) POWERLINES, POLOKWANE  
LOCAL MUNICIPALITY, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO  
PROVINCE**

**March 2021**



**DRAFT BASIC ASSESSMENT REPORT**

**for**

**THE PROPOSED ESKOM ALOE SUBSTATION AND LOOP-IN LOOP-OUT (LILO) POWERLINES,  
POLOKWANE LOCAL MUNICIPALITY, CAPRICORN DISTRICT MUNICIPALITY, LIMPOPO PROVINCE**

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**PROJECT INFORMATION**

<b>Title:</b>	The Proposed Aloe Substation and LILO Powerlines, Polokwane Local Municipality, Capricorn District Municipality, Limpopo Province
<b>Competent Authority:</b>	Department of Environment, Forestry and Fisheries (DEFF)
<b>Applicant:</b>	Eskom Holdings SOC Ltd (LOU)
<b>Environmental Assessment Practitioner:</b>	GA Environment (Pty) Ltd.
<b>Compiled by:</b>	Nyaladzi Nleya
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<b>Date:</b>	March 2021

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**SIGNING OF THE ORIGINAL DOCUMENT**

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## LEGISLATIVE REQUIREMENTS FOR A BASIC ASSESSMENT REPORT

The table below provides the requirements for a Basic Assessment report in terms of the EIA Regulations (Appendix 1) with reference to the relevant sections of this report where these requirements are addressed.

Table 1: Basic Assessment Process

Section	Content	Reference in report
A Basic Assessment Report (BAR) must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include-		
3 (1) (a)	details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.10 <b>Appendix I2</b>
3 (1) (b)	the location of the activity, including: (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 1.2
3 (1) (c)	a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is- (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	Section 1.2 and <b>Appendix A</b>
3 (1) (d)	a description of the scope of the proposed activity, including (i) all listed and specified activities triggered and being applied for; and (ii) a description of the activities to be undertaken including associated structures and infrastructure	Section 1.6
3 (1) (e)	a description of the policy and legislative context within which the development is proposed including- (i) an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report; and (ii) how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments	Chapter 2
3 (1) (f)	a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	Section 1.4
3 (1) (g)	a motivation for the preferred site, activity and technology alternative	Section 1.5

3 (1) (h)	<p>a full description of the process followed to reach the proposed preferred alternative within the site, including:</p> <p>(i) details of all the alternatives considered;</p> <p>(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;</p> <p>(iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;</p> <p>(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(v) the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts-</p> <p style="padding-left: 40px;">(aa) can be reversed;</p> <p style="padding-left: 40px;">(bb) may cause irreplaceable loss of resources; and</p> <p style="padding-left: 40px;">(cc) can be avoided, managed or mitigated.</p> <p>(vi) the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;</p> <p>(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;</p> <p>(viii) the possible mitigation measures that could be applied and level of residual risk; (ix) the outcome of the site selection matrix;</p> <p>(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</p> <p>(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity</p>	Chapter 5
3 (1) (i)	<p>(i) a full description of the process undertaken to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including-</p> <p>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</p> <p>(ii) an assessment of the significance of each issue and risk and an indication of the extent to which the issue and risk could be avoided or addressed by the adoption of mitigation measures</p>	Chapter 7
3 (1) (j)	<p>(j) an assessment of each identified potentially significant impact and risk, including-</p>	Chapter 8

	<p>(i) cumulative impacts;</p> <p>(ii) the nature, significance and consequences of the impact and risk;</p> <p>(iii) the extent and duration of the impact and risk;</p> <p>(iv) the probability of the impact and risk occurring;</p> <p>(v) the degree to which the impact and risk can be reversed;</p> <p>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</p> <p>(vii) the degree to which the impact and risk can be avoided, managed or mitigated</p>	
3 (1) (k)	where applicable, a summary of the findings and impact management measures identified in any specialist report complying with Appendix 6 to these Regulations and an indication as to how these findings and recommendations have been included in the final report	Chapter 8
3 (1) (l)	<p>an environmental impact statement which contains-</p> <p>(i) a summary of the key findings of the environmental impact assessment;</p> <p>(ii) a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers; and</p> <p>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives.</p>	Section 9.1
3 (1) (m)	based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	<b>Appendix H1</b>
3 (1) (n)	any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	Section 9.2
3 (1) (o)	a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed	Section 1.11
3 (1) (p)	a reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	Section 9.2
3 (1) (q)	where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised	Section 9.2
3 (1) (r)	<p>an undertaking under oath or affirmation by the EAP in relation to the correctness of the information provided in the reports;</p> <p>(ii) the inclusion of comments and inputs from stakeholders and I&amp;APs;</p>	<b>Appendix I1</b>

	(iii) the inclusion of inputs and recommendations from the specialist reports where relevant; and  (iv) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.	
3 (1) (s)	where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts	Not Applicable
3 (1) (t)	any specific information that may be required by the competent authority	Not Applicable
3 (1) (u)	any other matters required in terms of section 24(4)(a) and (b) of the Act	Not Applicable

#### **AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)**

I **Nyaladzi Nleya**, an EAP employed by **GA Environment (Pty) Ltd** declare that the information provided in this report is correct and relevant to the activity/ project, that comments from Interested and Affected Parties have been incorporated into this report, that the report has included inputs from Specialists and that all relevant project information was made available to Interested and Affected Parties.



**SIGNATURE OF EAP**

**DATE 03 March 2021**



## EXECUTIVE SUMMARY

### 1 INTRODUCTION

Eskom Holdings (SOC) Limited is mandated by the South African Government to ensure the provision of reliable and affordable power to South Africa. Eskom currently generates approximately 95% of the electricity used in South Africa. Therefore, electricity must be generated in accordance with supply demand requirements. Eskom's core business is in the generation, transmission, distribution (transport), trading and retail of electricity. There is a growing demand of electricity in the Polokwane local municipality, accelerated by the electrification load as well as the new residential developments in the area.

Given the above observation, GA Environment (Pty) Ltd has been appointed by Eskom Limpopo Operating Unit (LOU) to undertake a Basic Assessment (BA) and Water Use Authorisation (WUA) for the proposed construction of a 132kV substation and associated and parallel 132kV Silica-Aloe loop-in and Thabamoopo-Aloe loop-out powerlines. The objective of the proposed project is to secure supply of electricity in order to cater for proposed developments in the area.

The proposed substation will cover an extent of 2 hectares and will include the construction of a 6m wide and 200m long access road. Eskom has proposed an alternative area for the location of the substation that will also cover an extent of 2 hectares. The preferred and alternative sites for the substation are located about 200m adjacent from each other. Associated infrastructure that will support the new Aloe substation, will include, a communication tower, a 132/22kV transformer, a 132/11kV transformer, 2x 22kV feeder bays and 3x 11kV feeder bays". For the purpose of this Basic Assessment, a 1 km corridor has been proposed as a study area that will include the associated powerlines (Silica-Aloe loop in powerline and Thabamoopo loop out powerline). The 1km corridor is part of the development footprint area, surrounding the proposed infrastructure and was assessed in this Basic Assessment process.

The project area is located approximately 12km to the east of Polokwane and west of the Nobody and Thakgalang residential areas. The residential area of Orange grove along with the existing Aloe Substation is located east of the site. The proposed infrastructure is located immediately south of the R71 roadway, with the 1km corridor extending to the South of this road. The project area is located on historical farmland in a region characterised by existing powerlines, sand mining and subsistence farming activities. The study area is also surrounded by vacant land and light Industrial activities. Prominent natural features in the vicinity of project area include various rock outcrops located on

koppies to the east and west of the site and the Diep River, (a tributary of the Sand River) that transects the project area approximately 800m east of the proposed project infrastructure.

The creation of an access road and a construction camp will form part of the proposed project activities. The access road will enable transportation of material, construction teams to the site and will be used for maintenance purposes during the operational phase of the project. The construction camp will be established at a strategic position to provide optimum access and limit disturbance to greenfield areas. The construction of the distribution line will involve teams working in phases whereby a number of activities such as surveying, bush-clearing, fencing, foundation-laying, tower erection and stringing of the powerline.

## **2 LEGISLATIVE FRAMEWORKS**

All legal provisions and the legal context for the proposed development presented in this document include a review of legislation, regulations, policies and guidelines, which are relevant to, or have implications, for the proposed project. The National Environmental Management Act, Act No. 107 of 1998 has, in terms of sections 24(2) and 24D of the Act, established Regulations to govern the undertaking of the EIA processes. The Regulations, amended in 2017, refer to listed activities that require either a Basic Assessment process or a Scoping and Environmental Impact Assessment process to be undertaken before such activities can be authorized.

The Act requires that in such cases the impacts must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity. The NEMA EIA Regulations guide the processes required for the assessment of impacts of Listed Activities.

According to the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 as amended, a Basic Assessment process is required for the proposed Eskom Aloe development as it triggers several listed activities. A 'listed activity' refers to any activity that is presented under any of the three Listing Notices that have been published under Government Gazette No 40772 on 07 April 2017 and are an amendment of the 2014 Regulations that were published under Government Gazette No. 38282 on 04 December 2014.

The public participation for the project has been conducted as per the requirements of the General Provisions of Annexure 2 of the Regulations issued in terms of Section 27(2) of the Disaster Management Act, 2002 (Act No.57 of 2002) and published on 29 April 2020 in Government Notice No R.480 of Government Gazette No 43258 and also in terms of the directions regarding the measures to

address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences issued by the Minister of Environment, Forestry and Fisheries on 05 June 2020.

### 3 BASIC ASSESSMENT PROCESS

Project activities as provided were used to determine the activities that will trigger listed activities in terms of NEMA EIA Regulations (2014), as amended. According to these regulations, a Basic Assessment Process is required for the proposed development as it triggers the following activities under GNR 983 Listing Notice 1 and GNR 985 Listing Notice 3:

- *Listing Notice 1: Activity 11*, The development of facilities or infrastructure for the transmission and distribution of electricity (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.
- *Listing Notice 1: Activity 27*, The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.
- *Listing Notice 3: Activity 3*, The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower (a) is to be placed on a site not previously used for this purpose; and (b) will exceed 15 metres in height e. Limpopo, Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.
- *Listing Notice 3: Activity 12*, The clearance of an area of 300 square metres or more of indigenous vegetation, e. Limpopo, (ii) Within critical biodiversity areas identified in bioregional plans.

The above listed activities are triggered by the proposed development of a new substation and loop in and loop out power lines to connect to the existing Silica-North 132kV line. It must also be noted that indigenous vegetation must be cleared (i.e. permanent removal) in a Critical Biodiversity Area to accommodate the construction of a 2-hectare (20 000m<sup>2</sup>) substation. *Indigenous vegetation* refers to plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years that occurs on site.

Due to the triggered activities, it is necessary to obtain an Environmental Authorisation for the above-mentioned listed activities. In terms of Section 24(1) of NEMA, the potential impact on the environment associated with the listed activities must be considered, investigated, assessed and

reported to the Department of Environment, Forestry and Fisheries (DEFF) as the Competent Authority (CA).

The proposed development is classified as a Strategic Infrastructure Projects (SIPs) as described in the National Development Plan (2011). SIP 10 looks to unlock electricity transmission and distribution for all and expand the transmission and distribution network to address historical imbalances, provide access to electricity for all and support economic development.

#### **4 DESCRIPTION OF THE AFFECTED ENVIRONMENT**

An understanding of the overall character and other sensitivities that were identified in the surrounding environment is pertinent to the project. Both the biophysical aspects and the socio-economic conditions of the site are described in this report. The biophysical aspects discussed are climate, vegetation, flora, fauna, avifauna, hydrology and geology. With regards to the socio-economic conditions, the population structure, economic development and basic service delivery in the study area are discussed.

The biophysical aspects of the site as indicated by the specialist studies outline the following information about the site and its surroundings:

- The prevailing land cover consists primarily of open natural land and rural settlement. The land use is primarily livestock grazing, subsistence farming and homeland dwellings;
- The project area is located within a CBA1 and 2 area, and within areas indicated to comprise remnant Polokwane Plateau Bushveld and Mamabolo Mountain Bushveld vegetation;
- The project area does not overlap with any class 1 FEPA Rivers or wetlands, however it does overlap the Diep River which is classified as a class 4 Upstream Management Area;
- Protected tree species in terms of the National Forest Act (Act No. 84 of 1998), namely *Sclerocarya birrea* subsp. *caffra* were recorded in the study area; and
- An informal cemetery and a modern abandoned farmhouse were identified in the study area.

#### **5 ALTERNATIVES**

In terms of Section 24 of NEMA, the proponent is required to demonstrate that alternatives have been investigated and described in sufficient detail during the BA process. It is important to highlight that alternatives must be practical, feasible, reasonable and viable to cater for an unbiased approach to the project and in turn to ensure environmental protection. A total of four (4) alternatives types were assessed for the project, namely site location alternatives, design alternative, routing alternatives and

layout alternatives in addition to the no-go alternative. The advantages and disadvantages of each of these alternatives as well as the reason for the preferred alternative are presented in this report.

## 6 PUBLIC PARTICIPATION PROCESS

On the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to NEMA Permits and Licenses. The Draft BAR has been submitted as per these Directions which provide the process to be followed in undertaking public participation while ensuring that the EAPs actions curtail the threat posed by the Covid-19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster.

One of the requirements provided in the above referenced directions is that a Public Participation Plan shall be submitted to the DEFF, in instances where a case officer has been assigned to the project then the Public Participation Plan shall be submitted to the case officer. A Public Participation Plan was submitted to the DEFF on the 21<sup>st</sup> of July 2020. The DEFF approved the plan on the 30<sup>th</sup> of July 2020 and the Public Participation Plan is attached to **Appendix E1**.

The potential Interested and Affected Parties (I&APs) were identified and notified of the project through notification letters and a local newspaper advert inviting them to register on the project database in order to be kept abreast of all developments related to the project. The registration was open to the public from 17 August 2020 until 16 September 2020 although allowance for stakeholder registration will remain open throughout the BA process.

The draft BAR will be made available for comments to the various I&APs and the Competent Authority for a period of 30 days. All the issues and comments received during the comment period will be documented and responded to in the Comments and Response Report (CRR). These comments will also be incorporated into the final BAR and submitted to the Competent Authority for decision-making on the application. Registered I&APs will be notified of the decision once issued.

## 7 ENVIRONMENTAL IMPACTS

This DBAR has provided a comprehensive assessment of the potential environmental impacts associated with the proposed development. These impacts have been identified by the EAP and the specialist studies and the key findings of the BA process are discussed in this report.

In accordance with Government Notice R. 982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), the EAP is required to assess the significance of potential impacts in terms of the following criteria:

- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Reversibility of impacts;
- Impact on irreplaceable resources; and
- Cumulative impacts.

The potential impacts identified and discussed were divided into two themes which are as follows.

- *Theme 1: Impacts on the Biophysical Environment* - (impacts on surrounding indigenous plant species, fauna, soil and surface and water); and
- *Theme 2: Impacts on the Human Environment*- (impacts on surrounding infrastructure, and services, informal graves, visual impacts, dust and air quality, noise, heritage, health and safety).

Cumulative impacts were also discussed in this report and the table below indicates a summary of impacts identified.

Table 2: Impact Assessment Summary Table

Impact description	Type of impact	Project phase	Significance without mitigation	Significance with mitigation
IMPACT 1: Impacts on loss of Floral Species of Conservation Concern	NEGATIVE (- VE)	Construction	High	Medium Low
		Operational	Medium	Low
IMPACT 2: Impacts on loss of Faunal species	NEGATIVE (- VE)	Construction	Medium	Medium Low
		Operational	Medium	Low
IMPACT 3: Impacts on Floral and Faunal habitat	NEGATIVE (- VE)	Construction	Medium	Medium Low
		Operational	Medium Low	Low

<b>IMPACT 4: Impacts on Floral Species Diversity</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium	Medium Low
		Operational	Medium Low	Low
<b>IMPACT 5: Impacts on avifaunal species due to displacement of habitats and foraging areas</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Low	Low
<b>IMPACT 6: Impacts on mortality of avifaunal species due to collision with the power lines</b>	<b>NEGATIVE (- VE)</b>	Construction	Low	Low
		Operational	Medium	Low
<b>IMPACT 7: Impacts on surface water</b>	<b>NEGATIVE (- VE)</b>	Construction	Low	Low
		Operational	Low	Low
<b>IMPACT 8: Impacts related to soil disturbance and sedimentation</b>	<b>NEGATIVE (- VE)</b>	Construction	Low	Low
		Operational	Low	Low
<b>IMPACT 9: Impacts on Heritage and Paleontological Resources</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Medium Low	Low
<b>IMPACT 10: Impact on air quality</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Low	Low
<b>IMPACT 11: Impact on Agricultural practices</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Low	Low
<b>IMPACT 12: Impacts on access roads</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium	Low
		Operational	Low	Low
<b>IMPACT 13: Impacts on traffic on local roads</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Low	Low
<b>IMPACT 14: Visual Impacts</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Low	Low
<b>IMPACT 15: Impact on noise generated</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Medium	Low
<b>IMPACT 16: Impact on Health and Safety</b>	<b>NEGATIVE (- VE)</b>	Construction	Medium Low	Low
		Operational	Medium Low	Low
<b>IMPACT 17: Social Impacts</b>	<b>NEGATIVE (+ VE)</b>	Construction	Positive	Positive
		Operational	Positive	Positive

## 8 CONCLUSIONS AND RECOMMENDATIONS

The key findings of the BA Process are discussed in this report. It is the recommendation of the EAP that the design (**Layout Option 1**) be approved as it details the most effective way of meeting the need and purpose of the proposed activity whilst minimising its impact on the environment. The impact assessment has revealed that the construction and operational phases of the proposed project will generate impacts of low to very low significance after mitigation and result in positive socio-economic impact.

Taking into consideration the findings of the environmental impact assessment, the project benefits outweighs the negative impacts identified provided that mitigation measures are applied effectively. Impacts of high significance are not foreseen once proper mitigation measures have been implemented. The EAP's key recommendations outlined in the report are as follows:

- a. Once the powerline alignment and positioning of poles have been finalised, a final walkthrough of the alignment must be undertaken by a suitably qualified ecologist in order to confirm the presence or absence of floral SCC, protected species and TOPS-listed species;
- b. The applicant must apply for a permit from DEFF to cut, disturb or remove number of protected tree species (*S. birrea subsp. caffra*) affected must be determined as part of the DEFF permit application to cut, disturb, damage or destroy these trees;
- c. The applicant must apply for a Water use Licence from the Department of Water Affairs in areas where water resources are impacted (streams and wetland crossing) before commencement of construction in those areas;
- d. The Diep River should be regarded as "No-Go" areas for the proposed power lines and substations, access tracks and related activities. The 1: 100 year floodline and a 100m line from the centre of the spruit, whichever is the greatest will be regarded as "No-Go" areas. Should the applicant decide to place any structure within the wetland areas or its buffer zone or within the flood lines, such activities must be undertaken as per the requirements of the Water Use License;
- e. A walk-down of the power line route must be undertaken by a Heritage Resource Specialist prior to commencement of the construction phase to ensure avoidance of recorded heritage features;
- f. The maintenance corridor must not involve complete clearance or removal of vegetation,



- but rather be limited to cutting and trimming of vegetation only where necessary;
- g. The location of construction camps should be carefully considered, and sensitive areas be avoided.
  - h. The Contractor shall inform all adjacent landowners of the commencement of construction activities at least 30 days before the commencement via adequate signage at strategic points on site;
  - i. An Independent Environmental Control Officer must be appointed to monitor all construction activities and ensure the demarcation of all applicable areas;
  - j. Adhere to all recommendations outlined in the specialist Reports (**Appendix F**), and the Environmental Management Programme in **Appendix H1**,

## DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED ESKOM ALOE SUBSTATION AND LOOP-IN LOOP-OUT (LILO) POWERLINES

### TABLE OF CONTENTS

<b>LEGISLATIVE REQUIREMENTS FOR A BASIC ASSESSMENT REPORT .....</b>	<b>1</b>
<b>1 INTRODUCTION .....</b>	<b>24</b>
1.1 Background .....	24
1.2 Project Location .....	24
1.3 Route selection and Description .....	27
1.3.1 Silica Aloe Loop-in (green) and Thabamooopo Loop out (red) Proposed Route .....	27
1.3.2 Silica Aloe Loop-in (orange) and Thabamooopo Loop out (red) Alternative Route 1 .....	27
1.4 Proposed substations.....	27
1.4.1 Proposed Aloe Substation (purple).....	27
1.4.2 Aloe Substation (yellow) .....	28
1.5 Status Quo of the site and Surrounding Land Uses .....	28
1.6 Project Motivation .....	30
1.7 Infrastructure Description.....	32
1.8 Servitude Requirements .....	33
1.9 Line Clearances .....	34
1.10 Required Services.....	35
1.8.1 Access Road.....	35
1.8.2 Construction Site Camps .....	35
1.8.3 Sewage .....	35
1.8.4 Solid Waste Disposal .....	36
1.8.5 Electricity.....	36
1.8.6 Applicable NEMA Listed Activities .....	36
1.8.6 Objectives of the Basic Assessment Process.....	38
1.11 Structure of the Basic Assessment Report.....	38
1.12 Project Team .....	39
1.13 Specialist Studies.....	40
1.14 Assumptions, Gaps and Limitations .....	41
<b>2 LEGISLATIVE FRAMEWORK .....</b>	<b>42</b>
2.1 National Legislation.....	42
2.1.1 Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996).....	42
2.1.2 National Environmental Management Act, 1998 (Act No. 107 of 1998).....	42
2.1.3 National Environmental Management: Biodiversity Act (10 of 2004): National Threatened or Protected Species Regulations and Species Lists, 2015.....	46

2.1.4	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	48
2.1.5	National Forests Act, 1998 (Act No. 84 of 1998)	49
2.1.6	Conservation of Agricultural Resources Act (CARA; Act No. 43 of 1983)	50
2.1.7	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	50
2.1.8	Electricity Regulation Act, 2006 (Act No. 4 of 2006)	51
2.1.9	Electronic Communications Act 36 of 2005	52
2.1.10	Carbon Tax Act No 15 of 2019	52
2.1.11	Other National Legislation concerning or related to the environment	53
2.2	Provincial Legislation	53
2.2.1	The Limpopo Environmental Management Act, 2003 (ACT 7 OF 2003) LEMA	53
2.2.2	Limpopo Conservation Plan (Version 2)	54
<b>3</b>	<b>BASIC ASSESSMENT METHODOLOGY</b>	<b>55</b>
3.1	Pre- Consultation with the Competent Authority	55
3.2	Registration of the Application with the Competent Authorities	55
3.3	Public Participation Process	55
3.4	Draft Basic Assessment report	56
3.5	Requirement to submit a report generated by the national web-based environmental screening tool	56
3.5.1	Proposed Development Area Environmental Sensitivity	57
3.5.2	Specialist Assessments Identified	57
3.6	Other Supporting Documents to the Basic Assessment	60
3.7	Issuing of Environmental Authorisation	60
3.8	Appeal Period	60
<b>4</b>	<b>DESCRIPTION OF THE AFFECTED ENVIRONMENT</b>	<b>62</b>
4.1	Biophysical environment	63
4.1.1	Climate	63
4.1.2	Geology	64
4.1.3	Protected Areas	64
4.1.4	Vegetation	65
4.1.5	Avifauna	68
4.1.6	Wetland and Hydrological conditions	71
4.1.7	Land Cover	73
4.1.8	Urban Edge	73
4.2	Human Environment	73
4.2.1	Socio-economic conditions	73
4.2.2	Heritage and Palaeontological conditions	75
4.2.3	Visual and Aesthetics conditions	76
<b>5</b>	<b>ALTERNATIVES</b>	<b>77</b>

5.1	Site Location Alternatives .....	79
5.1.1	Aloe Substation (Purple, Preferred option) .....	79
5.1.1	Aloe Substation (Yellow, alternative option) .....	80
5.2	Design Alternatives .....	82
5.2.1	Proposed Steel Monopole Structure vs Lattice structures .....	82
5.3	Routing Alternatives .....	85
5.4	Site Layout Alternatives .....	85
5.5	No go Alternative .....	88
<b>6</b>	<b>PUBLIC PARTICIPATION PROCESS.....</b>	<b>90</b>
6.1	Stakeholder Pre-Consultation .....	90
6.2	Identification of Interested and Affected Parties .....	91
6.3	Notification Letters .....	91
6.4	Newspaper Advertisement .....	92
6.5	Notice Boards/Site Notices .....	92
6.6	Availability of Draft Basic Assessment Report for review .....	92
6.7	I&AP's Register and Comments & Response Report .....	92
6.8	Focus Group Meetings .....	93
<b>7</b>	<b>IMPACT ASSESSMENT METHODOLOGY .....</b>	<b>94</b>
7.1	Impact Mitigation Hierarchy .....	94
7.2	Impact Assessment Methodology.....	95
<b>8</b>	<b>DESCRIPTION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS.....</b>	<b>102</b>
8.1	Theme 1: Impacts on the Biophysical Environment .....	103
8.1.1	Impacts on loss of floral species of Conservation Concern and habitats .....	103
8.1.2	Impacts on loss of Faunal Species.....	105
8.1.3	Impacts on Faunal communities .....	106
8.1.4	Impacts on displacements of avifaunal species as a result of habitat loss or transformation .....	108
8.1.5	Impacts on displacement of avifaunal species as a result of disturbance.....	109
8.1.6	Impacts on direct mortality as a result of construction activities .....	111
8.1.7	Impacts on mortality due to collision with earth wire of the powerlines .....	112
8.1.8	Impacts on mortality of red list species due to electrocution .....	113
8.1.9	Impacts of birds on the quality of electrical supply .....	114
8.1.10	Impacts on disturbance and degradation of vegetation.....	115
8.1.11	Impacts on increased bare surfaces, runoff and potential for erosion .....	117
8.1.12	Impacts on contaminations of wetlands due to hydrocarbons and spillages .....	118
8.1.13	Impacts on waste generated.....	119
8.2	Theme 2: Impacts on the Socio-Economic Environment.....	120
8.2.1	Social Impacts .....	120

8.2.2	Impacts on Agricultural practices .....	122
8.2.3	Impacts on dust and air quality.....	123
8.2.4	Impacts on noise generated.....	123
8.2.5	Impacts on traffic on local roads.....	124
8.2.6	Impact on Access Roads.....	125
8.2.7	Impacts on Health and Safety .....	126
8.2.8	Impacts on Heritage and Palaeontology .....	127
8.2.9	Visual Impacts .....	128
8.3	Cumulative Impacts .....	128
<b>9</b>	<b>CONCLUSION, ENVIRONMENTAL IMPACT STATEMENT AND RECOMMENDATIONS .....</b>	<b>130</b>
9.1	Environmental Impact Statement.....	130
9.2	EAP's Recommendations .....	132
<b>10</b>	<b>BIBLIOGRAPHY .....</b>	<b>135</b>

### LIST OF FIGURES

Figure 1:	Locality map of the project area.....	25
Figure 2:	Illustration of the design of the communication tower.....	26
Figure 3:	A – Bushveld Vegetation in the area, B – Acacia hebeclada plant species, C – Dumped waste on the site, D – Animal faeces to indicate the presence of farming on the surrounding areas.....	29
Figure 4:	A kraal observed on site with livestock .....	30
Figure 5:	A ridge with an existing telecommunication mast, observed from the southern direction of the proposed site .....	30
Figure 6:	Second ridge observed from the northern direction of the proposed site and powerlines.....	30
Figure 7:	Third ridge observed from the south-eastern direction of the proposed site and powerlines.....	30
Figure 8:	Example of a steel monopole structure noted on site .....	32
Figure 9:	Stayed Angle Strain Structure Design .....	33
Figure 10:	A – Animals grazing on site, B – Thornveld trees, C – A dry stream observed on site, D – Animal carcass observed close to the alternative area.....	63
Figure 11:	Monthly average rainfall and temperature for Polokwane (Source: <a href="https://en.climate-data.org">https://en.climate-data.org</a> ) ....	63
Figure 12:	The location of the project area in relation to protected and conservation areas (Field and Form Landscape Science, 2020) .....	65
Figure 13:	A – Bushveld habitat unit in the south, B – Modified Bushveld unit in the north, C – Granite Outcrop in the north and D – Riparian habitat unit in the east (Field and Form Landscape Science: 2020).....	66
Figure 14:	Vegetation types associated with the project area (Field and Form Landscape Science, 2020).....	67
Figure 15:	Regional map detailing the location of the proposed in relation to Important Bird Areas (IBAs) and Coordinated Waterbird Count (CWAC) sites (Source: Feathers Environmental Services, 2020).....	69
Figure 16:	National Wetland Map (The Biodiversity Company, 2020) .....	72
Figure 17:	Graves observed on site .....	75
Figure 18:	Representative photographs of habitat conditions within the Aloe Substation Alternative 1 and 2 development footprint areas.....	81
Figure 19:	Layout Alternative 1 (Preferred).....	86
Figure 20:	Layout Alternative 2 .....	87
Figure 21:	Layout Alternative 3 .....	87
Figure 22:	Layout Alternative 4 .....	88
Figure 23:	Mitigation hierarchy showing levels of preference (Eco Intelligent, 2016).....	94

## LIST OF TABLES

Table 1: Basic Assessment Process .....	1
Table 2: Impact Assessment Summary Table .....	10
Table 3: Glossary of terms .....	21
Table 4: Minimum standards to be used for vegetation clearing for the construction of a new line .....	34
Table 5: Key Listed Triggered Activities .....	36
Table 6: Applicants Details.....	39
Table 7: Specialist studies and contact details .....	40
Table 8: Summary of the South African EIA regulations from inception to date .....	44
Table 9: Environmental Sensitivity of Project Area (DEFF Screening Tool) .....	57
Table 10: Specialists Assessments Identified.....	57
Table 11: : Annotated list of the Red List species recorded in the relevant pentads surrounding the proposed Aloe Substation and Silica-Aloe and Thabamoo-po-Aloe 132kV Loop-In and Loop-Out power line development area.....	70
Table 12: Population size and growth rate in Polokwane Municipality (Source: Global Insight, 2013) .....	74
Table 13: Alternative types.....	78
Table 14: Brief comparative assessment of the project alternatives .....	81
Table 15: Project phases in a development.....	97
Table 16: Assessment Criteria .....	98
<i>Table 17: Assessment of impacts related to the loss of Floral Species of Conservation concern.....</i>	<i>104</i>
Table 18: Assessment of impacts related to the loss of Faunal Species.....	106
Table 19: Assessment of impacts related to the loss of Floral and Faunal Habitats .....	107
Table 20: Assessment of Impacts on displacement of avifaunal species as a result of habitat loss and transformation.....	109
Table 21: Impacts on displacement as a result of disturbance on avifaunal species .....	110
Table 22: Assessment of the impacts as a result of direct mortality of avifaunal species .....	111
Table 23: Assessment of the impacts as a result of collision with the earth wire of the proposed 132kV Loop-In and Loop-Out power lines .....	112
Table 24: Assessment of the impacts as a result of mortality of Red List species due to electrocution on the power line towers and within the substation.....	114
Table 25: Assessment of impacts as a result of birds on the quality of electrical supply.....	115
Table 26: Assessment for the impacts on the disturbance and degradation of wetland vegetation.....	116
Table 27: Assessment for the impacts on increased bare surfaces, runoff and potential for erosion.....	117
Table 28: Assessment of impacts on contaminated wetlands due to hydrocarbons and spillages .....	118
Table 29: Assessment of impacts related to waste generation.....	119
Table 30: Assessment of impacts on influx of workers .....	120
Table 31: Assessment of impacts on safety and security .....	121
Table 32: Assessment of impacts on agricultural practices.....	122
Table 33: Assessment of impacts on dust and air quality.....	123
Table 34: Assessment of impacts on noise generated .....	124
Table 35: Impacts on Assessment of traffic on local roads .....	124
Table 36: Assessment of Impacts on Access Roads.....	125
Table 37: Assessment of impacts on Health and Safety.....	126
Table 38: Assessment of impacts on heritage resources.....	127
Table 22: Assessment of visual impacts .....	128

## LIST OF APPENDICES

**Appendix A:** Maps

**Appendix B:** Facility Illustrations

Appendix B1: Steel Monopole Designs

Appendix B2: General Layout for Substation

Appendix B3: Communication Tower Designs

**Appendix C:** Site Photographs

**Appendix D:** Correspondence with the Competent Authority

Appendix D1: Signed Application Form

Appendix D2: SIP Project Confirmation

**Appendix E:** Public Participation Process

Appendix E1: Public Participation Plan and Approval

Appendix E2: Newspaper Advert

Appendix E3: Notification Letter

Appendix E4: Site Notice and proof of placement

Appendix E5: Proof of Consultation with I&APs

Appendix E6: Interested and Affected Parties Register

Appendix E7: Comments and Responses Report

**Appendix F:** Specialist Assessments

App F1 - Avifauna Impact Assessment

App F2 - Wetland Impact Assessment

App F3 - Terrestrial Biodiversity Assessment

App F4 - Geotechnical Investigation

App F5 - Heritage and Palaeontology Impact Assessment

App F6 – Civil Aviation Statement

**Appendix G: Specialist Declarations and CVs**

**Appendix H:** Management Plans

App H1 – Environmental Management Plan

App H2 – Alien Invasive Management Plan

App H3 – Erosion and Soil Management Plan

**Appendix I:** Details of Environmental Assessment Practitioner

App I1 - EAP Declaration of Interest

App I2 - Curriculum Vitae of Environmental Assessment Practitioner

**Appendix J:** Department of Environment, Forestry and Fisheries: Screening Tool Report

## LIST OF ABBREVIATIONS / ACRONYMS

BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
CBA	Critical Biodiversity Area
DBAR	Draft Basic Assessment Report
DEFF	Department of Environment, Forestry and Fisheries
DWA	Department of Water and Sanitation
EAP	Environmental Impact Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Areas
GHG	Green House Gas
IDC	Industrial Development Corporation of South Africa Limited
I&APs	Interested and Affected Parties
kV	Kilovolt amperes
LEMA	Limpopo Environment Management Act (No. 7 of 2003)
LILO	Loop-In Loop-Out
LOU	Limpopo Operating Unit
MW	Megawatt
NERSA	The National Energy Regulator of South Africa
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998),
NEMA	National Environmental Management Act (Act 107 of 1998)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
RI&APs	Registered Interested and Affected Parties
SANBI	South African National Biodiversity Institute
PPP	Public Participation Process



## GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report and, or other documents drafted for the project.

*Table 3: Glossary of terms*

Term	Definition	Reference
<b>Clearing/Clearance</b>	Clearing/Clearance refers to the removal of vegetation through permanent eradication and in turn no likelihood of regrowth. 'Burning of vegetation (e.g. fire- breaks), mowing grass or pruning does not constitute vegetation clearance, unless such burning, mowing or pruning would result in the vegetation being permanently eliminated, removed or eradicated'.	Department of Environmental Affairs, 2017. Clearance of Indigenous Vegetation Explanatory Document
<b>Competent Authority</b>	In respect of a listed activity or specified activity, means the organ of state charged by this Act with evaluating the environmental impact of that activity and, where appropriate, with granting or refusing an environmental authorisation in respect of that activity.	National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended, NEMA 1998 hereafter
<b>Critical Biodiversity Area</b>	Areas that are deemed important to conserve ecosystems and species. For this reason, these areas require protection.	South African National Biodiversity Institute (SANBI)
<b>Duty of Care</b>	Every person who causes, has caused or may cause significant pollution or degradation of the environment to take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environmental is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution and degradation of the environment. "	NEMA, 1998
<b>Decommissioning</b>	means to take out of active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily recommissioned;	NEMA, EIA Regulations, 2014, as amended
<b>Environment</b>	the surroundings within which humans exist and that are made up of— (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life;	National Environmental Management Act 1998 (Act No. 107 of 1998), as

Term	Definition	Reference
	(iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.	<i>amended</i> , NEMA hereafter
<b>Environmental Assessment Practitioners</b>	The individual responsible for the planning, management, coordination or review of environmental impact assessments, strategic environmental assessments, environmental management programmers or any other appropriate environmental instruments introduced through regulations.	NEMA, 1998
<b>Indigenous vegetation</b>	Refers to vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years.	NEMA, EIA Regulations, 2014, as amended
<b>Interested and Affected Parties (IAPs)</b>	a) any person, group of persons or organisation interested in or affected by such operation or activity; and (b) any organ of state that may have jurisdiction over any aspect of the operation or activity.	NEMA, 1998
<b>Phased Activity</b>	Means an activity that is developed in phases over time on the same or adjacent properties to create a single or linked entity, but excludes any activity for which an environmental authorisation has been obtained in terms of the Act or the Environment Conservation Act, 1989 (Act No. 73 of 1989);	NEMA, EIA Regulations, 2014, as amended
<b>Protected Area</b>	A protected area is a clearly defined geographical space, recognised, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.	International Union for Conservation of Nature (IUCN)
	These are areas aimed at the protection and conservation of areas which are ecologically viable and have high biodiversity. Example of Protected Areas include but are not limited to National Parks, Nature Reserves, world heritage sites and marine protected areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)  <b>19.2.1</b>
<b>Public Participation Process</b>	In relation to the assessment of the environmental impact of any application for an environmental authorisation, means a process by which potential Interested and Affected Parties are given opportunity to comment on, or raise issues relevant to, the application.	NEMA, 1998, as amended

Term	Definition	Reference
<b>Species Conservation Concern</b>	<b>of</b> IUCN Red List definition: Threatened species, and other species of significant conservation importance: Extinct, Extinct in the Wild, Near Threatened, Data Deficient. In South Africa, the following additional categories are added: Rare, Critically Rare.	SANBI

## 1 INTRODUCTION

### 1.1 Background

GA Environment (Pty) Ltd has been appointed by Eskom Limpopo Operating Unit (LOU) to undertake a Basic Assessment (BA) and Water Use Authorisation (WUA) Process for the proposed construction of the Aloe substation and LILO Powerlines. The proposed substation will cover an extent of 2 hectares with a capacity of 132kV. The powerlines consist of a Silica loop-in powerline and Thabamopo-Aloe loop-out powerline. The length of the powerline will be about 2,2km. The intention of the proposed development is to secure supply of electricity in order to cater for proposed new developments in the area.

In terms of the Environmental Impact Assessment (EIA) Regulations 2014, as amended and read with Section 24 (5) of the National Environmental Management Act (Act No 107 of 1998), the proposed development is subject to a Basic Assessment process. The required Basic Assessment (BA) will be undertaken in order to investigate and assess any potential environmental impacts associated with the development prior to implementation. This draft BA Report will also focus in depth on issues which were identified during the field assessment. It consists of heritage, avifaunal, geotechnical ecological specialist investigations, detailed desktop research, as well as an impact assessment based on identified environmental aspects.

### 1.2 Project Location

The proposed development is located on the farm Majebaskraal 1005 LS, about 18km east of the Polokwane CBD along the R71 to Tzaneen within the Polokwane Local Municipality. The proposed activity consists of a New Electrical Substation at coordinates S23° 53.975' E29° 37.363', with an alternative site at coordinates S23° 54.087' E29° 37.396'. From the substation, an overhead 132kv power line will extend southwards for approximately 2.2km where it links up with an existing overhead power line. Please refer to **Figure 1**, for a site locality map of the proposed substation and 1km corridor of the loop in and loop out powerlines.

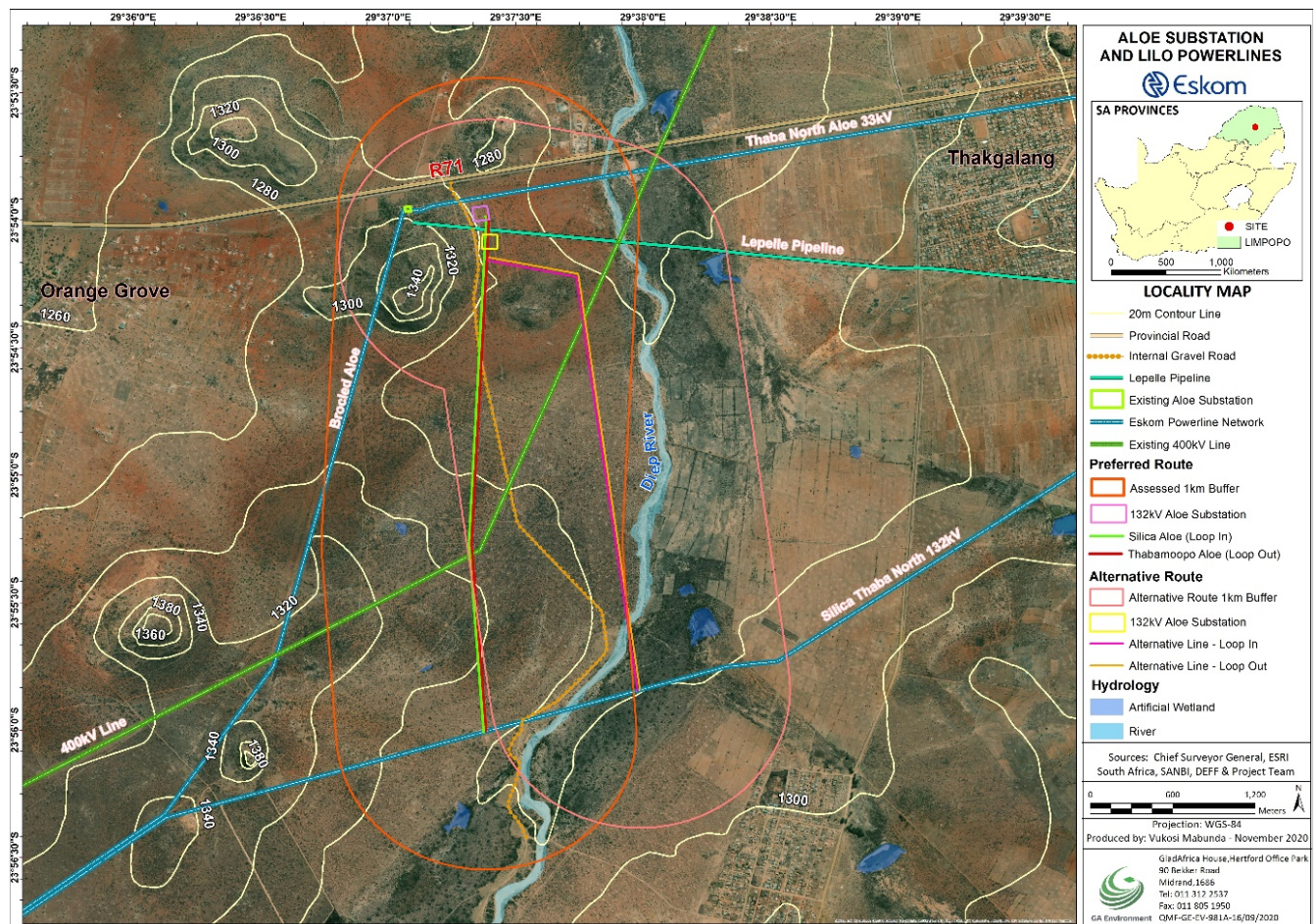


Figure 1: Locality map of the project area

The proposed substation and powerline routes fall within the Farm Majebaskraal 1005, with the following SGID TOLS0000000100500000. The 1km buffer from the powerline routes extends by a few meters into the neighbouring Farm Kalkfontein 1001, with the following SGID TOLS00000000100500000. It must be noted that the farms consist of sub-portions and the following SGIDs are applicable to the sub portions of the farms respectively:

- TOLS00000000100500001
- TOLS00000000100100002
- TOLS00000000100100229

The proposed development will comprise of the following key infrastructure:

- 100m x 100m (2 Hectares) 132 kV Substation with access road;
- 132kV Aloe Thabamoopo loop-out line of  $\pm 2.2$  km in length;
- 132kV Silica Aloe loop-in line of  $\pm 2.2$  km in length;
- 132/22kV 1x40MVA transformer and 132/11kV 1x40MVA transformer;
- 2 x 22kV feeder bays, 3 x 11kV feeder bays; and
- A communication tower.

The microwave communication tower of a height of up to 65 meters will be built within the substation boundary. Microwave communication is the use of electromagnetic waves with wavelengths of between 0.1mm to 1m microwave communication. The wavelength range corresponds to a frequency range of 300 MHz to 300 GHz. Different from modern communication methods such as coaxial cable and optical cable, microwave communication is a means of information exchange performed by microwave as a communication medium. Microwave communication can be established as long as there are no obstacles between the two points. This tower will form part of the supporting infrastructure of the proposed developments. Please refer to **Figure 2** for the designs of the communication tower.

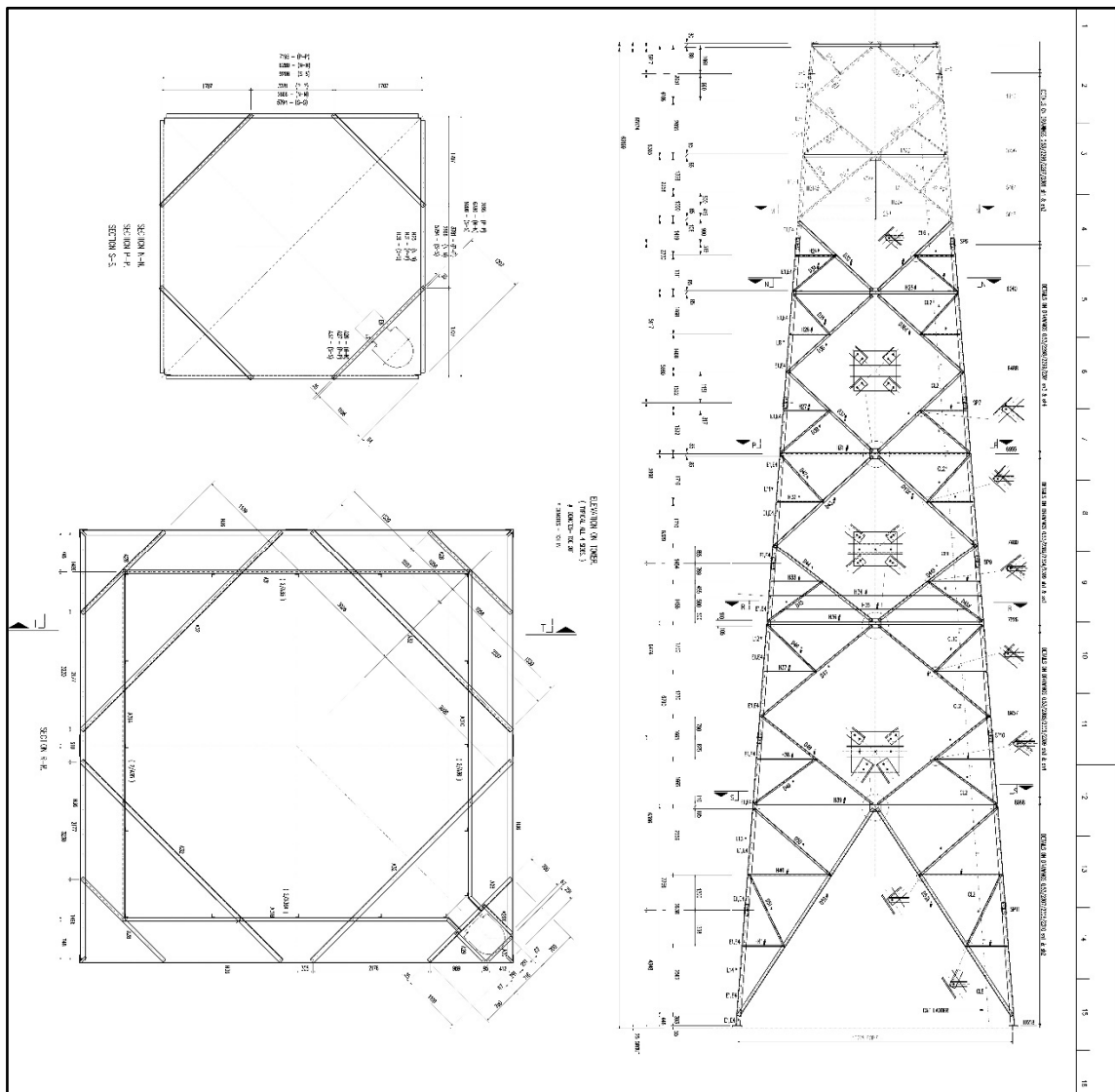


Figure 2: Illustration of the design of the communication tower

### 1.3 Route selection and Description

The preferred routing options indicated below was identified during extensive site and routing investigations undertaken by Eskom representatives and the EAP Team. Topography, hydrology, land ownership and servitude negotiation, line maintenance, line constructability, access, economic, social and environmental aspects were considered during the viability assessment of the route. Based on this assessment the preferred option was identified as the most viable routing option. Therefore, two routes with the associated alternatives are proposed as indicated in **Figure 1**.

#### 1.3.1 Silica Aloe Loop-in (green) and Thabamopo Loop out (red) Proposed Route

This loop in and loop out line is proposed to connect the new substation to the existing Silica Thaba North 132kV powerline. The route aligns south for 2.2km where it meets the existing Silica Thaba North 132kV powerline. This route passes through communal farmland and crosses the access road once and an existing transmission line. Eskom will need to acquire 36m wide servitude to be utilized up to the proposed Aloe substation. Overhead lines make up a large part of the interconnected system. They ensure low-loss transmission and thus guarantee reliable energy supply.

#### 1.3.2 Silica Aloe Loop-in (orange) and Thabamopo Loop out (red) Alternative Route 1

This loop in and loop out line is proposed to connect the new substation to the existing Silica Thaba North 132kV powerline. The route will take the longest alignment from the proposed substation to the existing Silica Thaba North 132kV powerline. The powerline avoids the existing gravel road but however crosses an existing powerline and the River.

### 1.4 Proposed substations

A single substation has been proposed for the development. Two substations were proposed for assessment and are described as follows.

#### 1.4.1 Proposed Aloe Substation (purple)

The proposed substation is located north of the Lepelle pipeline will cover an extent of 2 hectares with a capacity of 132kV. The proposed location consists of rubble, footpaths and informal tracks. The ground is flat and suitable for the construction of the 132kV substation.

### 1.4.2 Aloe Substation (yellow)

The proposed substation is located south of the Lepelle pipeline and will cover an extent of 2 hectares with a capacity of 132kV. There are existing 11kV powerlines and there is also a Lepelle water pipeline that transects the area. This proposed location is situated within the prominent granite outcrop in the northern portion of the project area.

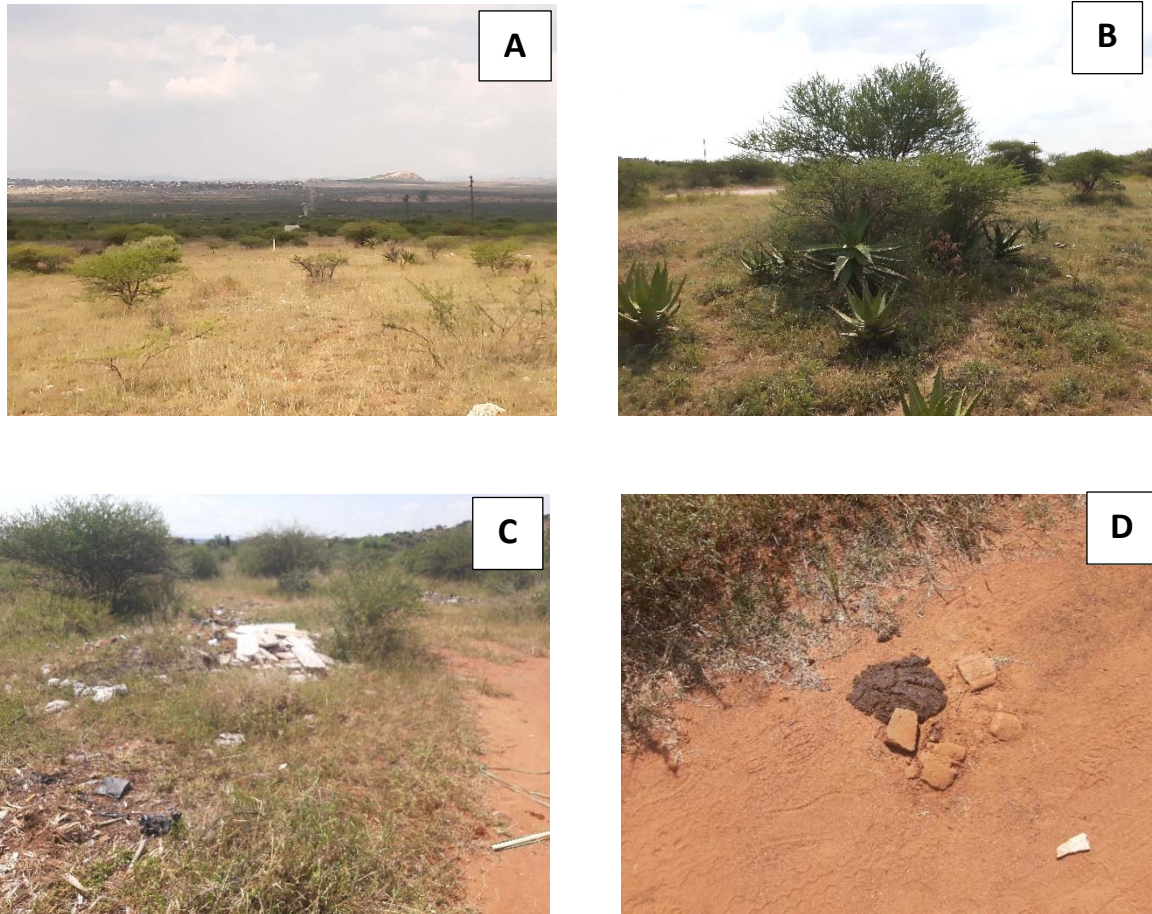
### 1.5 Status Quo of the site and Surrounding Land Uses

The project area is located in a region characterised undeveloped land, historical farmland and subsistence farming, as well as medium- and high-density residential areas within a largely rural setting. The Nobody Township's industrial park has been established east of the northernmost hill and north of the R71, where factories have been established. Prominent natural features in the vicinity of project area include various distinctive granite outcrops and the Diep River, a tributary of the Sand River that traverses the project area in the east, approximately 800m east of the proposed project infrastructure.

The existing Eskom Aloe Substation lies south of the R71 where a municipal water pipeline goes through. The construction of the new Aloe Substation and LILO powerlines will further increase distribution capacity to ensure power supply for new developments in Polokwane. The proposed 132kV powerline will connect to the existing Silica North Line to the south.

The study area is traversed by at least three power lines. Some type of township development was initiated in the area east of the southbound road leading from the R71, where long strips of land resembling roads were cleared of vegetation. The study area covers about 50ha and the proposed substation will be located here. The original vegetation type is the Pietersburg false grassland; however, the area is increasingly being pioneered by acacia species due to past and present farming practices. Typical of the hills and outcrops in the Polokwane area, the *species Aloe marlothii* is abundant as they thrive in the ashy soils caused by human occupation. Quartzite outcrops occur in the area. Some of the environmental site conditions noted on site are presented in **Figure 3**.





*Figure 3: A – Bushveld Vegetation in the area, B – Acacia hebeclada plant species, C – Dumped waste on the site, D – Animal faeces to indicate the presence of farming on the surrounding areas*

The vegetation around the site is mainly thorn bushveld. As shown in **Figure 3**, the site is degraded and characterised by rubble, waste, animal faeces and footpaths that have caused degradation of vegetation. Ground cover is full of patches at 80% and where there is no groundcover there is degradation. The ground is flat and suitable for construction of a substation. The site also consists of 11/22 kV existing powerlines and there are three ridges that surround the alternative area and the farmlands with livestock. Please refer to more figures on pages overleaf.



Figure 4: A kraal observed on site with livestock



Figure 5: A ridge with an existing telecommunication mast, observed from the southern direction of the proposed site



Figure 6: Second ridge observed from the northern direction of the proposed site and powerlines



Figure 7: Third ridge observed from the south-eastern direction of the proposed site and powerlines

## 1.6 Project Motivation

### i. Need and Desirability

In terms of 3(1)(f) of Appendix 1 of NEMA 2014 EIA Regulations, as amended, a Basic Assessment must include a discussion of the need and desirability for a proposed project. Needs and desirability support the Environmental rights as set out in Section 24 of the Constitution, as well the relevant municipal plans such as Municipal Integrated Development Plans (IDP), Spatial Development Frameworks (SDF) and Environmental Management Frameworks (EMF). Needs and desirability supports Sustainable development by ensuring that the proposed activity is ecologically, economically and socially sustainable.

The project will ensure that the current power supply is strengthened in the area (Capricorn District: Polokwane Local municipality and Lepelle -Nkumpi Local Municipality). Currently electricity power

supply in the area is very poor thus unable to meet the basic needs for socio-economic development and upliftment in the area. In the broader sense the proposed project will support various electricity requiring a stronger grid connection.

From an overall environmental sensitivity and planning perspective, the proposed grid connection supports the broader strategic context of the 2 of 3 Municipalities as it is directly linked to the strategic objectives of these Municipalities, which is a stronger and more reliable electrification network. Moreover, a strong network is considered a driver for economic growth in the region as per the Capricorn District Municipality's Integrated Development Planning (IDP). In addition, the Guideline on need and desirability of a project (DEA, 2017) highlights the obligation for all proposed activities that trigger the EIA regulations to be considered in terms of the spatial planning context, broader societal needs and financial viability. This information allows the authorities to contemplate the strategic context of a decision on the proposed project.

#### ii. Project Benefits

The existing power lines and the substation are becoming heavily loaded and are predicted to reach their full capacity very soon. The current status of the distribution network to the Polokwane CLN is clearly not ideal to satisfy the electricity requirements of the customers in the area. Therefore, this proposed solution will provide additional capacity in the area and this will enable the following benefits:

- a) Reinforcement of the local network's reliability by ensuring a back-up supply to the area,
- b) maintain quality of supply to customers supplied from Aloe Substation, and
- c) meet the escalating electricity demands in the greater Polokwane area.

In situations like this, Eskom considers all possible network reinforcement options to alleviate the supply problem. On occasions, it may be possible to reinforce the distribution network without erecting new lines or cables, through technological improvements which permit the existing distribution network to be worked harder. However, in addition to the network are required, the technical, financial and environmental implications of all possible solutions are assessed before making the final decision. Ultimately, the most cost-effective solution, which is to provide another substation and powerlines in the area, will economically justify the "electricity supply reliability" in order to support projects and local residential developments in the area.

### iii. Local Benefits

The local community will benefit from the activity through job creation in the construction phase as well as during the operational phase of the development. During the construction phase of the development, local labour will be sourced and where possible socially responsible local service providers will be used in order to benefit the maximum amount of people. The project will also improve and strengthen current power supply in the area.

## 1.7 Infrastructure Description

The infrastructure of the proposed developments consists of 100m x 100m 132 kV Substation, which will cover a footprint of 2 hectares. Specific details regarding the number and the type of towers and other support infrastructure associated with the power lines will be confirmed during the detail design phase and following the environmental authorisation. Currently it is proposed that the monopole structure (**Figure 8**) will be used to support the power lines. Self-supporting strain towers will be utilised at bend points along the line (**Figure 9**). Steel monopole structures are likely to be used for this proposed development, as they have also been widely used in similar developments and in the existing powerlines, as noted on site.



*Figure 8: Example of a steel monopole structure noted on site*

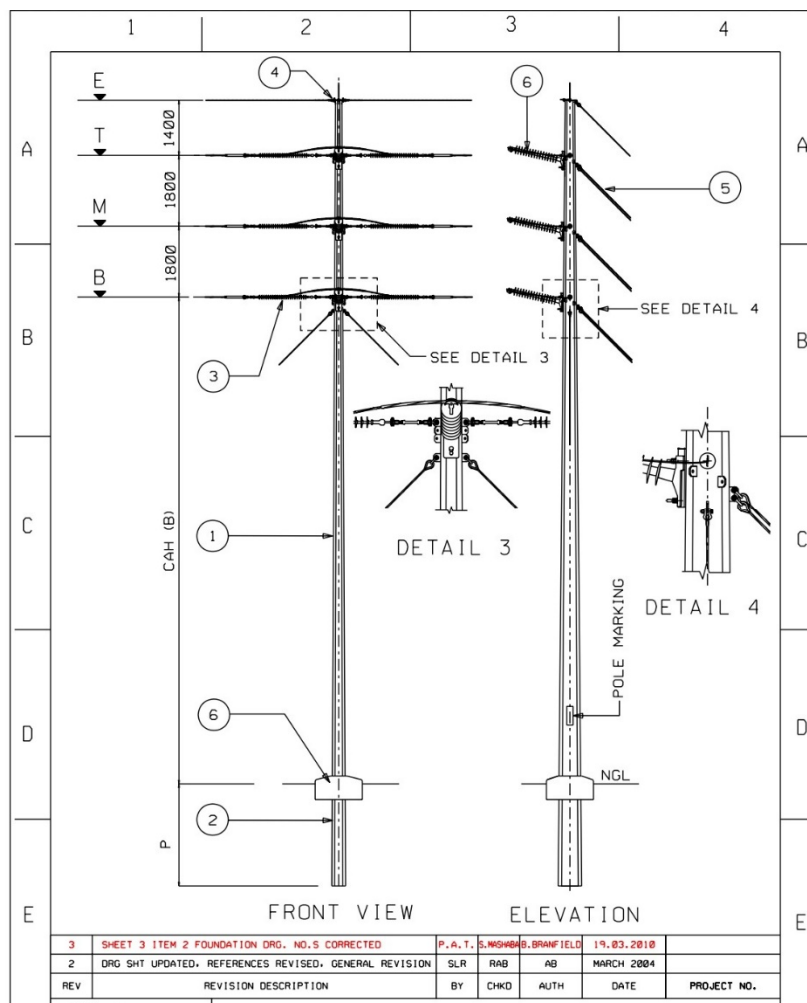


Figure 9: Stayed Angle Strain Structure Design

Steel monopole towers are considered and favoured for this project due to the following reasons:

- A more compact size, horizontally and vertically.
- A smaller footprint or area.
- A lower installation cost.
- More options for strain structures (bolted base or planted base and stays).
- More options for intermediate structures (bolted base or planted base).
- A flexible design - the design methodology enables structures to be optimized for a particular line or application, for example, height, size, load capacity and number of circuits.

### 1.8 Servitude Requirements

Generally, 132 kV power lines require a servitude width of between 30m and 52m. The proposed power line will require a servitude width of 36m (18m either side of the centre line of the power line).

On receipt of an approval of the final corridor by the environmental authorities and after negotiations with landowners, the final definition of the centre line for the power line and coordinates of each bend in the power line will be determined. Optimal tower sizes and positions will be identified and verified using a ground survey (in terms of the Environmental Management Programme (EMPr) requirements). Any extra area required outside the servitude shall be negotiated with the relevant land occupiers and approved by Eskom. All areas marked as no-go areas, identified by means of the EIA process, located inside the servitude shall be treated with the utmost care and responsibility.

## 1.9 Line Clearances

High voltage power lines require a large clearance area for safety precautions. The Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) provides for statutory clearances. If any tree or shrub in other areas would interfere with the operation and/or reliability of the distribution line it will be trimmed or completely cleared. The clearing of vegetation will take place, with the aid of a surveyor, along approved profiles and in accordance with the approved EMPr, and in accordance with the Eskom minimum standards (**Table 4**) for vegetation clearing for the construction of the proposed new distribution lines.

*Table 4: Minimum standards to be used for vegetation clearing for the construction of a new line*

Item	Standard	Follow up
Centre line of the proposed Sub-distribution line.	Vegetation to be cut within 50mm of the ground. Treat stumps with herbicides.	Re-growth shall be cut within 50mm of the ground and treated with herbicides, as necessary.
Inaccessible valleys (trace line).	Clear a 1m strip for access by foot only, for the pulling of a pilot wire by hand.	Vegetation not to be disturbed after initial clearing – vegetation to be allowed to re-grow.
Access/service roads.	Clear a maximum (depending on tower type) 4m wide strip for vehicle access within the maximum 8 m width, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil.	Re-growth to be cut at ground level and treated with herbicide as necessary.
Proposed tower position and proposed support/stay wire position.	Clear all vegetation within proposed tower position and within a maximum (depending on tower type) radius of 4m around the position, including de-stumping/cutting stumps to ground level, treating with a herbicide and re-compaction of soil. Allow controlled agricultural	Re-growth to be cut at ground level and treated with herbicide as necessary.

	practices, where feasible.	
Indigenous vegetation within servitude area (outside of maximum 8m strip).	Area outside of the maximum 8 m strip and within the servitude area, selective trimming or cutting down of those identified plants posing a threat to the integrity of the proposed distribution line.	Selective trimming.
Alien species within servitude area (outside of maximum 8m strip).	Area outside of the maximum 8 m strip and within the servitude area, remove all alien vegetation within servitude area and treat with appropriate herbicide.	Cut and treat with appropriate herbicide.

## 1.10 Required Services

### 1.10.1 Access Road

A vehicle access road is usually required to be established to allow access along the entire length of the servitude. Access is required during both the construction and operation/maintenance phases of the line life cycle. A 200m long access road will be required for access to the new Aloe substation. The proposed power line is situated along the farms with existing routes that already consist of access roads. There are adjacent farms along the proposed power line with enough access that will be used to access the power line corridor. Areas without access points and roads will be negotiated with landowners and are to be established during the construction phase.

### 1.10.2 Construction Site Camps

Normally the power line contractor would set up at least one site camp, but this does not necessarily need to be near the power line Corridor. The contractor may, however, prefer to use a fully serviced site in another location. It is likely that a number of construction camps would need to be established for the contract period.

### 1.10.3 Sewage

A negligible sewage flow is anticipated for the duration of the construction period. Onsite treatment will be undertaken through the use of chemical toilets. The toilets will be serviced periodically by the supplier.

#### 1.10.4 Solid Waste Disposal

All solid waste will be collected at a central location at each construction site and will be stored temporarily until removal to an appropriately permitted landfill site in the vicinity of the construction site.

#### 1.10.5 Electricity

Diesel generators will be utilised for the provision of electricity during construction as well as the nearby available sources i.e. the existing Aloe Substation.

#### 1.10.6 Applicable NEMA Listed Activities

According to the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 as amended, a Basic Assessment process is required for the proposed development as it triggers several listed activities. A 'listed activity' refers to any activity that is presented under any of the three Listing Notices that have been published under Government Gazette No 40772 on 07 April 2017 and are an amendment of the 2014 Regulations that were published under Government Gazette No. 38282 on 04 December 2014. According to the NEMA Environmental Impact Assessment (EIA) Regulations, 2014 as amended, a Basic Assessment process is required for the proposed development for the following activities:

Table 5: Key Listed Triggered Activities

Activity Number	Activity Description	Applicability to project
<b>GNR 983: (Listing Notice 1)</b>		
Activity 11	<i>The development of facilities or infrastructure for the transmission and distribution of electricity—</i> <i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</i> <i>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more;</i> <i>excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</i> 1 <i>(a) temporarily required to allow for maintenance of existing infrastructure;</i> 2 <i>(b) 2 kilometres or shorter in length;</i> 3 <i>(c) within an existing transmission line servitude;</i> <i>and</i> <i>(d) will be removed within 18 months of the commencement of development.</i>	<i>The development of a New substation to connect to the existing Silica-North 132kV line.</i>
Activity 27	<i>The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—</i> <i>(i) the undertaking of a linear activity; or</i>	<i>Indigenous vegetation will need to be cleared (i.e. permanent removal) in a Critical Biodiversity Area to</i>



	<i>(ii) maintenance purposes undertaken in accordance with a maintenance management plan;</i>	accommodate the construction of a 2-hectare (20 000m <sup>2</sup> ) substation.
<b>GNR 985: (Listing Notice 3)</b>		
Activity 3	<p><i>The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower—</i></p> <p><i>(a) is to be placed on a site not previously used for this purpose;</i></p> <p><i>and</i></p> <p><i>(b) will exceed 15 metres in height—</i></p> <p><i>but excluding attachments to existing buildings and masts on rooftops.</i></p> <p><b>E. Limpopo</b></p> <p><i>i. Outside urban areas:</i></p> <p><i>(aa) A protected area identified in terms of NEMPAA, excluding conservancies; (bb) National Protected Area Expansion Strategy Focus areas;</i></p> <p><i>(cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</i></p> <p><i>(dd) Sites or areas identified in terms of an international convention;</i></p> <p><i>(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;</i></p> <p><i>(ff) Core areas in biosphere reserves; or</i></p> <p><i>(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve; or</i></p> <p><i>ii. Inside urban areas:</i></p> <p><i>(aa) Areas zoned for use as public open space; or</i></p> <p><i>(bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.</i></p>	<p><i>The construction of a 65m Telecommunication tower within the substation footprint but not attached to the substation buildings/roofs.</i></p>
Activity 12	<p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan</i></p> <p><b>c. Limpopo</b></p> <p><i>i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</i></p> <p><i>ii. Within critical biodiversity areas identified in bioregional plans;</i></p> <p><i>iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning.</i></p>	<p><i>Species of conservation concern (SCC) will need to be cleared (i.e. permanent removal) in a Critical Biodiversity Area to accommodate the construction of a 2-hectare (20 000m<sup>2</sup>) substation.</i></p>

The potential impacts on the environment that are associated with the above-mentioned listed activities must be considered, investigated, assessed and reported to DEFF as the Competent

Authority (CA hereafter) based on Section 43(2) of NEM: WA, 2008, as the Licensing Authority. The Basic Assessment process for the New Aloe Substation and LILO powerlines, will be conducted in accordance with Section 19 -20 and Appendix 1 of the NEMA EIA regulations, 2014, as amended.

#### **1.10.7 Objectives of the Basic Assessment Process**

The main objectives of the Basic Assessment, in terms of the regulatory requirements stipulated in *Appendix 1* of the 2014 NEMA EIA Regulations, are to:

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
  - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
  - (ii) the degree to which these impacts—
    - (aa) can be reversed;
    - (bb) may cause irreplaceable loss of resources; and
    - (cc) can be avoided, managed or mitigated; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
  - (i) identify and motivate a preferred site, activity and technology alternative;
  - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
  - (iii) identify residual risks that need to be managed and monitored.

#### **1.11 Structure of the Basic Assessment Report**

This report has also considered the requirements outlined in Appendix 1 of the NEMA EIA Regulations 2014, as amended regarding the content of the Basic Assessment Report (BAR hereafter). In addressing these requirements, this BAR is divided into **10 Chapters**, the contents of which will be presented as follows in this report:

- **Chapter 1** introduces the background to the development proposal and profiles its proponents. Furthermore, this chapter provides an indication of the BA process that will be followed as well as providing insights into the legislative requirements that have resulted in the need for this process;
- **Chapter 2** provides the legislative framework for the BA process and the context of the proposed development. The legislative framework includes national and provincial legislation as well as planning framework which will have to be considered in the BA process;
- **Chapter 3** is a detailed description of the adopted Basic Assessment Methodology for the project;
- **Chapter 4** is a description of the receiving environment associated with the proposed activities;
- **Chapter 5** is a description and comparative assessment of the alternatives that were considered for the project;
- **Chapter 6** details the Public Participation Process undertaken for the project. It also summarises key outcomes of the process;
- **Chapter 7** discusses the Impact Assessment Methodology;
- **Chapter 8** is a description and assessment of environmental impacts;
- **Chapter 9** provides the Environmental Impact Statement conclusion to the report as well as recommendations; and.
- **Chapter 10** presents a Bibliography for the report.

### 1.12 Project Team

This section of the BAR provides the project team that is responsible for carrying out tasks associated with the Basic Assessment process, including contact details, of the key stakeholders (Applicant's representative, Environmental Assessment Practitioner and the Project Reviewer. These details are outlined in **Table 5** below.

*Table 6: Applicants Details*

Applicant's representative	Environmental Practitioner	Impact	Project Reviewer
<b>Name:</b> Tshifhiwa Matamela <b>Designation:</b> Environmental Manager: Limpopo OU Tel: (015) 230 1489 Cell: 079 745 4296	<b>Name:</b> Nyaladzi Nleya <b>Designation:</b> Environmental Impact Assessment Practitioner <b>Tel:</b> 011 312 2537		<b>Name:</b> Nkhensani Khandlhela <b>Designation:</b> Principal Environmental Assessment Practitioner

<b>e-mail:</b> <a href="mailto:matamete@eskom.co.za">matamete@eskom.co.za</a>	<b>Fax:</b> 011 805 1950 <b>e-mail:</b> <a href="mailto:environment@gaenvironment.com/">environment@gaenvironment.com/</a> <a href="mailto:nyaladzin@gaenvironment.com">nyaladzin@gaenvironment.com</a>	<b>Tel:</b> 011 312 2537 <b>e-mail:</b> <a href="mailto:nkhensanik@gaenvironment.com">nkhensanik@gaenvironment.com</a>
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This BAR was prepared by **Nyaladzi Nleya**, an Environmental Assessment Practitioner (EAP) employed by GA Environment. His CV is included as **Appendix I2** of this report. **Nyaladzi** holds a B.Sc. (Hons) in Applied Environmental Science degree with 10 years of working experience in the Environmental Management Field. Nyaladzi specialises in, among various environmental management tools, Integrated Environmental Management (IEM), Environmental Impact Assessments (EIAs), Basic Assessments (BAs). Nyaladzi has working knowledge of Spatial Analyses and Mapping with the use of ArcGIS. He has been involved in various footprint and linear projects, mixed-use developments as well as Conservation Planning and Biodiversity Management.

### 1.13 Specialist Studies

The Basic Assessment process included the following specialists' assessments: Avifaunal, Terrestrial Biodiversity, Wetland Delineation, Geotechnical, Heritage and Palaeontological Impact Assessments. Their details are outlined in the **Table 7** below:

Table 7: Specialist studies and contact details

Avifaunal Impact Assessment		
Company Name	Contact Person	Contact Details
Feathers Environmental Services	Megan Diamond	<a href="mailto:megan@feathersenv.co.za">megan@feathersenv.co.za</a> Tel: (082) 683 0970
Geotechnical Impact Assessment		
Company Name	Contact Person	Contact Details
GCS: Water an Environmental Consultants	Nino Welland	<a href="mailto:ninow@gcs-sa.biz">ninow@gcs-sa.biz</a> Tel: (011) 803 5726
Terrestrial Biodiversity Impact Assessment		
Company Name	Contact Person	Contact Details
Field and Form Landscape Science	Michelle Pretorius	<a href="mailto:michelle@fieldandfom.co.za">michelle@fieldandfom.co.za</a> Tel: (082) 442 7637
Wetland and Riparian Risk Impact Assessment		
Company Name	Contact Person	Contact Details
The Biodiversity Company	Andrew Husted	<a href="mailto:info@thebiodiversitycompany.com">info@thebiodiversitycompany.com</a> Tel: (081) 319 1225
Heritage and Palaeontological Impact Assessment		
Company Name	Contact Person	Contact Details
Vhufa Hashu Heritage Consultancy	Frans Roodt	<a href="mailto:fransroodt2454@gmail.com">fransroodt2454@gmail.com</a> Tel: (083) 770 2131

The specialist studies are attached as **Appendix F** of this report.

#### **1.14 Assumptions, Gaps and Limitations**

The following key gaps, assumptions and limitations were made when conducting and compiling this BA:

- The information provided by Eskom is accurate, adequate and unbiased, and that no information that could change the outcome of the BA process has been withheld;
- The information obtained from the specialist studies undertaken for this project is accurate and objective. Modelled biodiversity databases have accuracy limitations and as a result, must be ground truthed for verification;
- The emphasis of the field assessment was on the main development footprint areas, including the Aloe Substation alternatives, while a broader assessment was undertaken within the 1km corridor. The section within 1km north of the R71 roadway was not assessed due to access constraints and this being area highly unlikely to be impacted by the proposed project;
- The results of the Terrestrial Biodiversity field assessments are based on a single site assessment, undertaken on 23 May 2020. The assessment period falls outside of the typical summer rainfall period during which field assessments are generally recommended to take place, due to the restrictions of the Covid-19 nationwide lockdown. Although the veld was relatively dry at the time of assessment, floral species identification was still possible; and
- The scope of this study is limited to identification and assessment environmental impacts associated with the proposed location for the New Aloe Substation and LILO powerlines.

It can be thus concluded that other than the above, the information provided in this report is adequate for the purposes of the current impact assessment and decision making regarding the project.

## 2 LEGISLATIVE FRAMEWORK

This section of the BAR discusses applicable legal provisions and the legal context for the proposed New Aloe Substation and LILO powerlines. It provides a review of legislation, regulations, policies and guidelines, which are applicable to, or have implications, for the proposed project. The contents of this report are based on a review of the information that was available at the time of the compilation of the report. The discussion in this chapter is by no means an exhaustive list of the legal obligations of the applicant in respect of environmental management for the proposed development.

### 2.1 National Legislation

#### 2.1.1 Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)

The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following:

*“...everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.*

The State must therefore respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate.

#### 2.1.2 National Environmental Management Act, 1998 (Act No. 107 of 1998)

In order to bring section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) into realisation, the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) was promulgated to serve to *‘provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith’*. NEMA is main Environmental Legislation in South Africa and other Specific Environmental Management Acts (SEMA’s) support its objectives.

Examples of SEMA's include the following:

- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004); and
- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

Some specific Environmental Management Legislation is also discussed in Sections 2.1.3 to 2.1.8. The key principles of NEMA as outlined in Section 2 can be summarised as follows:

- sustainability must be pursued in all developments to ensure that biophysical and socio-economic aspects are protected or;
- there must be equal access to environmental resources, services and benefits for all citizens including the disadvantaged and the vulnerable. Adverse environmental impacts shall be distributed fairly among all citizens;
- environmental governance must include the participation of all Interested and Affected Parties who must be catered for to allow their effective participation;
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably; and
- The polluter pays principle must be applied in all cases where any person has caused pollution or undertaken any action that led to the degradation of the environment.

#### *2.1.2.1 National Environment Management Act, 1998*

The National Environmental Management Act (Act No. 107 of 1998) has been amended numerous times to better meet its overall objective of the protection of the environment. The amendments to NEMA include but are not limited to:

- National Environmental Management Act, (Act No. 56 of 2002);
- National Environmental Management Act (Act No. 8 of 2004); and
- National Environmental Management Act (Act No. 46 of 2003).

#### *2.1.2.2 NEMA Environmental Impact Assessment Regulations*

In terms of section 24(2) of NEMA, the Minister and or any MEC in concurrence with the Minister may identify activities which require authorisation as these activities may negatively affect the environment. The Act requires that in such cases the impacts must be considered, investigated and assessed prior to their

implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity. The NEMA EIA Regulations guide the processes required for the assessment of impacts of Listed Activities.

The requirement for the undertaking of Environmental Impact Assessments and Basic Assessments began in 1997 with the promulgation of the EIA Regulations under the Environment Conservation Act, 1989 (ECA) (Act No. 73 of 1989). These were followed by the 2006, 2010 and 2014 regulations. **Table 8** is a summary of the progression of the EIA regulations to date.

*Table 8: Summary of the South African EIA regulations from inception to date*

<b>EIA Regulations</b>	<b>Government Gazette</b>
EIA Regulations promulgated in terms of the ECA, Act No 73 of 1989	GNR 1182 & 1183: Government Gazette No 18261, 5 September 1997
Amendment of the ECA EIA Regulations	GNR 670 and GNR 672 of 10 May 2002, Government Gazette No 23401
2006 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 385, 386 and 387 Government Gazette No 28753, Pretoria, 21 April 2006
2010 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 543, 544, 545 and 546 Government Gazette No 33306, Pretoria, 18 June 2010
2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 982, 983, 984 and 985 Government Gazette No 38282, Pretoria, 04 December 2014
<b>Current</b> Amendment of the 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 324, 325, 326 and 327 Government Gazette No 40772, Pretoria, 07 April 2017

The Basic Assessment for the proposed New Aloe Substation and LILO Powerlines is being undertaken in terms of the NEMA EIA Regulations, 2014, as amended on the 07<sup>th</sup> April 2017.



### *2.1.2.3 Geographic areas of Strategic Importance for the Development of Electricity transmission and distribution infrastructure (GN 113)*

The Department of Environment, Forestry and Fisheries appointed the CSIR and SANBI to undertake a Strategic Environmental Assessment (SEA) to identify strategic routing corridors. “The corridors are representative of South Africa’s future transmission backbone up to 2040. The corridors were identified to support Strategic Integrated Project 10 (SIP 10), which pertains to electricity transmission and distribution. “Given the strategic importance of these corridors in balancing the country’s future generation and load requirements, the SEA is advocating that electricity grid infrastructure development inside of the corridors benefit from improved regulatory treatment in the form of faster and more efficient environmental authorisation and permitting procedures. SIP 10 has been identified by the Presidential Infrastructure Coordinating Committee as a key energy-related deliverable of South Africa’s National Infrastructure Plan and the overarching National Development Plan.

The Eskom Aloe project site falls within the Strategic Transmission Corridor in terms of GN 113 and therefore the timeframe for decision making as contained in the Environmental Impact Assessment Regulations, 2014 for purposes of the applications for environmental authorisation contemplated in this Notice is 57 days.

### *2.1.2.4 Directions regarding Measures to Address, Prevent and Combat the Spread of Covid-19 relating to National Environmental Management Permits and Licences*

On the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to NEMA Permits and Licenses. The purpose of these Directions is to curtail the threat posed by the COVID -19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster, and in particular to provide directions to ensure fair licensing processes and public participation processes as required by the laws contemplated in paragraphs 5 to 8 of these Directions. These Directions apply to:

- (a) all national, local and provincial authorities who are responsible for or involved in the processes listed in paragraphs 5 to 8;
- (b) all proponents, applicants, appellants, environmental assessment practitioners, specialists, companies, interested and affected parties, commenting authorities, stack emission testers or other professionals obtaining the services or involved in the processes listed in paragraphs 5 to 8; and
- (c) other parties obtaining the services or involved in the processes listed in paragraphs 5 to 8 or holders of authorisations and licences related to the matters dealt with in paragraph 5 to 8.

At all times it must be ensured that reasonable opportunity is provided for public participation and that all administrative actions are reasonable. While the COVID-19 pandemic is a unique circumstance, the specific circumstances in each case must be considered by the EAP and the Authorities in order to determine what will

be reasonable. If in the circumstances of a particular case alternative reasonable methods to give notice to relevant organs of state, interested persons and the public are available, then the relevant licensing authority can be approached for an agreement in this regard.

The Draft BAR has been submitted as per these Directions which provide the process to be followed in undertaking public participation while ensuring that the EAPs actions curtail the threat posed by the Covid-19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster.

#### *2.1.2.5 Integrated Environmental Management (Chapter 5)*

Section 24(1) of NEMA requires that the potential impacts of projects or activities must be considered, investigated, assessed and reported to the Competent Authority, while Section 24(2) empowers the Minister (or MEC) to identify such projects or activities which require authorisation. These activities are listed in Government Notice Regulation (GNR) 327 (Environmental Impact Assessment Regulations), R 324 Listing Notice 1 (activities requiring Basic Assessment); GNR 326 Listing Notice 2 (activities requiring Scoping and Environmental Impact Assessment) and GNR 325 (activities requiring Basic Assessment dependent on provincial requirements) published in terms of Section 24D of NEMA. Section 24 (5) of NEMA empowers the Minister (or MEC) to Final regulations which provide a framework for the authorisation process, and which is provided in GNR 327 Listing Notice (7 April 2017).

In terms of Section 24F, failure to obtain environmental authorisation for listed activities constitutes an offence and, either jointly or severally, convicted persons can be fined up to R5 000 000 as well as face imprisonment for up to ten years.

#### **2.1.3 National Environmental Management: Biodiversity Act (10 of 2004): National Threatened or Protected Species Regulations and Species Lists, 2015.**

The objective of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) is to provide for the management and conservation of South Africa's biodiversity within the framework of NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The objectives of NEM: BA are:

- Within the framework of the National Environmental Management Act, to provide for:
- the management and conservation of biological diversity within the Republic and of the components of such biological diversity;

- the use of indigenous biological resources in a sustainable manner; and
- the fair and equitable sharing among stakeholders of benefits arising from bioprospecting involving indigenous biological resources;
- To give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
- To provide for co-operative governance in biodiversity management and conservation; and
- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

Chapter 4, Part 2 of the National Environmental Management: Biodiversity Act (NEMBA; Act 10 of 2004) provides for the listing of Threatened or Protected Species (TOPS). Species listed as such, in terms of the TOPS Regulations (2015) and the TOPS Lists of Species (2015), are further classified as Threatened (Critically Endangered, Endangered and Vulnerable) or Protected. The Act defines these classes as follows:

- *Critically Endangered species*: any indigenous species facing an extremely high risk of extinction in the wild in the immediate future;
- *Endangered species*: any indigenous species facing a high risk of extinction in the wild in the near future, although it is not a critically endangered species;
- *Vulnerable species*: any indigenous species facing an extremely high risk of extinction in the wild in the medium-term future; although it is not a critically endangered species or an endangered species; and
- *Protected species*: any species which is of such high conservation value or national importance that it requires national protection. Species listed in this category include, among others, species listed in terms of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). However, according to the terrestrial biodiversity studies that were undertaken, the project area is not located within any protected areas or formal conservation areas.

#### 2.1.3.1 Threatened or Protected Species Regulations (2015)

The TOPS Regulations (2015) further regulate the permit system set out in NEMBA as it applies to restricted activities involving specimens of listed threatened or protected species, where restricted activities involve those activities that have a direct impact on listed species such as hunting, catching, collecting, picking, chopping off, damaging or destroying, importing and export from Republic, possessing, keeping or exercising physical control over, breeding or propagating, conveying or translocating, selling or buying, receiving or donating or any other prescribed activity involving a TOPS specimen.

#### 2.1.3.2 Alien and Invasive Species Regulations (2014)

The NEMBA Alien and Invasive Species Regulations (2014) aim to:

- Prevent the unauthorised introduction and spread of alien and invasive species to ecosystems and habitats where they do not naturally occur;
- Manage and control alien and invasive species, to prevent or minimise harm to the environment and biodiversity; and
- Eradicate alien and invasive species from ecosystems and habitats where they may harm such ecosystems or habitats.

Alien and invasive species Categories according to the Alien and Invasive Species Regulations (2014) are as follows:

- Category 1a: Invasive species requiring compulsory control. Plants are to be removed and destroyed. Any Category 1a listed plants must be combatted or eradicated.
- Category 1b: Invasive species that require control by means of an invasive species management programme.
- Category 2: Invasive species that require a permit to carry out a restricted activity within an area, as specified in the permit. If an invasive species management programme has been developed, a person must control the listed invasive species in accordance with such a programme.
- Category 3: Any plant species identified as a Category 3 Listed Invasive Species that occurs in riparian areas, must, for the purpose of the regulation be considered to be a Category 1b Listed Invasive Species. If an invasive species management programme has been developed, a person must control the listed invasive species in accordance with such a programme.

The NEMBA Alien and Invasive Species Lists (2016) include national lists of invasive species to be read together with the Alien and Invasive Species Regulations (2014). A list of alien floral species recorded in the project area, including the applicable alien and invasive species categories, is included in the Terrestrial Biodiversity Report attached as **Appendix F3**.

#### **2.1.4 National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)**

The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) provides for a range of protected areas: protected environments, special nature reserves and nature reserves. South Africa has much valuable biodiversity outside of protected areas, but this is disappearing at an alarming rate. It has been recognised that in order to effectively conserve South Africa's biodiversity, conservation efforts must focus outside of formerly protected reserves, considering 80% of the country's most scarce and threatened habitats are privately owned. It is clearly not possible for government to purchase all the land identified as high priority in terms of habitat or threatened ecosystems to add it to our system of state-owned protected areas.

This requires a new approach to conservation extension and a shift away from reactive extension (i.e. responding to problems and enforcing regulations and permitting procedures) to proactive extension (i.e. engaging with a landowner before a problem is created) where stewardship is encouraged. For these purposes, extension officers need to be better equipped with people skills relating to relationship building, conflict resolution, land negotiation, as well as hands-on knowledge, in the form of practical guidelines for managing natural ecosystems.

The primary function of protected areas is to ensure the conservation of habitats, environmental processes and species occurring within these ecosystems. The SAPAD and SACAD are Geographic Information System (GIS) inventories of all Protected and Conservation areas in South Africa. The Protected and Conservation Areas (PACA) database<sup>1</sup> also includes data on privately owned protected areas. This Register comprises of all data required for the Register of Protected Areas (legally declared) as well as data on Conservation Areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas). According to the most recently published SAPAD (2019) and SACAD (2019) databases, **the project area is not located within any protected areas or formal conservation areas.**

Protected areas in the region include the Polokwane Nature Reserve 13km to the west of the project area, the Nawilger Private Nature Reserve approximately 19km to the southwest and the Turfloop Nature Reserve 12km to the east. One conservation area is located in the larger region, namely the extensive Kruger to Canyons Biosphere Reserve, 20km to the southeast.

Focus areas for land-based protected area expansion are large, intact and unfragmented areas of high importance for biodiversity representation and ecological persistence, suitable for the creation or expansion of large protected areas. The focus areas were identified through a systematic biodiversity planning process undertaken as part of the development of the National Protected Area Expansion Strategy (NPAES, 2008). According to the NPAES database (2010), **the project area is not located within an NPAES Focus Area.** A section of the Limpopo Central Bushveld NPAES focus area is located approximately 26km to the southwest of the study area.

### **2.1.5 National Forests Act, 1998 (Act No. 84 of 1998)**

In terms of the National Forests Act (Act No. 84 of 1998) certain tree species can be identified and declared as protected. According to this Act, protected tree species may not be cut, disturbed, damaged or destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold except under a licence granted by the Department of Agriculture, Forestry and Fisheries (DAFF) or a delegated authority. Applications for such activities should be made to the responsible official in each province. Each

application is evaluated on merit (including site visits) before a decision is taken whether or not to issue a licence (with or without conditions). Such decisions must be in line with national policy and guidelines.

An updated list of protected tree species was published under section 12(1) (d) of the National Forests Act (Act No. 84 of 1998) on 6 December 2019. In terms of section 15(1) of the National Forests Act (Act No. 84 of 1998), no person may cut, disturb, damage or destroy any protected tree or possess, collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree or any product derived from a protected tree, except under a licence or exemption granted by the Minister to an applicant and subject to such period and conditions as may be stipulated.

No indigenous forests occur in the project area. Protected tree species in terms of the National Forests Act (Act No. 84 of 1998), namely *Sclerocarya birrea subsp. caffra* were recorded throughout the southern portion of the project area in the less disturbed Bushveld habitat unit (refer to the Terrestrial Biodiversity Report attached in **Appendix F3**).

#### **2.1.6 Conservation of Agricultural Resources Act (CARA; Act No. 43 of 1983)**

Amendments to regulations under the CARA (Act No. 43 of 1983) provide for the declaration of weeds and invader plants, with weeds regarded as alien plants with no known useful economic purpose, while invader plants may serve useful purposes as ornamentals, as sources of timber and may provide many other benefits, despite their aggressive nature. Declared weeds are described as Category 1 plants, while declared invader plants with a commercial or utility value are described as Category 2 plants and ornamental species as Category 3 plants. CARA indicates that Category 1 weeds are prohibited, and that Category 2 and 3 plants must be controlled. A list of alien floral species recorded in the project area, including an indication of the alien and invasive species categories in terms of CARA is included in the Terrestrial Biodiversity Report attached in **Appendix F3**.

#### **2.1.7 National Heritage Resources Act, 1999 (Act No. 25 of 1999)**

The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following:

*Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—*

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50 m in length;*
- (c) any development or other activity which will change the character of a site—*
- (i) exceeding 5 000 m<sup>2</sup> in extent; or*
  - (ii) involving three or more existing erven or subdivisions thereof; or*
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
  - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,*
- must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

The locations of the proposed infrastructure development, namely, the substation and power lines will not directly impact on any heritage site. An informal cemetery and scattered graves were identified by the Heritage Specialist including a number of Late Iron Age and early historical period sites observed in the buffer zone of the proposed project area. Some of the sites have previously been degraded by Eskom power lines; the most recent being the Tabor Witkop power line as well as the municipal water pipeline. These sites form a continuous cultural landscape in the Polokwane area that has not been adequately researched.

### **2.1.8 Electricity Regulation Act, 2006 (Act No. 4 of 2006)**

This Act governs the control of generation and supply of electricity in South Africa and the existence and functions of the National Energy Regulator. The Act aims to establish a national regulatory framework for the electricity supply industry; to make the National Energy Regulator the custodian and enforcer of the national electricity regulatory framework; to provide for licences and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated; and to provide for matters connected therewith.

### **2.1.9 Electronic Communications Act 36 of 2005**

The Electronic Communications Act 36 of 2005 (“the ECA”) is the primary legislative instrument governing the transmission of electronic communications in South Africa. The intention of the act is to promote convergence in the broadcasting, broadcasting signal distribution and telecommunications sectors and to provide the legal framework for convergence of these sectors. The act makes new provision for the regulation of electronic communications services, electronic communications network services and broadcasting services. The Independent Communications Authority of South Africa (ICASA) is an independent regulatory body of the South African government, established in 2000 by the ICASA Act to regulate both the telecommunications and broadcasting sectors in the public interest.

### **2.1.10 Carbon Tax Act No 15 of 2019**

The Carbon Tax Act gives effect to the polluter-pays-principle for large emitters and helps to ensure that firms and consumers take the negative adverse costs (externalities) into account in their future production, consumption and investment decisions. Firms are incentivized towards adopting cleaner technologies over the next decade and beyond.

The Government of South Africa has outlined its strong commitment to play its part in global efforts to mitigate GHG emissions as outlined in the National Climate Change Response Policy (NCCRP) of 2011 and the National Development Plan (NDP) of 2012. South Africa subsequently set its own domestic targets as outlined in the Nationally Determined Contribution (NDC), which was incorporated as the South African commitment in the Paris Agreement (convened by the United Nations Framework Convention on Climate Change (UNFCCC)). South Africa ratified the Paris Agreement in November 2016. The carbon tax forms an integral part of ensuring that South Africa meets these targets. The carbon tax will initially only apply to scope 1 emitters in the first phase. The first phase will be from 1 June 2019 to 31 December 2022, and the second phase from 2023 to 2030.

The introduction of the carbon tax will also not have any impact on the price of electricity for the first phase. This will result in a relatively modest carbon tax rate ranging from R6 to R48 per tonne of CO<sub>2</sub> equivalent emitted, which is a relatively low tax rate to further provide current significant emitters time to transition their operations to cleaner technologies through investments in energy efficiency, renewables and other low carbon measures.

A review of the impact of the tax will be conducted before the second phase, after at least three years of implementation of the tax, and will take into account the progress made to reduce GHG emissions in line with our NDC Commitments.



### **2.1.11 Other National Legislation concerning or related to the environment**

Various other laws regarding the protection of the environment that are relevant to this BA include:

- Environment Conservation Act, 1989 (Act No. 73 of 1989) (as amended);
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- Land Administration Act, 1995 (Act No. 2 of 1995);
- Water Services Act, 1997 (Act No. 108 of 1997); and
- Occupational Health and Safety Act, 1993 (Act 85 of 1993).

## **2.2 Provincial Legislation**

### **2.2.1 The Limpopo Environmental Management Act, 2003 (ACT 7 OF 2003) LEMA**

The Limpopo Province is rich in natural biodiversity, with most of the flora and fauna species protected in private nature reserves and provincial parks within the province. The Limpopo Government promulgated the Limpopo Environmental Management Act (No. 7 of 2003) (LEMA) to regulate the utilisation of wildlife as well as the protection and conservation of the environment as a whole. It makes provision for a wide variety of matters regarding the environment including: protected areas; hunting of wild and exotic animals; the establishment of Wildlife Councils; inland fishing and the protection and aquatic systems; the protection of indigenous plants; the application of CITES; environmental pollution; and restrictions on development and environmental impact reports.

The objectives of the LEMA are, amongst others, to manage and protect the environment in the Limpopo Province, to secure ecologically sustainable development and responsible use of natural resources in the Province. The LEMA provides for the security, protection and conservation of plant and animal life in their natural state and lists provincially protected and specially protected animal species under Schedules 2 and 3 and wild animals under Schedule 4. No person may without a permit hunt game, or species listed in the aforementioned schedules.

Schedules 11 and 12 of this Act provide for protected and specially protected plant species. In terms of the LEMA, no person may pick, be in possession of, sell, purchase, donate, receive as a gift, import into, export or remove from the Province, or convey a protected or specially protected plant as listed. Floral and faunal species listed as protected in terms of the LEMA and occurring within the project area are indicted in Sections 6.2 and 6.4. Should any of these species fall within the proposed project footprint area and require removal or relocation, relevant permits should be obtained from the Limpopo Department of Economic Development, Environment and Tourism (LEDET).

### **2.2.2 Limpopo Conservation Plan (Version 2)**

Bioregional plans are one of a range of decision support tools provided for in the Biodiversity Act 1 that can be used to enable biodiversity conservation in priority areas. The purpose of a bioregional plan is to inform land-use planning, environmental assessment and authorisations, and natural resource management, by a range of sectors whose policies and decisions impact on biodiversity (Desmet et al, 2013). In order to facilitate and assist with the management and monitoring of biodiversity in the Province, the LEDET developed the Limpopo Conservation Plan (C-Plan) version 2 (Desmet et al., 2013). The Limpopo C-Plan serves as the current systematic biodiversity plan for the Limpopo Province.

The purpose of the Limpopo C-Plan (2013) is to inform land-use planning and development on a provincial scale and to aid in natural resource management, with one of the outputs being a map of Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs). These are classified into different categories, namely Protected Areas, CBA1 areas, CBA2 areas, ESA1 areas, ESA2 areas, Other Natural Areas (ONAs) and areas with No Natural Habitat Remaining (NNR) based on biodiversity characteristics, spatial configuration and requirements for meeting targets for both biodiversity patterns and ecological processes.

No Protected Areas are associated with the project area. It is however evident that the project area and extent of the proposed infrastructure fall almost entirely within a CBA1 area. The portion to the east of the Diep River falls within a CBA2 area. ESA2, NNR and ONA areas occur in the immediate surroundings.

### 3 BASIC ASSESSMENT METHODOLOGY

The NEMA Regulations of 2014, as amended identify three separate administrative processes for EIAs, depending on the nature of the activity. A Basic Assessment process (Listing Notice 1) is identified for those activities that have less of a possible detrimental impact to the environment. A Scoping and EIA process (Listing Notice 2) is necessary for those activities, which are identified as having more of a possible detrimental impact on the environment, whereas Listing Notice 3 relates to identified activities that would require environmental authorisation prior to the commencement of those activities in specific identified geographical areas only. The Basic Assessment process required for the clearing of indigenous vegetation include the undertaking of a Basic Assessment in line with the NEMA EIA Regulations, 2014.

#### 3.1 Pre- Consultation with the Competent Authority

A request for a pre-application meeting was submitted to the Department of Environment, Forestry and Fisheries (DEFF) on the 21<sup>st</sup> of July 2020 in order to submit a Public Participation Plan (PPP) as per the Directions regarding the measures to address, prevent and combat the spread of the COVID-19 relating to the National Environmental Management Permits and Licences issued on 05 June 2020. The approval received on the 30<sup>th</sup> of July 2020 has been provided in **Appendix D1**.

#### 3.2 Registration of the Application with the Competent Authorities

An Application Form for Environmental Authorisation was completed and will be submitted together with the DBAR to the DEFF for review and consideration. The project is classified as SIP 10 in terms of the National Development Plan, 2011 and therefore SIP confirmation has been attached to the application form. Please refer to **Appendix D1** for a copy of the application form.

#### 3.3 Public Participation Process

A Public Participation Process (PPP) consistent with Chapter 6 of the NEMA EIA Regulations 2014, as amended (Regulations 39 – 44) and the approved Public Participation Plan was followed for the project. The PPP undertaken for the project included the following:

- the identification of Interested and Affected Parties;
- the compilation of an I&AP database;
- the placement of site notices at visible and accessible locations close to the site;
- the placement of a newspaper advertisement in a local newspaper
- the distribution of Notification Letters to adjacent landowners and other parties on an on-going basis since the notification period commenced in September 2019.

The details of the PPP undertaken to date is discussed in detail in **Chapter 6** of this report.

### **3.4 Draft Basic Assessment report**

The Draft Basic Assessment Report will be issued out for Public and Authority review for the legislated period of at least 30 days. It is important to highlight that the review period was determined in line with the reckoning of days as defined in Regulation 3 of the NEMA EIA Regulations, 2014, as amended. Due to the national lockdown, some public venues remain closed therefore hard copies of the reports will not be distributed to any public place. All registered I&APs will be informed that due to the COVID-19 pandemic, only electronic versions of the report will be made available. All I&APs will be provided with a link whereby the report can be easily downloaded. Hard copies of the report will be made available only to the ward councillors and the Tribal authorities who will be able to control how the document is assessed and limit the risk of any possible contamination. The following commenting authorities were provided with a copy of the report:

- Department of Environment, Forestry and Fisheries;
- Polokwane Local Municipality;
- Capricorn District Municipality;
- Limpopo Department of Economic Development, Environment and Tourism;
- Limpopo Heritage Resources Authority;
- South African Heritage Resource Agency;
- Limpopo Department of Agriculture and Rural Development; and
- Mothiba Tribal Authority.

Proof of submission of reports to these Authorities will be provided in the Final Basic Assessment Report.

### **3.5 Requirement to submit a report generated by the national web-based environmental screening tool**

On 5 July 2019, The Department of Environment, Forestry and Fisheries gave Notice of the Requirement to submit a Report generated by the National Web-based Environmental Screening Tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended. The submission of this report is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the Environmental Impact Assessment Regulations, 2014 effective from 4 October 2019. A Screening Report was generated on 22 April 2020 and has been attached as **Appendix J** of this report. The main findings to be discussed from the screening report are listed below.

### 3.5.1 Proposed Development Area Environmental Sensitivity

**Table 9** below is a summary of the environmental sensitivities within the application study area as identified in the Environmental Screening Report and verified on site by the EAP and appointed specialists.

*Table 9: Environmental Sensitivity of Project Area (DEFF Screening Tool)*

Theme	Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Agriculture Theme		X		
Animal Species Theme			X	
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme		X		
Civil Aviation Theme		X		
Palaeontology Theme		X		
Defence Theme				X
Terrestrial Biodiversity Theme	X			

### 3.5.2 Specialist Assessments Identified

Based on the environmental sensitivities of the proposed project area, the following list of specialist assessments were identified through the Environmental Screening Report. The Specialists studies identified in **Table 10** were undertaken as the proposed construction activities will likely to have an impact on some of the sensitivities of the environment.

*Table 10: Specialists Assessments Identified*

No	Specialist Assessment	EAP Statement/Motivation
1	Agricultural Impact Assessment	<p>Although the study area has a high sensitivity agriculture theme, according to the protocol for the Specialist Assessment and minimum report content requirements for environmental impacts on agricultural resources an Agro-Ecosystem Specialist Assessment is not required for a linear development.</p> <p>Specific areas of the site are currently being used as grazing land for cattle whilst some areas are significantly disturbed and do not provide adequate grazing land. It is also noted that the proposed development also consists of a 2 hectare substation which will be a permanent structure but the proposed locations are on significantly disturbed areas of the site and constitute a small section of the site</p>

		and therefore an Agro-Ecosystem Specialist Assessment will not be required.
<b>2</b>	Landscape/Visual Impact Assessment	<p>No specific protocol has been prescribed for the undertaking of Landscape/Visual Impact Assessments. The need for visual impact is often determined by issues that may be raised by stakeholders residing in the receiving environment.</p> <p>A site assessment was undertaken as per the site sensitivity verification requirements where a specialist assessment is required but no specific assessment protocol has been prescribed. Although located in a rural setting, the study area is not considered to have intact or outstanding rural landscape qualities.</p> <p>The receiving environment is not an area of important tourism or recreation value and has no protection status such as a national park, nature reserve, heritage reserve or scenic route.</p> <p>It was therefore determined that a Landscape/Visual Impact Assessment is not required however the associated impacts have been assessed in the impact section of the report.</p>
<b>3</b>	Archaeological and Cultural Heritage Impact Assessment	The study area forms a continuous cultural landscape in the Polokwane area and graves were identified on site. A Heritage Impact Assessment has therefore been undertaken and attached as <b>Appendix F5</b> .
<b>4</b>	Palaeontology Impact Assessment	According to the DEFF screening tool report the site has a high sensitivity theme for Palaeontology. However, the project area falls within the BLUE category of SAHRA's Palaeontological Sensitivity Map, indicating LOW sensitivity, thus no palaeontological studies are required, but a chance fossil protocol for finds is required. This has been attached as <b>Appendix F5</b> .
<b>5</b>	Terrestrial Biodiversity Impact Assessment	The footprint for the proposed substation and associated LILO powerlines is located within a CBA 1 and 2 area and must be investigated for possible impacts to loss of Flora and Fauna Species, habitats or species diversity. A Terrestrial Biodiversity Assessment Report of the study area has been compiled and attached as <b>Appendix F3</b> .
<b>6</b>	Aquatic Biodiversity Impact Assessment	The proposed development footprint does not overlap any rivers or wetland areas however, a 1 km survey buffer was applied to the

		infrastructure footprint as the planners may be required to shift this infrastructure within this corridor. This corridor overlaps portions of the Diep River that runs to the east and other smaller wetland areas. This triggered the need for a wetland and riparian baseline and risk assessment. A Wetland and Riparian Baseline and Risk Assessment Report has been attached as <b>Appendix F2</b> .
<b>7</b>	Avian Impact Assessment	The habitat within which the proposed study area is located is low to moderately sensitive from a potential Red List avifaunal impact perspective. However, the proposed development includes loop in and loop out powerlines which will have a direct impact on avifaunal species during the operation of the substation. An Avifaunal Impact Assessment has been attached as <b>Appendix F1</b> .
<b>8</b>	Civil Aviation Assessment	Power lines, overhead wires and the communication tower are considered obstacles with the potential to endanger aviation navigable airspace or has the potential to interfere with the operation of navigation or surveillance systems or Instrument Landing Systems, including meteorological systems for aeronautical purposes. An application for approval of obstacles will be submitted to the South African Civil Aviation Authority (SACAA). A Civil Aviation Compliance Statement has been attached as <b>Appendix F6</b> . A comment, in writing, from the SACAA will be included in the Final BAR.
<b>9</b>	RFI Assessment	The proposed communication tower makes use of microwave frequency which is a form of electromagnetic radiation with wavelengths different to radio frequency. Therefore, the proposed communication tower is unlikely to cause Radio Frequency Interruption (RFI) and therefore an assessment is not required.
<b>10</b>	Geotechnical Assessment	Geotechnical investigations are required to determine geologic, seismologic, and soils conditions that affect the safety, cost effectiveness, design, and execution of a proposed development. Geotechnical information throughout the study area is important in respect to the construction of the foundation for the substation and the steel monopoles and therefore a Geotechnical investigation of the study area was undertaken and attached as <b>Appendix F4</b> .
<b>11</b>	Plant Species Assessment	An overview of the vegetation commonly found in the study area and extent of potential ecological sensitive habitat was obtained through consideration of the Listed Threatened Ecosystem (2011),

		Limpopo C-Plan (2013). A detailed field assessment of the project area (including the preferred development site and proposed development footprint) was undertaken to ground truth the findings of the desktop assessment and to determine the ecological condition of the project area and its surrounds. Details of plant species distribution and diversity are contained in the Terrestrial Biodiversity Assessment Report attached as <b>Appendix F3</b> .
<b>12</b>	Animal Species Assessment	A desktop assessment of animal species distribution in the study area was undertaken. A detailed field assessment of the project area was undertaken to ground truth the findings of the desktop assessment. Details of animal species distribution and diversity are contained in the Terrestrial Biodiversity Assessment Report attached as <b>Appendix F3</b> .

### 3.6 Other Supporting Documents to the Basic Assessment

As part of the Basic Assessment for the proposed development, an Environmental Management Programme (EMPr), has been compiled in line with Appendix 4 of the NEMA EIA Regulations, 2014, as amended. The EMPr provides guidelines to Eskom as the Project Developers, the Contractor as well as various other members of the technical team on how best to implement the mitigation measures for the proposed activity the site in order to avoid adverse environmental impacts. Refer to **Appendix H1** of this Basic Assessment Report for the EMPr.

### 3.7 Issuing of Environmental Authorisation

As discussed, since the application will require input from the DEFF, it is understood that following the review of the Final Basic Assessment Report, an Environmental Authorisation (EA) will be issued in terms of Section 24 of NEMA. This Environmental Authorisation will be issued to Eskom LOU as the applicant. It should be noted that the EA may state that the activity may not commence before certain conditions are complied with. The EA may also include any other conditions that DEFF considers necessary for the protection of the environment.

### 3.8 Appeal Period

After a decision has been reached by DEFF, Chapter 2 of the National Appeal Regulations 2014 makes provision for any affected person to appeal against the decision. Within 20 days of being notified of the decision by DEFF, the appellant must submit the appeal to the appeal administrator. An appeal panel may be appointed at the discretion of the delegated organ of state to handle the case. The appeal panel will then submit its



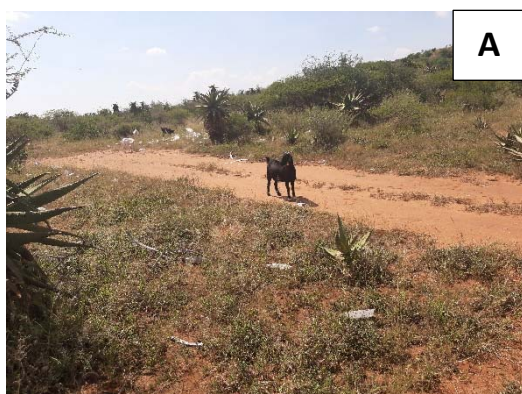
recommendations to that organ of state for a final decision on the appeal to be reached. GA Environment will communicate the decision of the Provincial Authority and the manner in which appeals should be submitted to the Minister and to all I&APs as soon as reasonably possible after the final decision has been received.

#### 4 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The environment within the study area is largely affected by human activities and still fairly natural. The site is generally characterised by various anthropogenic activities and during our site visit, footpaths, waste dumping, grazing of animals, were amongst some of the observations noted on the proposed and alternative site. There are also existing 33kV powerlines that transverse the proposed and alternative area. Environmental setting is suitable for construction of the 132kV substation, as the ground cover is flat and there are no rocky outcrops noted.

The vegetation in the project area mainly consists of acacia species and thornveld trees in some parts of the preferred and alternative site. However, the vegetation is degraded due to more illegal dumping of waste and grazing of animals. There is also a municipal pipeline that transverses on the site area, between the proposed and alternative site. Lepelle Northern Water draws 44 megalitres (ML) of water per day from Ebenezer dam to Polokwane municipal supply areas. The areas that benefit from the pipeline include Segwashi, Boyne, Ga-Mamabolo, Ga-Molepo, Mentz, Badimong, Mankweng, Ga-Thoka, Ga-Mothiba, Dalmada and the entire city supply area.

In terms of the land use in the area, agriculture is a prominent feature that currently occurs within radius of the site. There was also a dry stream noted on the eastern side of the of the project area. Generally, the landscape is suitable for construction of the new aloe substation and LILO Powerlines, as there are already signs of clearance from previous developments and the existing powerlines in the area show that the area can be utilized for similar developments. Please refer to **Figure 10** for illustrations on the environmental setting.



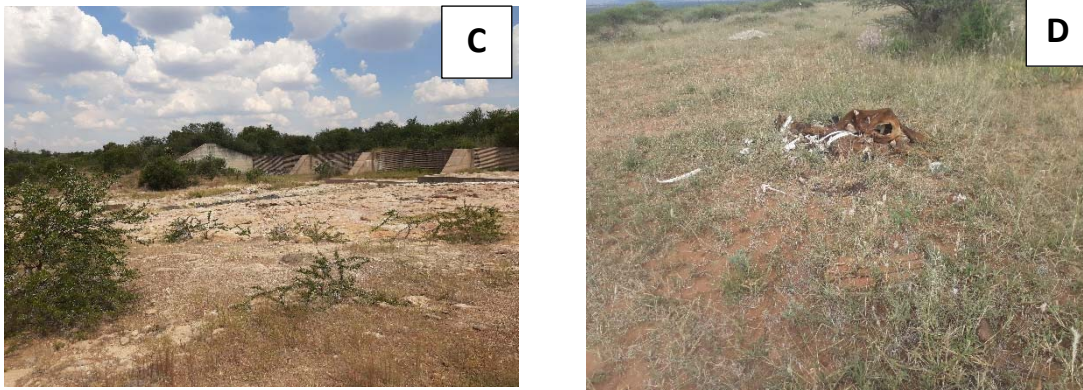


Figure 10: A – Animals grazing on site, B – Thornveld trees, C – A dry stream observed on site, D – Animal carcass observed close to the alternative area

#### 4.1 Biophysical environment

In determining the environmental sensitivities along the project area, various specialist studies were undertaken. The information pertaining to the Biophysical Environment (Vegetation, Geology, Ecology, and Drainage) is presented in this section to describe the environmental setting of the area.

##### 4.1.1 Climate

The project area is located within a summer rainfall area and has a warm climate. Most rainfall occurs between October and March with the peak period being December or January, and the Mean Annual Precipitation (MAP) for the larger region varies between 400 and 600mm, and that of the Polokwane area is around 478mm. Frost is fairly infrequent. The mean monthly maximum and minimum temperatures for Polokwane is 33.2°C and 0.6°C for October and June, respectively (Mucina & Rutherford, 2006). The figure below depicts the monthly average rainfall and temperature for Polokwane.

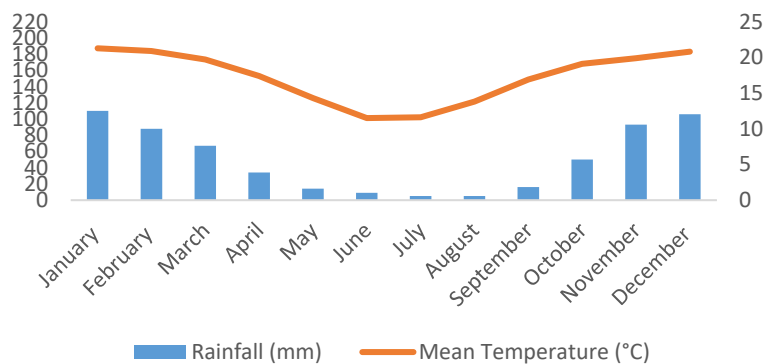


Figure 11: Monthly average rainfall and temperature for Polokwane (Source: <https://en.climate-data.org>)

An understanding of climatic conditions, particularly rainfall is crucial to the development and it assists in the planning for construction which should ideally take place during low rainfall in summer.

#### 4.1.2 Geology

The assessments undertaken for this study are supported by the visual inspection of the area, review of geological maps and findings from the geotechnical investigations. In terms of the geology observed during the site visit, rocky outcrops were noted to be prominent. According to the geotechnical investigation, the site is underlain by granodiorite, gneiss, and migmatite of the Pietersburg Group and Turfloop Granite Suite as shown in the map attached in **Appendix A**. The proposed substation is underlain by shallow (and sometime outcropping) weathered granite (northern option) or hardpan calcrete underlain by weathered granite (southern option). In terms of the proposed powerline route, there is potentially collapsible aeolian sand to an average depth of 0.6 metres below ground level (mbgl) and an average refusal depth of 1.3 mbgl in weathered granite (Welland, 2020). The substation can be founded conventionally at nominal depth; however, monopole posts should be socketed into the hard granite below 1.3 mbgl and will require the use of a power auger, in order to achieve minimum embedment depth.

For the promotion of a stable site, with no soil movement-related issues, it is extremely important that adequate drainage, both surface and subsurface, be constructed so that no water passes into the subsurface soils in and around foundation bases is possible. Drainage should be in such that any rainfall is diverted to the nearest stormwater drainage system. Areas of potential pooling or damming of rainfall on site should be carefully designed and sloped, in order to remove this water away from the foundations (Welland, 2020).

#### 4.1.3 Protected Areas

The primary function of protected areas is to ensure the conservation of habitats, environmental processes and species occurring within these ecosystems. The South African Protected Areas Database (SAPAD, 2019) and South African Conservation Areas Database (SACAD, 2019) are Geographic Information System (GIS) inventories of all Protected and Conservation areas in South Africa. This register comprises of all data required for the register of Protected Areas (legally declared) as well as data on Conservation Areas (areas responsibly managed for biodiversity conservation but not legally declared as Protected Areas). According to the most recently published SAPAD (2019) and SACAD (2019) databases, the project area is not located within any protected areas or formal conservation areas (**Please refer to Figure 12**). Protected areas in the region include the Polokwane Nature Reserve 13km to the west of the project area, the Nawilger Private Nature Reserve approximately 19km to the southwest and the Turfloop Nature Reserve 12km to the east. One conservation

area is located in the larger region, namely the extensive Kruger to Canyons Biosphere Reserve, 20km to the southeast.

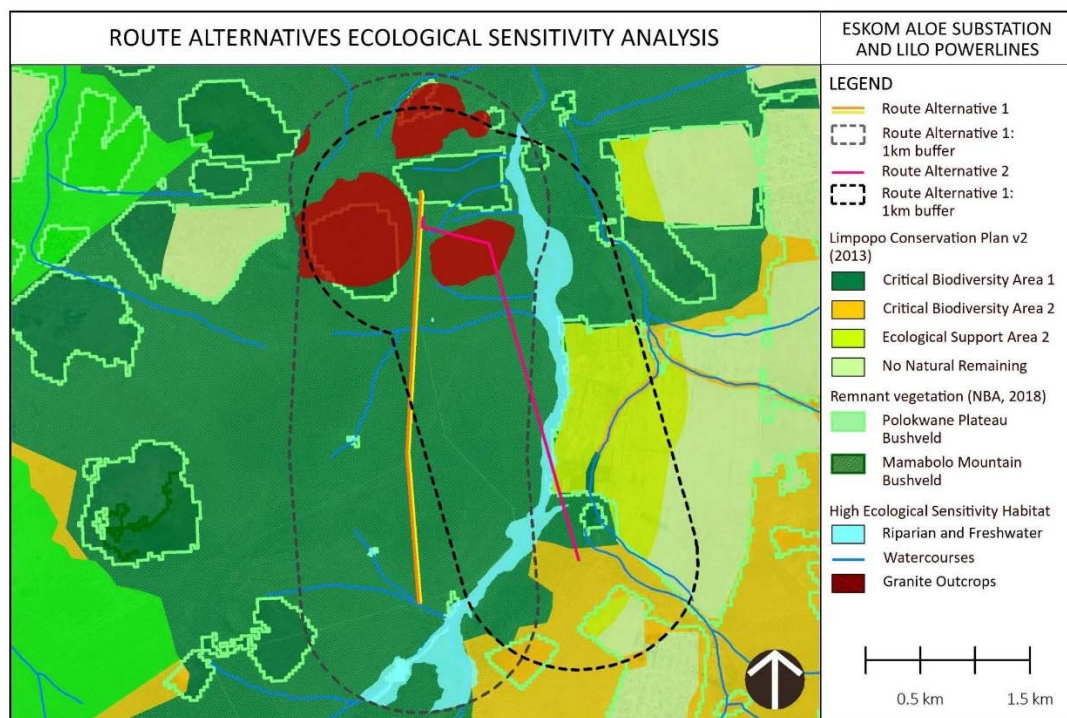


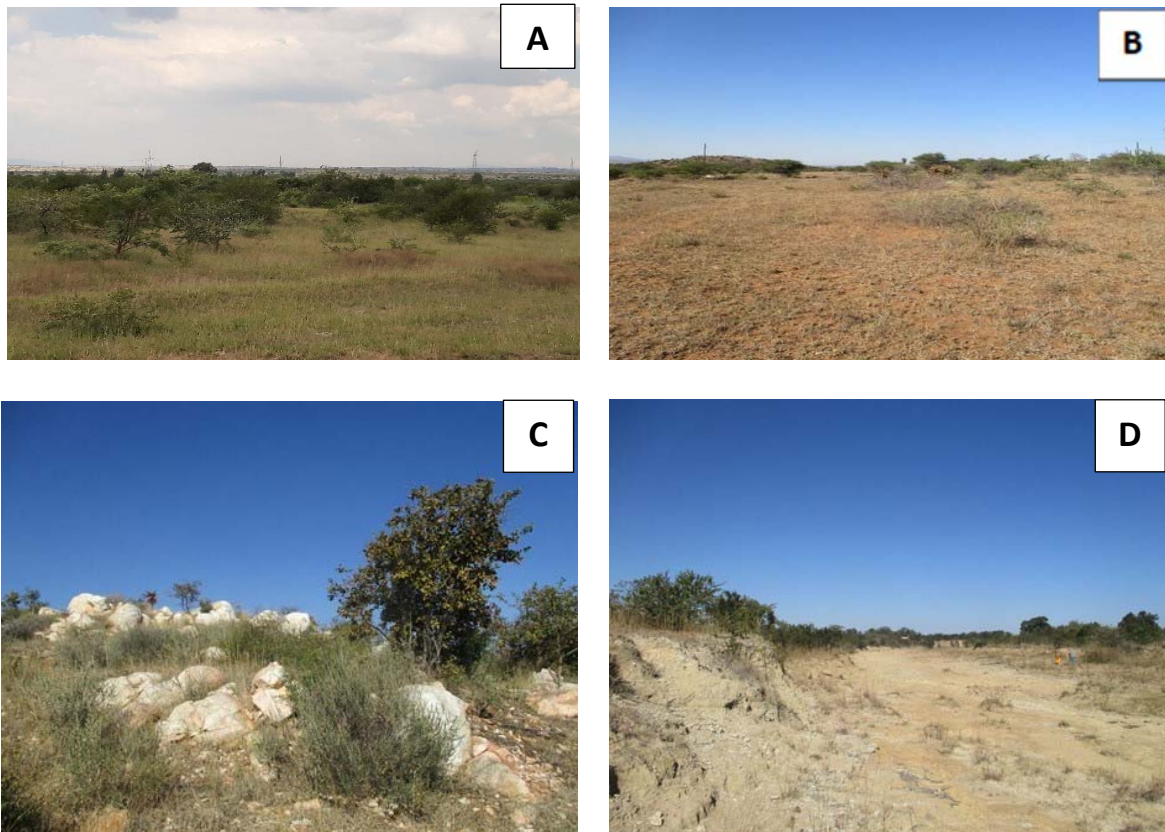
Figure 12: The location of the project area in relation to protected and conservation areas (Field and Form Landscape Science, 2020)

#### 4.1.4 Vegetation

In terms of vegetation in the area, there is a greater diversity of plants particularly within dense riparian thickets which also support larger trees. The original vegetation type is the Pietersburg false grassland, but the area is increasingly being pioneered by acacia species due to past and present farming practices. Typical of the hills and outcrops in the Polokwane area, the species *Aloe marlothii* is abundant as they thrive in the ashy soils caused by human occupation. Thornveld bush is the most prominent species in the area as it is located within the Savanna Biome (Rutherford & Westfall, 1994; Rutherford, 1997) within the Central Bushveld Bioregion of South Africa (Mucina & Rutherford, 2006). Acocks (1955) described the regional vegetation as Pietersburg Plateau False Grassveld and according to the most recent vegetation classification of South Africa (Mucina & Rutherford, 2006; NBA, 2018), the project infrastructure falls within the Polokwane Plateau Bushveld vegetation type, while the Mamabolo Mountain Bushveld vegetation type, which is typically embedded in the former, characterises the prominent rocky outcrop within the northwest of the project area.

According to the ecological specialist, four broad habitat units were identified within the project area, based primarily on floral species composition and vegetation structure, faunal species' habitat provision, the

topographical position of the habitat unit in the landscape, as well as the degree of anthropogenic impact and disturbance within the unit. The four habitats units refer to Bushveld habitat unit in the south where anthropogenic impacts have been less significant, Modified Bushveld habitat unit in the north that has been significantly impacted by historical disturbances, Granite Outcrops which occur mainly in the north of the project area and Riparian habitat associated with the Diep River floodplain in the east (**Refer to Figure 13**).



*Figure 13: A – Bushveld habitat unit in the south, B – Modified Bushveld unit in the north, C – Granite Outcrop in the north and D – Riparian habitat unit in the east (Field and Form Landscape Science: 2020)*

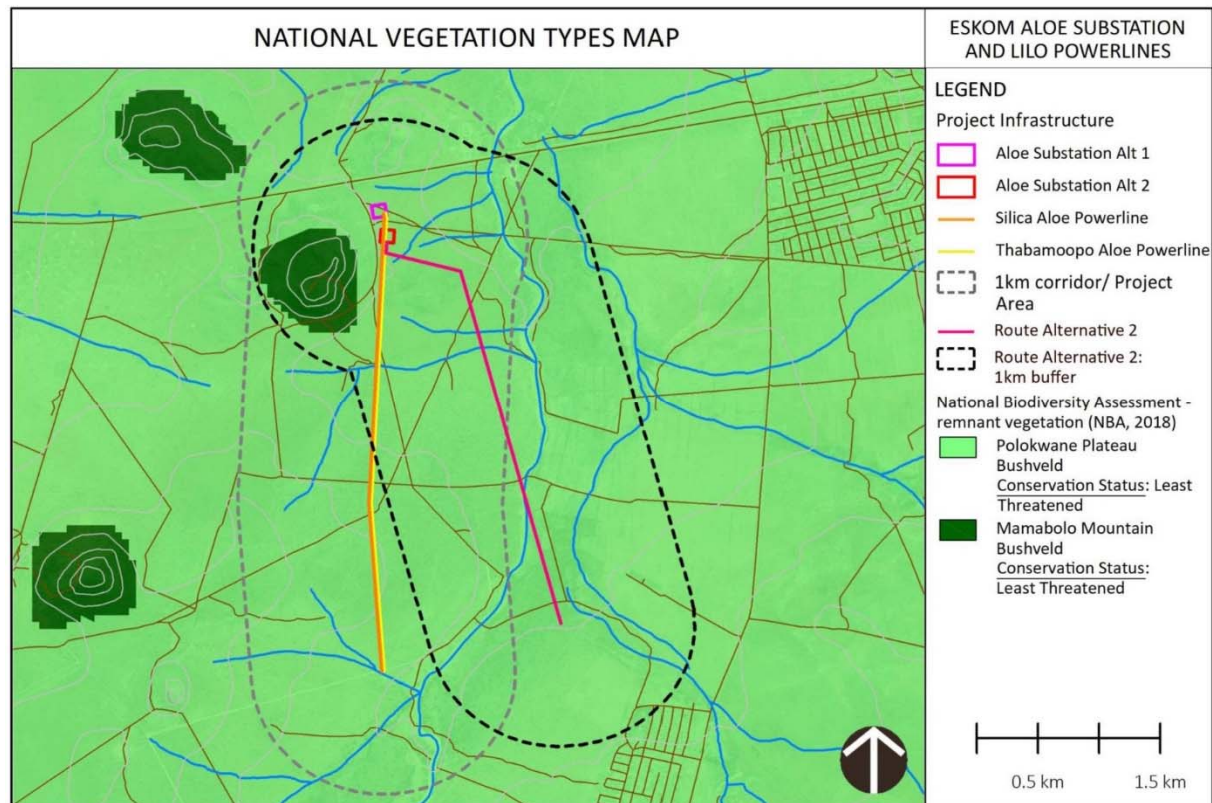


Figure 14: Vegetation types associated with the project area (Field and Form Landscape Science, 2020)

It must be noted that the project area is subject to varying degrees of disturbance, both historic and current, impacting habitats and subsequently faunal communities. These are detailed as follows:

- Historically portions of the project area have been cultivated. The transformation of the bushveld community would have resulted in the displacement of fauna.
- Sections of the project area are traversed by informal roads, tracks and powerlines.
- Informal quarrying within the rocky outcrop was noted. The issue of habitat loss is enlarged due to the unique conditions of these outcrops in comparison to the adjacent bushveld habitat.
- Signs of domestic dogs were noted that can impact faunal communities through hunting.
- Portions of the project area are utilised for cattle grazing in large fenced camps.

The development of the proposed Aloe Substation is unlikely to have a significant impact on vegetation within the region. This is attributed the relatively small development footprint, historic and current impacts to the vegetation ecology coupled with the fact that biodiversity within the footprint is not unique and is represented within the surrounding landscape. The proposed powerline alignment traverses through modified bushveld (impacted through historic cultivation) and more intact bushveld communities on the southern extent. As the entire alignment is located within a designated CBA, it is imperative that mitigation measures and

recommendations presented within this assessment (and other specialist studies) are implemented to ensure the continued functioning of these areas.

Two alternatives for the Aloe Substation and Aloe Powerline, respectively were assessed. According to the desktop assessment, Aloe Substation Alternative 1 (purple) is the preferred location alternative, but the findings of the field assessment indicate that either location assessment may be selected for development from a vegetation perspective. The desktop and field assessment indicates that powerline route alternative 2 (orange) transverses higher ecological sensitivity habitat such as the Granite Outcrop and Riparian habitat units as compared to route alternative 1 (green).

#### **4.1.5 Avifauna**

The proposed development area is located within a single primary vegetation division namely the Savanna Biome. The savanna/woodland biome contains a large variety of bird species (it is the most species-rich community in southern Africa) but very few bird species are restricted to this biome.

Although the sensitivity assessment focuses on Red List species, since the impacts associated with the construction and operation of the proposed Aloe Substation and its associated 132kV Loop-In and Loop-Out power line infrastructure are likely to be more biologically significant for these species, the impact on non-Red List species was also assessed. Furthermore, much of the mitigation recommended for Red List species will also protect non-Red List species in the study area.

The non-Red List species that have been considered for this assessment include large eagles, buzzards, kestrels, kites, owls and various water-dependent bird species. In terms of the avifaunal species on site, there were no prominent bird species observed on site. However, as the proposed development consists of powerlines, it is important to assess bird species that could be prone to electrocution and collision with electrical infrastructure.

According to the avifaunal specialist, Important Bird Areas (IBAs) are key sites for conservation – small enough to be conserved in their entirety and often already part of a protected-area network. They are responsible for one (or more) of three factors, which entail holding significant numbers of one or more globally threatened species; they are one of a set of sites that hold a suite of restricted-range species or biome-restricted species and they have exceptionally large numbers of migratory species (Pretorius, 2020). Although the project area is not located within an IBA, the Polokwane Nature Reserve (SA006) is located approximately 11km south-



west of the proposed development site and the Wolkberg Forest Belt (SA005), is located 18km east of the proposed development site (**Please refer to Figure 15**).

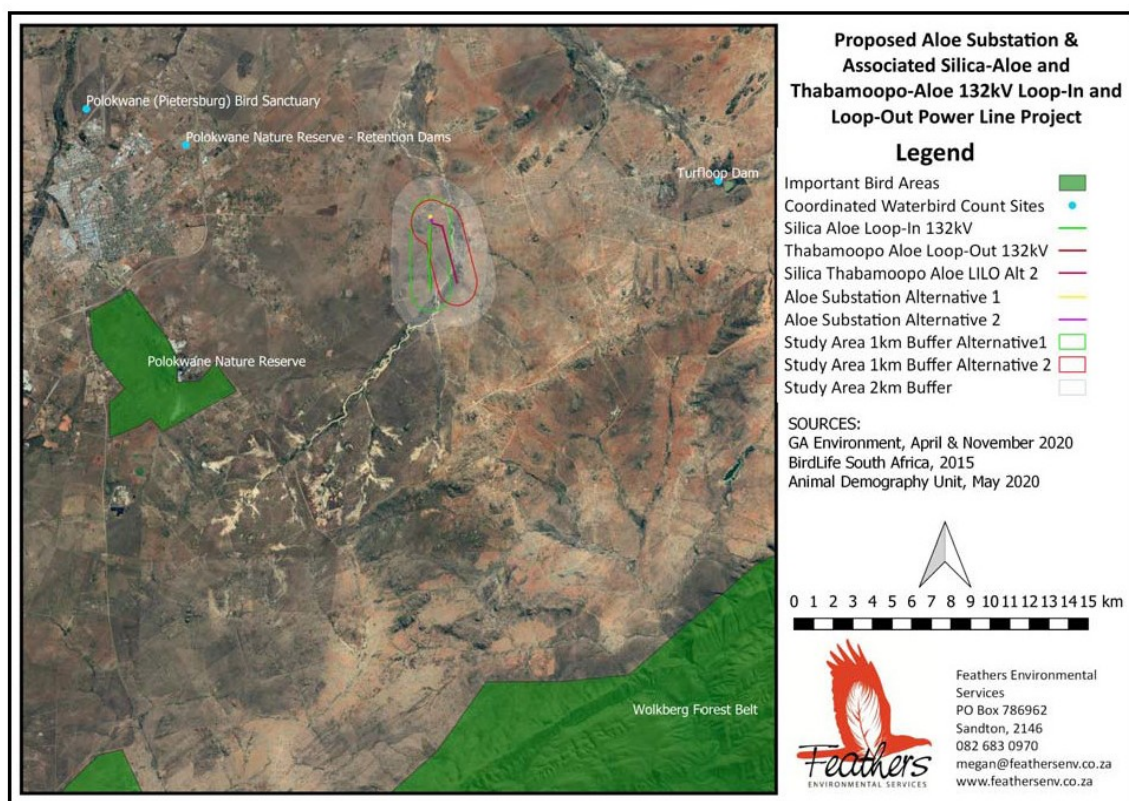


Figure 15: Regional map detailing the location of the study area in relation to Important Bird Areas (IBAs) and Coordinated Waterbird Count (CWAC) sites (Source: Feathers Environmental Services, 2020).

The Polokwane Nature Reserve supports at least 350 bird species. It is the only reserve in South Africa in which the isolated eastern population of Short-clawed Lark *Certhilauda chuana* occurs. Secretary bird *Sagittarius serpentarius* can be found here and occasionally breeds in the reserve. White-backed Vulture *Gyps africanus* and Cape Vulture *Gyps coprotheres* are occasional visitors (Diamond, 2020). The Wolkberg Forest Belt includes a number of forest reserves with large expanses of good-quality, high-altitude Afromontane forest and small patches of grassland scattered in the valleys and moist basins of the Tzaneen Mountains. Globally threatened Crowned Eagle *Stephanoaetus coronatus*, Martial Eagle *Polemaetus bellicosus* and regionally threatened Bat Hawk *Macheiramphus alcinus* breed both within the plantations and forest reserves within the IBA (Marnewick et al. 2015).

Despite the proximity of the Polokwane Nature Reserve and Wolkberg Forest Belt IBAs to the study area, and the reported occurrence of the aforementioned species within the broader study area, the construction of the proposed Aloe Substation and its associated Silica-Aloe and Thabamoopo-Aloe 132kV Loop-In and Loop-Out power lines will not negatively impact the IBAs and the species they support. In addition, it is important to

note that the heavily transformed and disturbed nature of the habitat present at the proposed Aloe Substation site and along the proposed Silica-Aloe and Thabamooopo-Aloe 132kV Loop-In and Loop-Out power line alignments is also unlikely to attract the IBA trigger species i.e. Crowned Eagle, Cape Vulture, White-backed Vulture, Pallid Harrier and Short-clawed Lark (Diamond, 2020). The more common species associated with the IBA i.e. Kurrichane Thrush *Turdus libonyanus*, Barred Wren-Warbler, White-throated Robin-Chat, Kalahari Scrub Robin, Marico Flycatcher, Crimson-breasted Shrike, Scaly-feathered Finch, Violet-eared Waxbill and Black-faced Waxbill may occur at the development site, however these species are relatively tolerant of disturbance and permanent displacement from the area, as a result of the establishment of the Aloe Substation and its associated Silica-Aloe and Thabamooopo-Aloe 132kV Loop-In and Loop-Out power lines, is unlikely (Diamond, 2020).

Most observations from the specialists' site visit were of small passerine species that are common to this area. Each of these species has the potential to be displaced by the substation and power line construction activities as a result of habitat transformation and disturbance. However, these species have persisted despite high levels of existing disturbance within the study area (Diamond, 2020). Although no red listed species were recorded on site, there are however species which are Red Listed regionally or on the NEMA Threatened or Protected Species list or regionally endemic or near-endemic which could occur in the vicinity of the site. Each Red List species' potential for occurring in a specific habitat class is indicated in **Table 11**, in addition to the type of impact that could potentially affect each species, specific to the location of this proposed development. (Diamond, 2020).

*Table 11: : Annotated list of the Red List species recorded in the relevant pentads surrounding the proposed Aloe Substation and Silica-Aloe and Thabamooopo-Aloe 132kV Loop-In and Loop-Out power line development area*

COMMON NAME	REGIONAL CONS. STATUS	GLOBAL CONS. STATUS	AV. REPORT RATE (No. of Records)	SAVANNA	RIVERS	WATERBODIES	DISPLACEMENT (HABITAT LOSS & DISTURBANCE)	POWERLINE COLLISION	POWERLINE ELECTROCUTION
Duck, Maccoa <i>Oxyura maccoa</i>	NT	NT	0.35 (1)	-	-	x	-	-	-
Eagle, Martial <i>Polemaetus bellicosus</i>	EN	VU	1.05 (3)	x	-	-	-	x	-
Eagle, Verreaux's <i>Aquila verreauxii</i>	VU	LC	0.35 (1)	x (foraging)	-	-	-	x	-
Falcon, Lanner <i>Falco biarmicus</i>	VU	LC	24.04 (69)	x	x	-	x	x	-
Flamingo, Greater <i>Phoenicopterus ruber</i>	NT	LC	0.35 (1)	-	-	x	-	x	-
Harrier, Pallid <i>Circus macrourus</i>	NT	NT	0.70 (2)	-	-	-	-	-	-

Ibis, Southern Bald <i>Geronticus calvus</i>	VU	VU	2.79 (8)	-	-	-	-	-	-
Korhaan, White-bellied <i>Eupodotis senegalensis</i>	VU	LC	2.09 (6)	-	-	-	-	x	-
Lark, Short-clawed <i>Certhilauda chuana</i>	LC	NT	25.44 (73)	x	-	-	x	-	-
Painted-snipe, Greater <i>Rostratula benghalensis</i>	NT	LC	4.18 (12)	-	-	x	-	-	-
Roller, European <i>Coracias garrulus</i>	NT	LC	2.44 (7)	x	-	-	x	-	-
Secretarybird <i>Sagittarius serpentarius</i>	VU	VU	3.14 (9)	x	-	-	x	x	-
Stork, Abdim's <i>Ciconia abdimii</i>	NT	LC	8.36 (24)	x	-	-	x	x	-
Stork, Black <i>Ciconia nigra</i>	VU	LC	0.70 (2)	-	x	x	-	x	-
Stork, Marabou <i>Leptoptilos crumeniferus</i>	NT	LC	12.54 (36)	x	-	-	x	x	-
Stork, Yellow-billed <i>Mycteria ibis</i>	EN	LC	0.70 (2)	-	x	x	-	x	-
Vulture, Cape <i>Gyps coprotheres</i>	EN	EN	26.48 (76)	x (foraging)	-	-	-	x	x
Vulture, Lappet-faced <i>Torgos tracheliotos</i>	EN	EN	0.35 (1)	x (foraging)	-	-	-	x	x
Stork, White <i>Ciconia ciconia</i>	BONN		9.06 (26)	-	x	x	x	x	-

SABAP1=Southern African Bird Atlas Project 1; SABAP2=Southern African Bird Atlas Project 2; EN=Endangered; VU=Vulnerable; NT=Near-threatened; LC=Least concern; PR=Protected; \*=Endemic; (\*) = Near-endemic; SLS = Endemic to South Africa, Lesotho & Swaziland. TOPS=National Environmental Management Act: Threatened or Protected Species

#### 4.1.6 Wetland and Hydrological conditions

According to the wetland specialist, the wetlands identified within the project area represent two hydrogeomorphic types (as defined by their drainage characteristics) namely floodplain and depression. The floodplain is called the Diep River and it is low gradient, non-perennial, system that flows in a northerly direction from its source near Manthorwane (16 km south-west of the project area) to its confluence with the Sand River 22 km North. The system is wide and, in places, braided. The flow path alternates between shallow gradient reaches characterised by wide depositional zones that allow for the accumulation of alluvial sediments and slightly steeper reaches characterised by incised banks, erosion gully's and exposed bedrock. The depression is situated along a natural drainage. The size and hydroperiod within this depression have been enhanced through the construction of a small dam wall (1.5 m high) along the downslope margin. Depressions are characterised by an enclosed topography which allows for water to accumulate within the system (Husted, 2020).

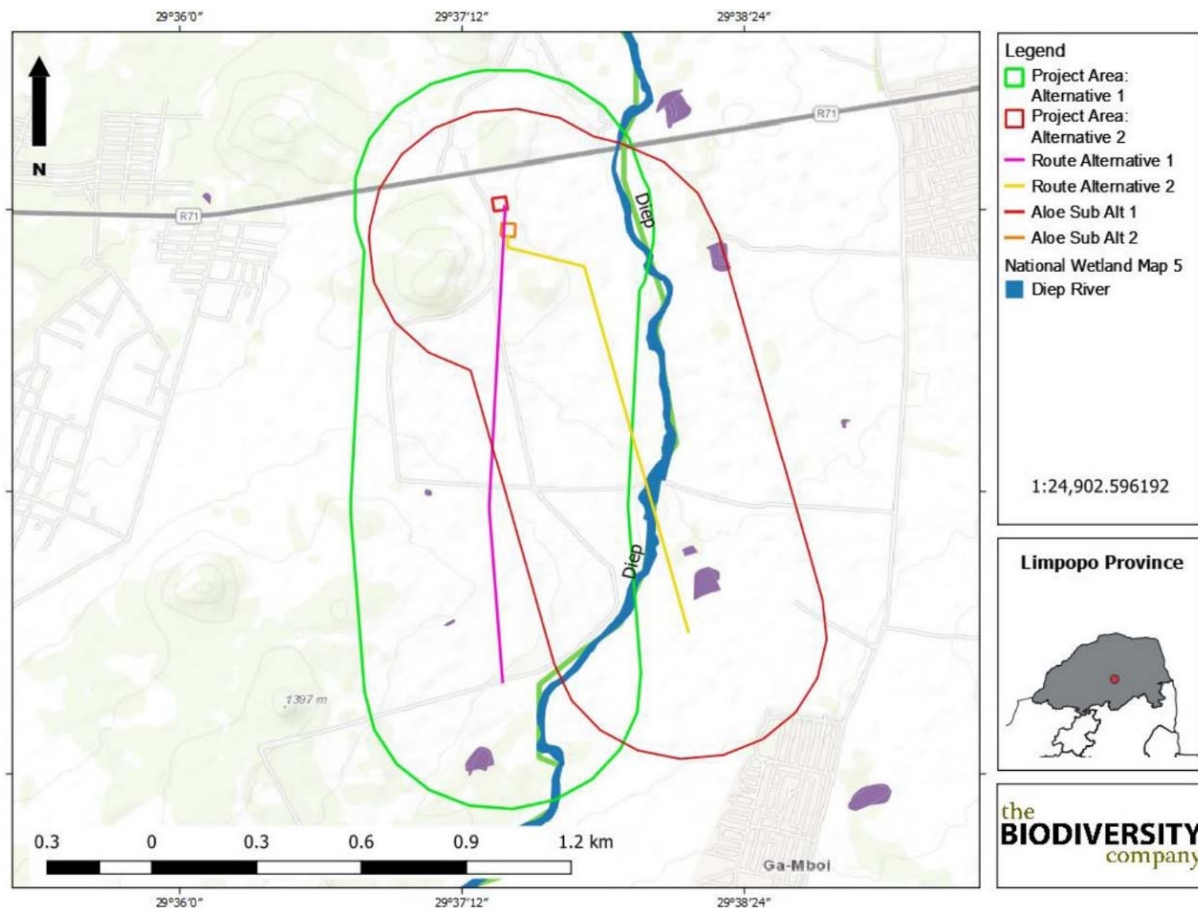


Figure 16: National Wetland Map (The Biodiversity Company, 2020)

A risk assessment was undertaken in line with the requirements of Section 21 (c) and (i) of the National Water Act, 1998, (Act 36 of 1998) to investigate the level of risk posed by proposed project, namely the installation of an electrical substation together with the distribution lines servicing it. The preferred route is located away from the Diep River and the delineated wetlands (closest is floodplain at 260 m from southern terminus) therefore the above listed impacts are unlikely to result in any appreciable level of degradation to the wetland systems, provide the prescribed mitigation is applied. Overall, all anticipated risks associated with Route Alternative 1 are considered to have a Low impact significance and therefore Water Uses must be registered through a General Authorisation.

A Pre-Water Use Licence application enquiry was submitted in August 2020 and the department determined that the water use must be authorized in terms of General Authorization. The Registration of each Water Use would be within the ambit of a General Authorisation In Terms of Section 40 of The National Water Act, 1998 (Act 36 Of 1998).

During construction (and without mitigation) the clearing and preparation of the distribution line route and storage of equipment may lead to the disturbance and degradation of wetland vegetation (towards the

southern terminus), increased bare surfaces, runoff and potential for erosion. Additionally, the excavation, levelling and installation of the towers may lead to increased sediment loads and contamination of wetlands with hydrocarbons due to leaks and spillages from machinery, equipment & vehicles as well as contamination and eutrophication of wetland systems with human sewerage and litter (Husted, 2020). However, given the distance of the proposed infrastructure from the delineated wetland (closest is floodplain at 260 m from southern terminus) these impacts are unlikely to result in any appreciable level of degradation to the wetland systems, provided the prescribed mitigation is applied.

#### **4.1.7 Land Cover**

The study area falls within a landscape which is typical of most rural parts of the north eastern Limpopo Province i.e. largely deforested open terrain (used mainly for communal livestock free range grazing), areas of bush thickening by pioneer shrubs and agricultural fields interspersed with informal settlements. The location is perfectly suited for the proposed substation and the powerline facility. The location and route chosen for the powerline is therefore favourable in achieving the desired objective of electricity distribution into the local grid while minimising the environmental impact as far as possible. The local agricultural land-use of the grazing areas will not be adversely affected once the pylons have been constructed as the actual footprint of natural areas transformed by the project will not be of significant size.

#### **4.1.8 Urban Edge**

The project is not situated within the urban edge. The activity is mostly traversing farms/ rural communal areas to connect between the substation and the 132kV powerline which are outside the urban edge. The proposed line will help ensure that there is continuous power supply in the surrounding areas. The reliable electricity source would open the door to new economic opportunities, within the general area, in turn contributing to an increase in the local GDP. The powerline would ensure continuous and stable power supply in the area which would in turn stimulate growth, development and improve quality of life.

### **4.2 Human Environment**

#### **4.2.1 Socio-economic conditions**

Polokwane Municipality is located at the heart of Limpopo Province within Capricorn District Municipality. It is the vibrant capital of Limpopo, situated along the N1 north to Zimbabwe. It is the largest metropolitan complex in the north and a major economic centre. Polokwane Municipality is the provincial growth point which functions as a first order settlement. However, the geographical area of Polokwane Municipality is predominantly rural including considerable land under traditional authority. The municipality has 38 Wards

and a large portion of the population living in rural or peri-urban areas, which for most part is unplanned and poorly serviced.

#### 4.2.1.1 Population Growth

The population size is defined as the total number of households in a particular municipal area- this is vitally important when determining service provision requirement and infrastructural needs of local inhabitants. The growth rate of the population is of importance due to its ability to do future projections. These projections are used to determine future needs and indicate inward or outward migration, which in turn has an effect on job creation or availability and economic growth.

*Table 12: Population size and growth rate in Polokwane Municipality (Source: Global Insight, 2013)*

<u>Years</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
Population size	625,084	638,360	651,391	642,183
Population Growth rate	2.2%	2.1%	2.0%	1.5%

#### 4.2.1.2 Employment and unemployment

A total of 148 352 people were employed in Polokwane in the year 2012 when compared to 143 222 people in 2009. Global Insight research estimated the economically active population in Polokwane has slight increase over the years. This implies a labour force participation rate of has increased based on the proportion or percentage of the population of working age (i.e. 15 to 64 years) for 2012.

#### 4.2.1.3 Overall Implications for Polokwane Municipality (Growth and Development)

- Most developments are seen through property and infrastructure boom; this improves the lives of the majority of the Polokwane residents since the advent of democratic dispensation
- Inequality continues to remain high between population groups and within individual population groups. The Gini-coefficient based on disposable income (from work and social grants) for the whole country is high.
- Income inequality has not changed considerably between 2008 and 2012, in spite of economic growth in Polokwane's economy attained in 2011. This means that the quality of life, especially of the poor has not improved, but has more or less remained the same.
- The growth in population brings with it more responsibility on the part of government in terms of provision of services. The infrastructure (water, electricity, sanitation, health services, housing, educational and recreational facilities) should keep abreast with the growth in population. This should be done in partnership with the private sector.
- Economic growth in Polokwane was mostly driven by consumer expenditure and by the centralization of provincial public service functions from former homelands. These drivers appear to

have reached their full potential, meaning that the municipal economic growth rate has probably peaked and could weaken going forward. Accelerated economic growth and job creation will require new and innovative drivers of development.

#### 4.2.2 Heritage and Palaeontological conditions

During the site visit, three graves were observed on site (**Figure 17**), however they are not at risk of being impacted by the proposed developments. In terms of section 36 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), should archaeological sites or graves be exposed during construction activities, all work must be stopped in the immediate vicinity of the finds and it should immediately be reported to a heritage practitioner so that an investigation and evaluation of it can be made.



Figure 17: Graves observed on site

In terms of the current study area, according to the heritage specialist, no historical structure that is provisionally protected by Section 34 of the NHRA exists in the study area. The following features were recorded, an informal cemetery exists at coordinates S23° 54.289' E29° 37.747', It is probably linked to stone walled settlements. Other graves have been recorded just west of the present Aloe Substation at coordinates S23° 53.950' E29° 37.031'. The stone walled settlements recorded above will all contain obscured human burials. The graves are regarded as highly significant.

The locations of the proposed infrastructure development, namely, the substation and power lines will not directly impact on any heritage sites. A number of Late Iron Age and early historical period sites have been observed elsewhere in the buffer zone of the proposed project area. Some of the sites have previously been degraded by Eskom power lines; the most recent being the Tabor Witkop power line as well as the municipal water pipeline. These sites form a continuous cultural landscape in the Polokwane area that has not been adequately researched.

### **4.2.3 Visual and Aesthetics conditions**

Although located in a rural setting, the study area is not considered to have intact or outstanding rural landscape qualities. The receiving environment is not an area of important tourism or recreation value and has no protection status such as national parks, nature reserves, heritage reserves or scenic routes. The proposed substation, steel monopoles and communication tower are unlikely to provide visual intrusion to a landscape already dominated by existing powerlines of greater pylons. The vegetation surrounding the proposed substation site is likely to conceal the substation and the powerline.



## 5 ALTERNATIVES

In terms of the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended in 2017, feasible and reasonable alternatives must be identified and considered within the Basic Assessment process. According to the above-mentioned, an alternative is defined as “...in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- (a) property on which or location where it is proposed to undertake the activity;
  - (b) type of activity to be undertaken
  - (c) design or layout of the activity;
  - (d) technology to be used in the activity;
  - (e) operational aspects of the activity; and
- Includes the option of not implementing the activity.”*

The purpose of alternatives as defined in the Department of Environmental Affairs and Tourism’s (now Department of Environment, Forestry and Fisheries) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA, ‘*is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts.*’

In terms of Section 24 of NEMA, the proponent is required to demonstrate that alternatives have been described and investigated in sufficient detail during the BA process. It is important to highlight that alternatives must be practical, feasible, reasonable and viable to cater for an unbiased approach to the project and in turn to ensure environmental protection. The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and or through reducing or avoiding potentially significant negative impacts.

In order to ensure full disclosure of alternative activities, it is important that various role players contribute to their identification and evaluation. Stakeholders have an important contribution to make during the Basic assessment Process and each role is detailed as follows:

The role of the environmental practitioner is to:

- encourage the proponent to consider all feasible alternatives;

- provide opportunities for stakeholder input to the identification and evaluation of alternatives;
- document the process of identification and selection of alternatives;
- provide a comprehensive consideration of the impacts of each of the alternatives; and
- document the process of evaluation of alternatives.

The role of the proponent is to:

- assist in the identification of alternatives, particularly where these may be of a technical nature;
- disclose all information relevant to the identification and evaluation of alternatives;
- be open to the consideration of all reasonable alternatives; and
- be prepared for possible modifications to the project proposal before settling on a preferred option.

The role of the public is to:

- assist in the identification of alternatives, particularly where local knowledge is required;
- be open to the consideration of all reasonable alternatives; and
- recognise that there is rarely one favoured alternative that suits all stakeholders and that alternatives will be evaluated across a broad range of criteria, including environmental, social and economic aspects.

The applicability of each alternative type to the proposed project is outlined in **Table 13**. It must be highlighted that the alternatives presented in the table are derived from both the the EIA Regulations (2014) as amended as well as the Department of Environmental Affairs and Tourism's (now Department of Environment, Forestry and Fisheries) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA. Where the alternative is applicable to the project, it will be further discussed in this report.

*Table 13: Alternative types*

ALTERNATIVE	COMMENT
<b>No-go Option</b>	This alternative must be discussed on all projects as it allows for an assessment of impacts should the activity not be undertaken. Refer to <b>Alternative 5 in Chapter 5</b>
<b>Technology/Process alternatives</b>	These are also known as technological and equipment alternative. Eskom's technology has been selected based on its accuracy, efficiency and cost-effectiveness. Eskom prefers the proposed steel monopole structure as the technology to be used. Another technology considered is the installation of electric cables underground.
<b>Activity alternatives</b>	No alternatives were considered for the activity of constructing the substation and powerlines.

ALTERNATIVE	COMMENT
<b>Location/ property alternatives</b>	The location of the New Aloe Substation is based on an assessment by Eskom planners of a suitable area that will bring less impacts on the environment. This alternative is discussed in <b>Chapter 5</b>
<b>Demand alternatives</b>	<b>Not applicable</b> to the project
<b>Input alternatives</b>	<b>Not applicable</b> to the project but mainly to industries where input raw material and in turn outputs product are crucial to operations.
<b>Site layout alternatives</b>	Alternatives for the site footprint site layout have been provided as the different combinations of the site and route alternative were considered. This alternative is discussed in <b>Chapter 5</b> .
<b>Scale alternatives</b>	Scale alternatives for the project will not be applicable as only one outcome is required which is the development of a single substation with loop in and loop out lines. Additional area to be cleared will include vehicle turning point, working area and the proposed access road.
<b>Operational Alternatives</b>	These alternatives are not applicable for this project as no activities will be undertaken on site during the operational phase, except for maintenance on a regular basis or as and when required.

## 5.1 Site Location Alternatives

The two site location alternatives for the Aloe Substation have been proposed by Eskom. Each of the alternatives have also been assessed by various specialists to outline the environmental implications that both locations have. In this section, the two alternatives will be analyzed according to the field assessments that were undertaken by the specialists, advantages and disadvantages for each alternative will be described and the preferred option, that poses less risks or impact to the environment will be highlighted

### 5.1.1 Aloe Substation (Purple, Preferred option)

This alternative is located in a degraded area that consists of rubble, footpaths and informal tracks. According to the Terrestrial Biodiversity studies undertaken, the proposed substation is situated within the modified bushveld habitat. The habitat unit mainly comprises of areas that have been historically cultivated, with site interviews indicating crops to have included tomatoes, cabbage, peanuts, maize, onions and garlic (Pretorius, 2020). As indicated In **Figure 18**, Direct, ongoing impacts on this habitat unit include dumping of waste material adjacent to internal access roads and subsistence harvesting of trees. The ground is flat and suitable for the construction of the 132kV substation.

According to the geotechnical investigation, the proposed substation is underlain by shallow (and sometime outcropping) weathered granite. In terms of the drilling activities, it is recommended that

the foundations of the substation structure can be placed at shallow nominal depth (+/- 0.3 mbgl) on weathered granite bedrock (Welland, 2020). A number of impacts typically associated with the installation of the substation were identified by specialists. The main impacts center on clearing of vegetation and proliferation of alien species during all phases. Other minor impacts include possible sedimentation and contamination of the Diep River during the construction phase as well as the However, the current layout is located far from any wetlands or significant landscape features. Therefore, all anticipated risks to wetlands associated with the installation of the proposed 132kV substation are deemed to be of low significance. Based on the historical cultivations and loss of vegetation due to site clearance, the first alternative is the preferred option, as the site allows for construction activities to take place.

### 5.1.2 Aloe Substation (Yellow, alternative option)

The second site that is proposed by Eskom for the installation of the 132kV substation is also characterized by dumping of waste, footpaths, animal carcass and the vegetation is denser. There are existing 11kV powerlines and there is also a water pipeline that transects the area. This proposed location is situated within the prominent granite outcrop in the northern portion of the project area. The floral species composition of the granite outcrops differs from that of the surrounding Bushveld and Modified Bushveld habitat units, with a higher floral species diversity present. These landforms, act as refugia for certain species and hosts a variety of microclimates, which contributes toward increased biodiversity (Masehela et al., 2017). The occurrence of the protected tree species, *Sclerocarya birrea* subsp. *caffra* was also recorded within this habitat unit, by the terrestrial specialists. If there should be any construction or operational activities to occur in the Granite Outcrop habitat units, necessary permits will be required for the protected tree species in terms of the National Forests Act (Act No. 84 of 1998). However, in other circumstances, it is therefore imperative that the project infrastructure and construction-related disturbances do not extend to the above-mentioned habitat.

In terms of the geotechnical investigations, the proposed location of the substation is underlain by hardpan calcrete underlain by weathered granite (Welland, 2020). The foundations of the substation structure can be placed at shallow nominal depth (+/- 0.3 mbgl) at hardpan calcrete. There does not appear to be a preference (in terms of geotechnical conditions) between the southern and northern alternative positions for the substation. However, the laboratory test results reveal the higher resistivity of the granite which may be preferential for the grounding effectiveness (Welland, 2020). In terms of impacts on any wetlands or watercourses, this proposed location is not located close to any watercourse or significant landscape feature.

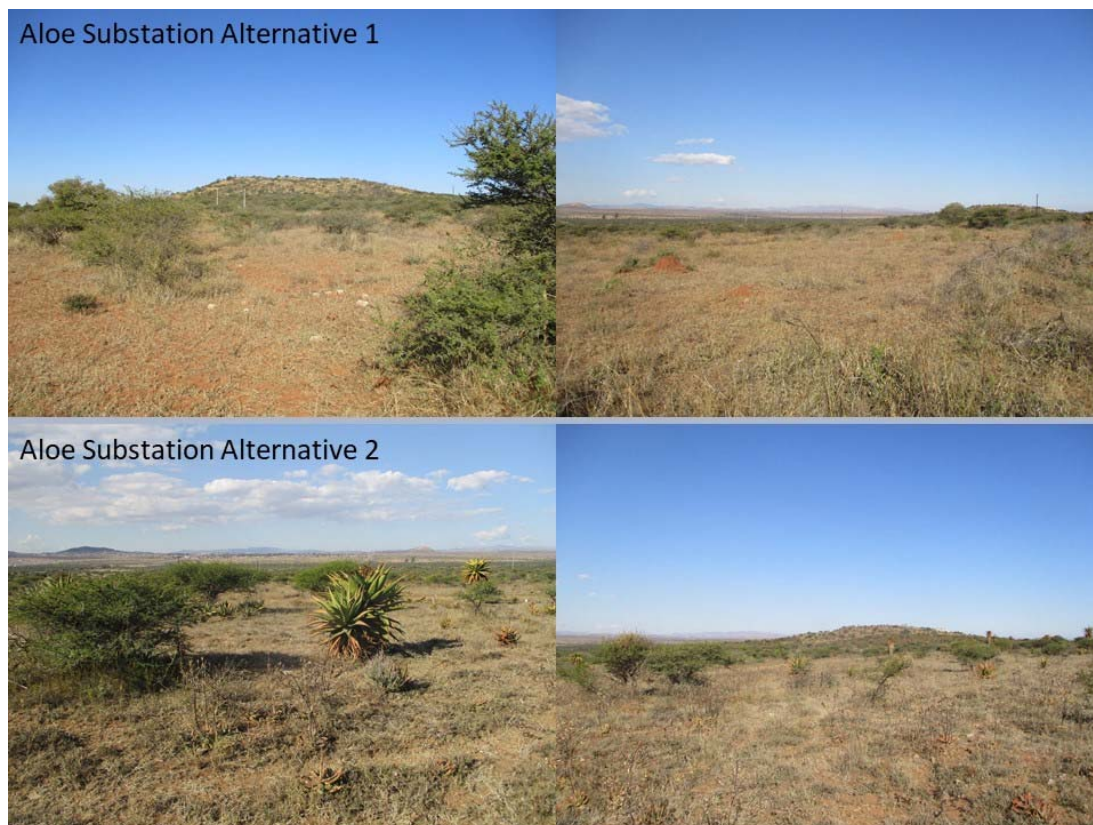


Figure 18: Representative photographs of habitat conditions within the Aloe Substation Alternative 1 and 2 development footprint areas

The table below provides a comparison of the proposed alternatives mentioned above:

Table 14: Brief comparative assessment of the project alternatives

Alternative 1 (Preferred)	Alternative 2
<ul style="list-style-type: none"> <li>• 2 hectares = 2000 m<sup>2</sup></li> <li>• Ground cover</li> <li>• Cultivated land</li> <li>• CBA1</li> <li>• Historical site clearance</li> <li>• No presence of protected trees species</li> </ul>	<ul style="list-style-type: none"> <li>• 2 hectares = 2000 m<sup>2</sup></li> <li>• Remaining extent of Polokwane Plateau Bushveld</li> <li>• Grassland and Woodland/ Open Bush</li> <li>• CBA1</li> <li>• No historical site clearance</li> <li>• Presence of protected trees species</li> </ul>

Based on the observations mentioned above and the results obtained from the specialist’s reports, the preferred location alternative for the 132-kV aloe substation is the site located north of the Lepelle pipeline (**yellow** alternative) due to this location having been impacted in the past by cultivation activities. However, it is also important to highlight that the alternative substation site (**purple**) does not pose any adverse risk, when proper mitigations for construction and operational activities are in

place. In terms of the avifaunal assessments, a shorter length of power line is likely to reduce the potential collision impact as well as the indirect displacement impact associated with habitat loss and disturbance. The location of alternative substation site in relation to the existing power line network, in addition to the open nature of the habitat makes this option preferable, negating the need for a slightly longer Loop-in Loop-out power line.

This study therefore recommends that the preferred substation site is alternative 1. This assessment is not strictly conducted on the conventional impact assessment process but integrates strengths of environmental planning from the inception phase to ensure that sensitive environmental features are excluded from development, and that environmental opportunities and constraints are integrated into the planning and design of the scheme.

## **5.2 Design Alternatives**

Design alternatives are the consideration of different designs for technical efficiency, aesthetic purposes or different construction materials in an attempt to optimise local benefits and sustainability. The following design alternatives were considered for the project.

### **5.2.1 Proposed Steel Monopole Structure vs Lattice structures**

Eskom prefers the proposed steel monopole structure as the technology to be used. A steel monopole structure is considered as the most appropriate technology, and in some cases has been specifically designed for the existing environmental conditions and terrain, as specified by standard ESKOM specifications and best international practice. These monopole structures have already been used in the surrounding powerlines and do not seem to have caused significant environmental impacts.

Monopole structures are considered to be cost effective and preferable in any areas with denser population. When compared to underground cables and other overhead structures, the speed and ease of installation of monopoles is significantly better, the impact on land is less, and the economic decisions associated with easier installations and little post-installation maintenance result in low life-cycle costs. The use of monopole structures also allows much more flexibility with respect to width of right-of-way and height requirements for structures.

The impact on the land is much less for monopole structures in comparison to other structures. In addition, the time required on the landowner's property is less for steel for monopole structures. The

reduced time on the land reduces the impact on the landowner's use of his land and allows him to get back sooner to his normal operations. Lastly, the footprint required for steel monopole structures is much less when compared to other structures. The reduced footprint can require less right-of way, easier operation on the ground during construction, and allow for more natural uses of land after construction. These tower structures proposed have been selected to reduce visual impacts, impact on sensitive vegetation areas, wetlands and sensitive riparian habitats.

With regards to the issue of lattice vs. monopole, Eskom generally utilises monopole structures as it is aesthetically more pleasing, has a smaller footprint and requires less steel. Monopole structures are not self-supporting hence it needs stays to hold up the strain structures whereas lattice can be self-supporting.

### **5.2.2 Proposed Overhead Powerline vs. Underground Cable**

The alternative entails the installation of electric cables underground rather than overhead on poles and towers. The major environmental impacts of overhead lines occur when they are already in operation. They are mainly related to birds colliding with the lines as well as the visible effects on the landscape. Whereas the most harmful part of underground cables, in contrast, is their installation.

However, underground cabling is more expensive, since the cost of burying cables at transmission voltages is several times greater than overhead power lines, and the life-cycle cost of an underground power cable is two to four times the cost of an overhead power line.

Whereas finding and repairing overhead wire breaks can be accomplished in hours, underground repairs can take days or weeks, and for this reason redundant lines are run. Furthermore, underground power cables, due to their proximity to earth, cannot be maintained live, whereas overhead power cables can be. Operations are more difficult since the high reactive power of underground cables produces large charging currents and so makes voltage control more difficult. The shunt capacitance is greater with underground cables than it is with overhead, and at the same time, the series reactance is lower. That's a consequence of the spatial physics. As a result, the use of underground cables for transmission can result in significant reactive control problems at the transmission level. That in turn means that additional equipment is required to address those reactive control problems, further increasing the effective cost of underground compared with overhead.

Laying an underground cable will affect the rights of the owners and occupants of the land on which the power line is built and used, to a degree similar to the erection of an overhead line. In principle, easements rights of use are recorded in the land register. The owners receive appropriate compensation. This ensures that the transmission system operator can build the power line and subsequently access it in order to carry out the necessary maintenance and repair works. In the case of underground cable, continual and direct access for maintenance and repairs is only guaranteed when the area above the cable remains free. As a consequence, use of the underground cable route for agricultural purposes is not possible or is subject to restrictions.

Underground cables also cause negative ecological impacts. When burying cables, the soil must be exchanged. Furthermore, not only do the cable routes need to be kept free from deeply rooted plants, they may not be built on for any other purpose. In addition, underground cables radiate heat. This has an effect on soil humidity, which, for example, can lead to drainage or drying out of marshes.

**Underground cabling is not feasible over long distances particularly in rural settings and makes little economic sense. For the reasons highlighted above, this alternative has not been assessed further for this application.**



### 5.3 Routing Alternatives

Consideration of alternative routes generally applies to linear developments such as power lines, transport and pipeline routes. In route investigations, various corridors are investigated and compared in terms of their impacts.

#### 5.3.1 Silica Aloe Loop-in (green) and Thabamoopo Loop out (red) Proposed Route

The Preferred loop in and loop out powerline route which comprised of two distribution lines that run parallel to each another. The preferred route originates from the proposed substations and runs for 2.2 km in a southerly direction towards the existing Silica Thaba North 132kV powerline. The 1 km corridors overlap the 500m regulated area along the identified Diep River. This triggered the need for a wetland and riparian baseline and risk assessment.

This route passes through communal farmland and crosses the access road once and an existing transmission line. Eskom will need to acquire 36m wide servitude to be utilized up to the proposed Aloe substation.

#### 5.3.2 Silica Aloe Loop-in (orange) and Thabamoopo Loop out (red) Alternative Route 1

This Route Alternative starts at the same substations but takes a south-south-west trajectory (as opposed to the southerly trajectory of the preferred powerline route). The route will take the longest alignment from the proposed substation to the existing Silica Thaba North 132kV powerline. This route avoids the existing gravel road and crosses the River. Like with the Preferred Alternative, a 1 km radial project area buffer was assigned to Route Alternative 1. Route Alternative 1 traverses the Granite outcrop habitat unit, as well as the Diep River riparian area and at least three non-perennial watercourses. A higher level of mitigation will therefore be required to manage ecological impacts should this alternative be implemented.

### 5.4 Site Layout Alternatives

Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include particular components of a proposed development or may include the entire activity (Glasson et al., 1999). The proposed development will consist of a combination of a footprint (substation) and a linear (loop in and loop out powerline) footprint. To adequately assess the possible combination of the proposed infrastructure against the different locations and process

technologies, site layout alternatives were developed and assessed. The layouts considered are as follows.

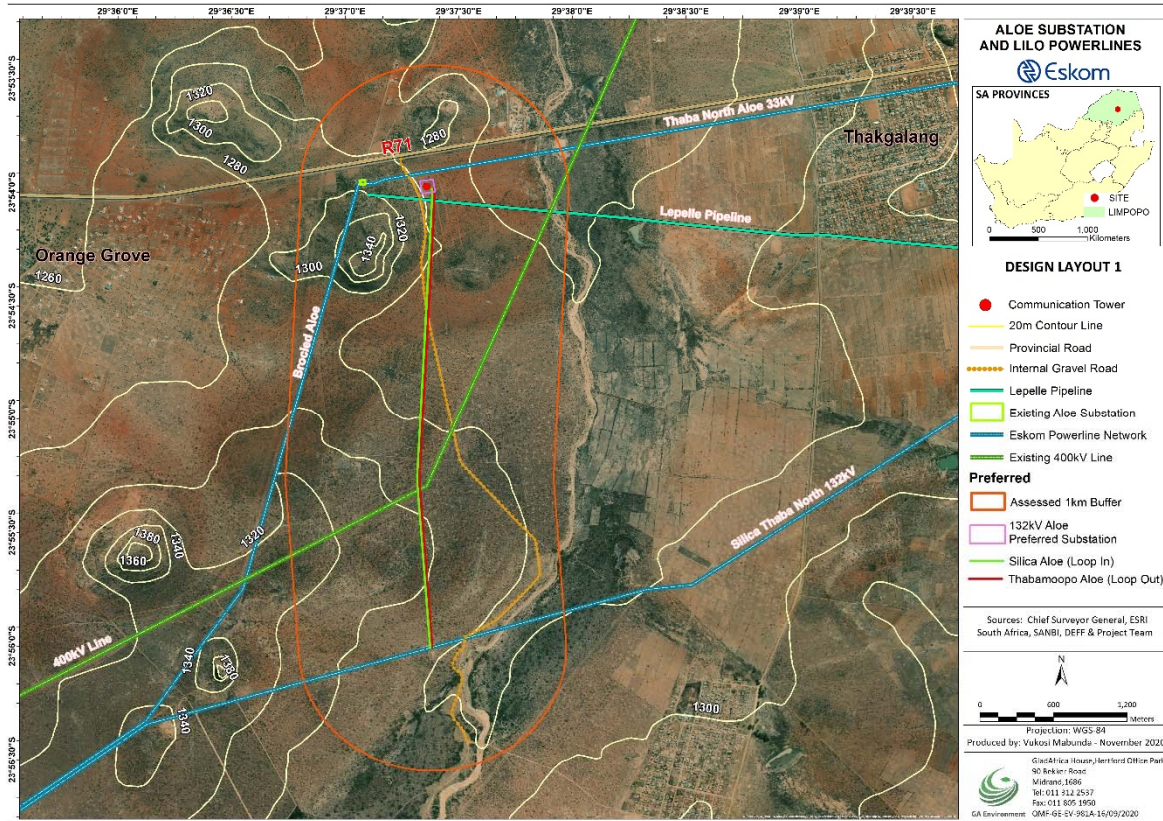


Figure 19: Layout Alternative 1 (Preferred)

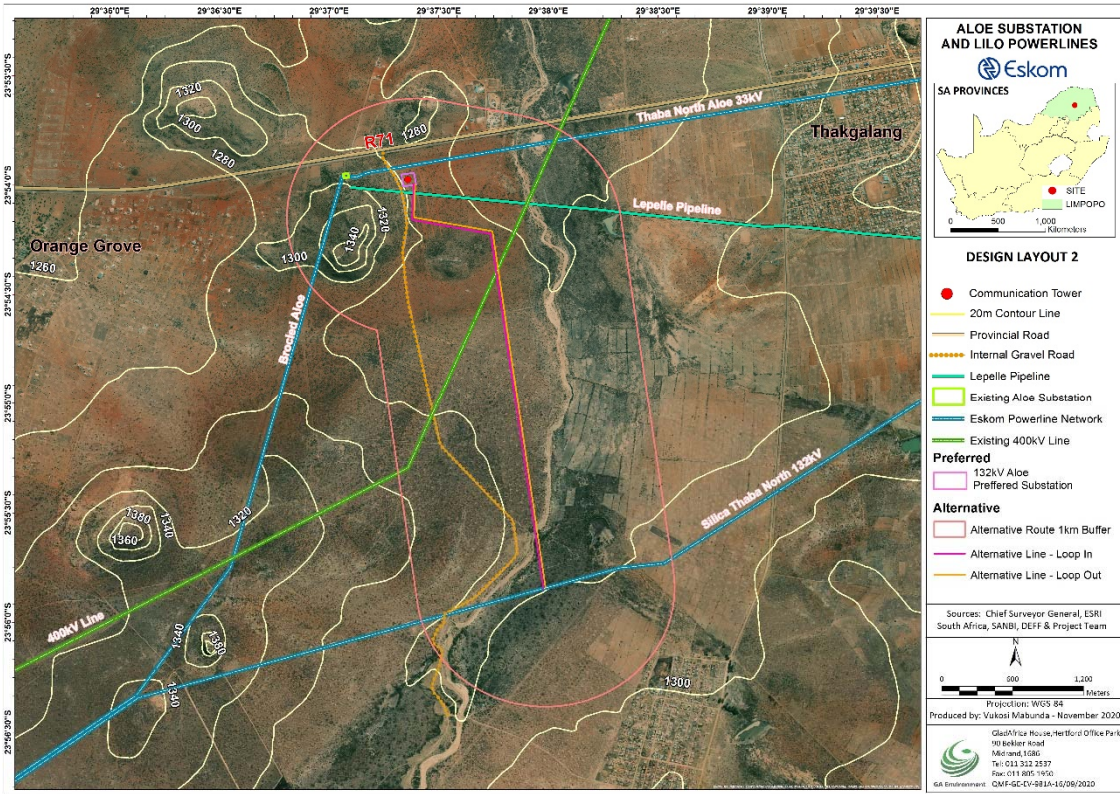


Figure 20: Layout Alternative 2

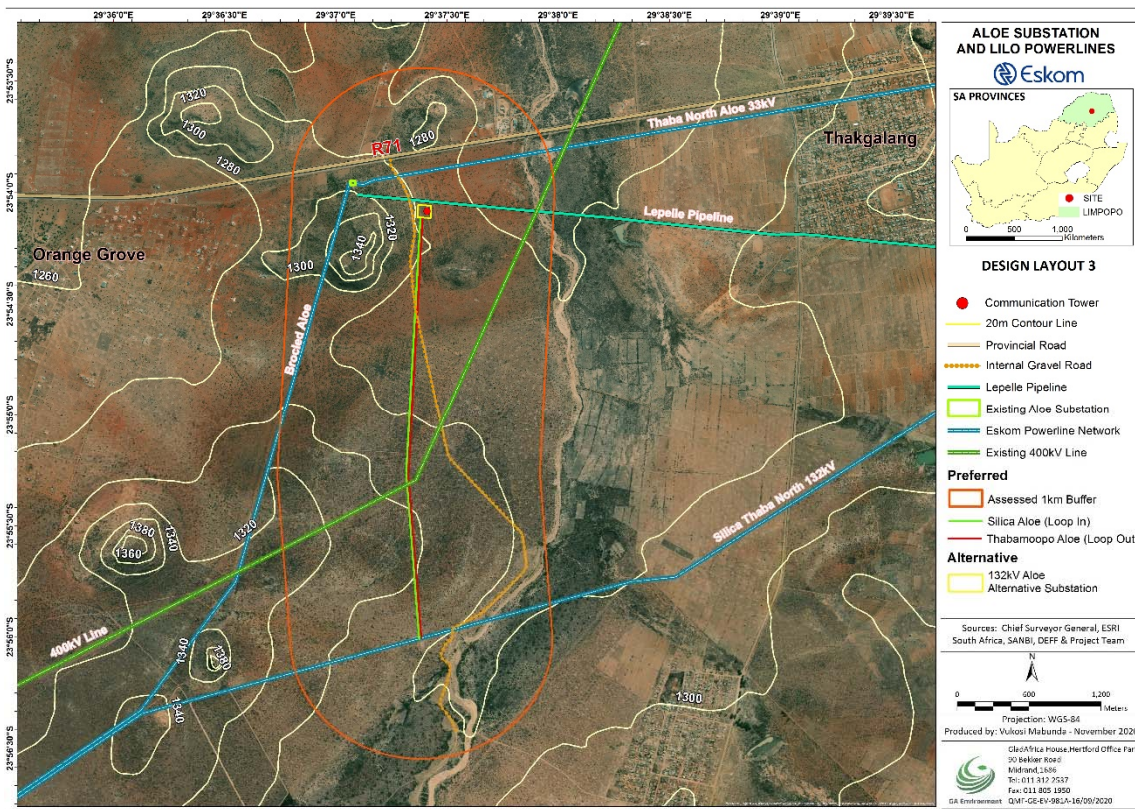


Figure 21: Layout Alternative 3

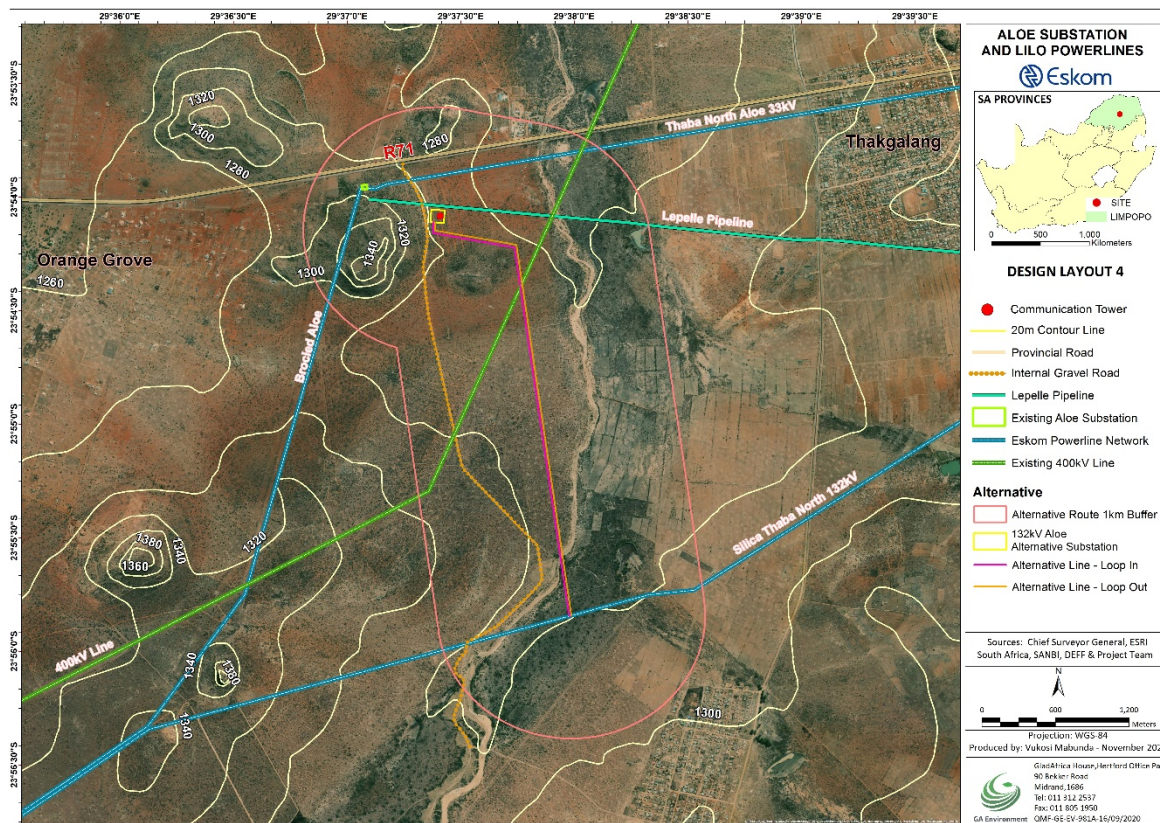


Figure 22: Layout Alternative 4

Design layout Alternative 1 is the preferred layout as it combines the substation site located north of the Lepelle pipeline with preferred Silica Aloe Loop-in (green) and Thabamooop Loop out (red) Proposed Route. The use of single circuit overhead power lines to distribute electricity is considered the most appropriate technology. The preferred route consists of the shortest alignment and is combined with the location of a substation located in the most significantly disturbed area. From a Technical aspect, this option is considered appropriate for the following reasons:

- Lower installation and maintenance costs compared to alternative layout alternatives;
- This layout alternative avoids the crossing of the river and connects to the existing Silica Thaba North 132kV powerline at the required angle; and
- This design layout avoids crossing the existing 400kV powerline at an unfeasible angle.

## 5.5 No go Alternative

The No-go option implies that the Project does not proceed and will thus comprise of Eskom not going ahead with the construction of the proposed power lines and substations. Ideally this would be the preferred alternative as the status quo of the environment remains unchanged, however due to the growing demand for energy and activities that will require electricity in the area, this alternative is not feasible. Should Eskom rely on the existing network to supply future demand it is highly likely that present supply will be compromised due to the increased load on the network. Although the no-go

alternative has been considered, it is not a practical project alternative in terms of providing stable electricity supply in the area as it implies a continuation of the current situation or the status quo, therefore, it doesn't render any positive outcomes.

Eskom Grid Planning is responsible for establishing future electricity demands as a result of growth and development. Once an area has been identified where future growth will result in electricity constraints, methods for strengthening the grid to sustain future growth patterns is considered. The current supply is not sufficient to carry the requisite load and as such the New Aloe substation and the Loop-In Loop-Out power lines will ensure a stable and efficient electricity supply for the future. After Eskom Grid Planning has identified the selected method to strengthen the grid, the proposed power line which will be required for this project was identified. This project is required to strengthen the grid in order to ensure stable electricity supply. Without the proposed power line, the power outages will continue, the Strengthening Scheme project cannot take place and the grid can therefore not be strengthened.

If this project is not implemented, it will negatively impact the future electricity supply of the area. Eskom will not be able to meet the current capacity demand of the region. That will subsequently affect the economic growth of the country at large. Ultimately, the project will improve the performance of the supply to the region, in turn contributing to a greater availability of electricity to residents and industry in the area. By not increasing the supply to the greater area, development will be constrained.

## 6 PUBLIC PARTICIPATION PROCESS

The NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Basic Assessment process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations. The purpose of the Public Participation Process is to provide all potential and / or registered Interested and Affected Parties (I&APs hereafter), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Basic Assessment process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Basic Assessment process.

On the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to NEMA Permits and Licenses. The Draft BAR has been submitted as per these Directions which provide the process to be followed in undertaking public participation while ensuring that the EAPs actions curtail the threat posed by the Covid-19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster.

This chapter of the report provides details on the Public Participation Process followed during the Basic Assessment process for the New Aloe Substation and LILO Powerlines.

### 6.1 Stakeholder Pre-Consultation

In order to address the requirements of public participation in accordance with **Chapter 6** of the EIA Regulations and the Public Participation Guideline as contemplated in section 24J of the NEMA, GA Environment started to undertake an exercise of identifying key stakeholders.

The project area is located close to farmlands that were observed during the site visit. GA Environment has consulted the landowners located within a kilometre of the substation. Adjacent landowners were identified through GIS cadastral data. Search works, a web-based search application was used to confirm property owner details of which contact information for farms located in excess of 5km away from the substation could not be obtained. Further efforts were made to obtain the contact details of other respective landowners located further away through consultation with the ward councillor. Upon receipt of verifiable contact details, each adjacent landowner was formally notified as per Regulation 41 (1)(ii) of the EIA Regulations. Refer to the Interested and Affected Parties Register in **Appendix E6**.

## 6.2 Identification of Interested and Affected Parties

Interested and Affected Parties (I&APs) were identified and notified through various means of online tools. An advert has been placed in the Polokwane Review to notify I&APs about the development. Other activities that will be part of the initial public participation phase include the placement of Site Notices, the distribution of Notification Letters as electronic versions by e-mail.

## 6.3 Notification Letters

Regulation 41(2)(b) of the NEMA (1998) EIA Regulations, 2014, as amended requires that written notification be given to various parties who include the following:

- (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- (iv) the municipality which has jurisdiction in the area;*
- (v) any organ of state having jurisdiction in respect of any aspect of the activity;*
- and*
- (vi) any other party as required by the competent authority;*

Hardcopy versions of the Notification Letters were compiled and distributed to all I&APs. The document provided a background on the proposed development and information on how one can register as an I&AP on the project in order to be able to be kept abreast of all developments related to the project. A copy of the Notification Letter is attached as **Appendix E3**.

**E-mail notifications and telephone calls were utilised to notify all registered I&AP's about the availability of the report and submission of comments in line with the Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to NEMA Permits and Licenses issued on 5 June 2020.**

#### 6.4 Newspaper Advertisement

Regulation 41(2)(c) and (d) of the NEMA (1998) EIA Regulations, 2014, as amended requires that PPP includes the placement of a Newspaper Advertisement to notify all potential I&AP's about the proposed project and to invite them to register as I&AP's and provide comments on the project. An advertisement was published in the Polokwane Review, on the week ending 11<sup>th</sup> of August 2020. The proof of the placement of the Newspaper Advertisement is attached as **Appendix E2**.

#### 6.5 Notice Boards/Site Notices

In accordance with Regulation 41(4)(a) of the NEMA (1998) EIA Regulations, 2014, as amended, notice boards of 60cm X 42cm (i.e. A2 Sizes) were prepared and placed on various locations in and around the site in conspicuous places. Proof of site notice is attached as **Appendix E4**.

#### 6.6 Availability of Draft Basic Assessment Report for review

The Draft Basic Assessment Report will be made available to the following Organs of State:

- Department of Environment, Forestry and Fisheries (DEFF)
- Department of Agriculture, Land Reform and Rural Development (DALRRD)
- South African Civil Aviation Authority
- Polokwane Local Municipality
- South African Heritage Resources Information System (SAHRIS)
- Limpopo Department: Economic Development, Environment and Tourism Limpopo Heritage Resources Authority (LEDET)
- Department of Water and Sanitation (DWS)
- Mothiba Tribal Authority

Proof of submission will be provided in the Final Basic Assessment Report. The above mentioned I&Ps will be informed of the directions issued by DEFF and a link whereby the report and Appendices can be downloaded. GA Environment will also provide telephonic updates with the respective I&APs to confirm receipt of the report. All registered I&APs will also be provided with the link to download an electronic copy of the Draft Basic Assessment Report.

#### 6.7 I&AP's Register and Comments & Response Report

During the Initial Assessment that was undertaken between April 2019 and November 2019, a register for Interested and affected persons, organizations and organs of state identified was opened. As part



of the Basic Assessment phase of the project, the register remains open for the duration of the BA process and is constantly maintained. All comments that were received from registered I&APs will be acknowledged and accompanied by a response addressed in an objective manner. The Comments and responses must be recorded in the comments and response report that is submitted with the Final BAR. The I&APs Register is attached in **Appendix E6**.

## **6.8 Focus Group Meetings**

The need for a public open day or focus group meeting for this development will arise after receiving comments from the interested and affected parties. The option of an online meeting will also be provided to the I&AP's. GA Environment will respond to all comments received from I&APs and the updated comments and the response report will be made available in the Final Basic Assessment Report. However, should the comments received on the proposed project warrant the need for a public open day, then the Disaster Management Act requirements prescribed at a time of undertaking this activity will be applied. The open day will be broken up into various sessions which will limit the number of I&APs to each session.

## 7 IMPACT ASSESSMENT METHODOLOGY

The main objective of this section is to provide independent and scientifically sound information on the impacts identified during the BA. Based on the requirements of the impact assessment, impacts identified, and issues and concerns raised are assessed with regard to their significance. The impact assessment is aimed at determining the impacts associated with the proposed development and the prescription of mitigation measures. Other impacts associated with the proposed development are discussed in detail in this section. The significance of the potential impacts is described in terms of their *nature, extent, duration, intensity* and *probability*.

In this report, impacts with a low significance are considered to have no influence on the decision to proceed with the proposed development. Impacts with a moderate significance will influence the decision, unless they can be effectively mitigated to a low significance, whereas impacts with a high significance - despite mitigation - would influence the decision to proceed with the proposed development.

### 7.1 Impact Mitigation Hierarchy

The Impact Mitigation Hierarchy provides steps that must be used in mitigating adverse impacts of a project and in turn ensuring environmental protection. There are various levels of preference for mitigation options with the most preferred method and the first step as avoidance and the least and final method as offset. Refer to **Figure 23** for an illustration of the Mitigation Hierarchy

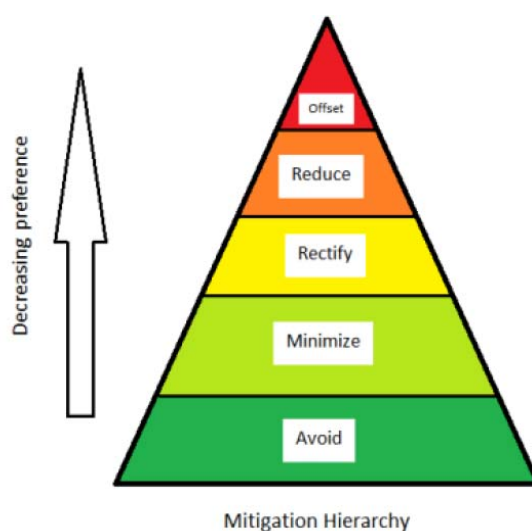


Figure 23: Mitigation hierarchy showing levels of preference (Eco Intelligent, 2016)

Each of the mitigation types will be discussed and contextualised to the proposed construction of the substation and powerlines.

**Step 1: Avoidance-** Although this is the most preferred form of mitigation on projects to avoid adverse environmental impacts as it will not result in the construction of the proposed activities, this is not suitable solution to the strengthening of the electricity grid and improving electricity distribution.

**Step 2: Minimisation-** This entails the reduction of adverse environmental impacts through various means as it based on the recognition that environmental impacts cannot be fully avoided in the proposed activity. The minimisation of adverse impacts will be adopted for the construction of the substation and powerline. The Mitigation measures proposed are discussed in **Chapter 8** of this report as well as in the Environmental Management Programme attached as **Appendix H1**.

**Step 3: Rectification-** Where an impact has already taken place, rectification entails the implementation of corrective measures to avoid further adverse environmental impacts. Rectification will apply in cases where Contractors or maintenance employees may have erroneously undertaken construction activities outside the existing Substation or when the proposed mitigation measures are not adhered to or unforeseen impacts arise.

**Step 4: Reduction-** This is applicable where the above-mentioned rectification is not possible. Rectification requires new management practices and/or changes in methodology to ensure environmental protection.

**Step 5: Environmental Offset-** This is meant to cater for the effects of the development through compensation of biodiversity losses by measures such as the establishment of new plants where it is not possible to avoid the clearance of vegetation or rehabilitate the disturbed areas.

## 7.2 Impact Assessment Methodology

In accordance with Government Notice R. 982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), the EAP is required to assess the significance of potential impacts in terms of the following criteria:

- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- Probability of the impact occurring;

- Reversibility of impacts; and
- Impact on irreplaceable resources; and
- Cumulative impacts.

Activities within the framework of the proposed development and their respective construction, operation, decommission and rehabilitation phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

**Construction phase:**

This phase refers to all the construction related activities on site during installation of the proposed new Aloe substation and LILO powerlines infrastructure, until the contractor leaves the site.

**Operation phase:**

This phase refers to the period in which the New Aloe Substation will be operated in support of the National Grid.

**Decommissioning and Rehabilitation phase:**

This includes all activities associated with the closure and decommissioning of the proposed development, should there be a need to remove the proposed development and rehabilitation that may need to occur. This includes all activities undertaken to ensure that the environmental integrity of the site is maintained and preserved after Rehabilitation has taken place.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure. The methodology that will be used comprises of the following four steps:

- Step 1: Identification of positive and negative impacts of the project;
- Step 2: Identification of the significance rating of the impact before mitigation;
- Step 3: Identification of the mitigation measure and the mitigation efficiency; and
- Step 4: Identification of the significance rating of the impact after mitigation.

Activities that will be undertaken to give effect to the proposed development gives rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into the following phases discussed in **Table 15**.

*Table 15: Project phases in a development*

<b>PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR</b>	
<b>Status Quo</b>	
	The study area as it currently exists.
<b>Preconstruction phase</b>	
	All activities undertaken before construction phase including planning, specialist studies and assessments. All activities on site up to the start of construction, not including the transport of materials, but including the initial site preparations. This also includes the impacts that would be associated with planning.
<b>Construction phase</b>	
	All Activities during the construction of the New Aloe substation and LILO Powerlines, infrastructure including the delivery of materials
<b>Operation phase</b>	
	All activities post construction including the operation and maintenance of the proposed infrastructure.
<b>Decommissioning and Rehabilitation phase (post-closure phase)</b>	
	All activities undertaken to ensure the maintenance or removal of Substation equipment or powerline infrastructure at the end of their life cycle and the site is restored to its original state as humanely possible.
	The activities arising from each of the relevant phases have been included in the impact assessment tables. The assessment endeavours to identify activities that would require environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

### **7.2.1 Assessment**

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations (2006) and integrated environmental management series published by the Department of Environmental Affairs and Tourism (DEAT) currently Department of Environment, Forestry and Fisheries (DEFF). In addition to this, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations as amended, Appendices 1 and 2 that an

Impact and Risk Assessment process be undertaken for the Basic Assessments and Environmental Impact Reporting. The Assessment Criteria is based on the following:

- Nature of impact;
- Extent;
- Duration;
- Intensity;
- Probability;
- Determination of significance; and
- Reversibility of impact.

Each of these are explained in **Table 16** below.

*Table 16: Assessment Criteria*

<b>ASSESSMENT CRITERIA</b>	
<b>i). Nature of Impact</b>	
	This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, and how.
<b>b) Extent</b>	
	The physical and spatial size of the impact. This is classified as: <ul style="list-style-type: none"> <li><b>i) Site</b> The impact could affect the whole, or a measurable portion of the site.</li> <li><b>ii) Local</b> The impacted area extends only as far as the activity, e.g. a footprint of the specific activity</li> <li><b>iii) Regional</b> The impact could affect areas such as neighbouring farms, transport corridors and the adjoining towns.</li> </ul>

<b>c) Duration</b>	
	The lifetime of the impact; this is measured in the context of the lifetime of the proposed project. <ul style="list-style-type: none"> <li><b>i) Short term</b> The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases.</li> </ul>

<b>c) Duration</b>
<p><b>ii) Medium term</b></p> <p>The impact will last up to the end of the phases, thereafter it will be entirely negated.</p>
<p><b>iii) Long term</b></p> <p>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.</p>
<p><b>iv) Permanent</b></p> <p>The only class of impact which will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.</p>

<b>d) Intensity</b>
<p>Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as:</p>
<p><b>i) Low</b></p> <p>The impact alters the affected environment in such a way that the natural processes or functions are not affected.</p>
<p><b>ii) Medium (Moderate)</b></p> <p>The affected environment is altered, but function and process continue, albeit in a modified way.</p>
<p><b>iii) High</b></p> <p>Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.</p>
<b>e) Probability</b>
<p>This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:</p>
<p><b>i) Improbable</b></p> <p>The possibility of the impact occurring is very low, due either to the circumstances, design or experience.</p>
<p><b>ii) Probable</b></p> <p>There is a possibility that the impact will occur to the extent that provisions must be made.</p>
<p><b>iii) Highly probable</b></p>

It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.

**iv) Definite**

The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.

**f) Reversibility of impact**

Natural or human aided intervention:

**(i) Irreversible**

The impact will be permanent.

**(ii) Short term**

The impact is reversible within two years after construction.

**(iii) Long term**

The impact is reversible within 2 to 10 years after construction.

**g) The degree to which the impact can cause irreplaceable loss of resources**

**(i) Low**

The impact results in the loss of resources but the natural, cultural and social processes/functions are not affected.

**(ii) Medium**

The loss of resources occurs but natural cultural and social processes continue, albeit in a modified manner.

**(iii) High**

The impact results in irreplaceable loss of resource.

**h) Significance of impact with or without mitigation**

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 classes are rated as follows:

**i) No significance**

The impact is not substantial and does not require any mitigation.

**ii) Low**

The impact is of little importance but may require limited mitigation.

**iii) Medium (Moderate)**

The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.



**iv) High**

The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable.

In order to maintain consistency, all potential impacts that have been identified during the BA process will be listed in impact assessment tables. The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance of impacts will be determined by considering consequence and probability.

## 8 DESCRIPTION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS

A Basic Assessment Report (BAR) must contain all the information that is necessary for a good understanding of the nature of issues identified during the Basic Assessment (BA) process. The BAR must include a description of environmental issues and potential impacts, including cumulative impacts, mitigation measures that have been identified and other aspects as outlined in Appendix 4 of the NEMA EIA Regulations, 2014 as amended. This chapter also describes the environmental issues and impacts as identified during the BA Process for the Aloe Substation and LILO powerlines. The proposed mitigation measures are discussed in this Chapter as well as in the EMPr attached as **Appendix H1** of this report.

The main objective of this section is to provide independent and scientifically sound information on the impacts identified during the Basic Assessment (BA) Process. Based on the requirements of the impact assessment, impacts identified, and issues and concerns raised are assessed with regard to their significance. The impact assessment is aimed at determining the impacts associated with the proposed development and the prescription of mitigation measures. Other impacts associated with the proposed development are discussed in detail in this section. It must be highlighted that the Impact Assessment Methodology discussed in **Chapter 7** of this report was used to assess the identified impacts in terms of:

- nature, significance and consequences of the impact and risk;
- extent and duration of the impact and risk;
- probability of the impact and risk occurring;
- the degree to which the impact and risk can be reversed;
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be avoided, managed or mitigated.

The cumulative impacts of the project will also be discussed.

In this report, impacts with a *low significance* are considered to have no influence on the decision to proceed with the proposed development. Impacts with a *moderate significance* will influence the decision unless they can be effectively mitigated to a low significance, whereas impacts with a *high significance* despite mitigation would influence the decision to proceed with the proposed development. The impacts discussed in this section were identified by the Project Team (including specialists) and were augmented by input from the I&APs during the various project phases. The potential impacts identified and elaborated on in this chapter have been presented as follows:

- Theme 1: Impacts on the Biophysical Environment; and
- Theme 2: Impacts on the Socio-Economic Environment.

For the purposes of this assessment, this impact assessment will **only** focus on the impacts that are likely to occur during the construction and operational phases of the site based on the layout alternatives which factor the location of the substation and the route alternative aligned to be considered. Layout Alternative 1, 2, 3 and 4 have been assessed and for this reason.

## **8.1 Theme 1: Impacts on the Biophysical Environment**

### **8.1.1 Impacts on loss of floral species of Conservation Concern and habitats**

Loss of floral species of Conservation Concern may take place during the construction and operational phases of the project as a result of the project activities outlined below:

#### Construction Phase

- Clearing of vegetation and preparing surface areas for construction.
- Encroachment of construction activities beyond the extent of the proposed project development footprint, leading to loss of habitat within areas of increased ecological sensitivity.
- Movement of construction vehicles and access and maintenance road/ servitude construction beyond the project development footprint.
- Compaction of soils due to movement of construction vehicles.
- Disturbance to soils leading to erosion.
- Dumping of litter and construction or waste material outside of designated areas.
- Alien invasive species proliferation leading to loss of floral habitat in the surrounding areas.
- Uncontrolled fires during construction.
- Dust generation during construction.

#### Operational Phase

- Ongoing disturbances and compaction of soils due to general operational and maintenance activities.
- Ongoing disturbances and altered runoff patterns leading to erosion and sedimentation of watercourses.
- Ongoing proliferation of alien and invasive floral species that may outcompete indigenous floral species and degrade faunal habitat.
- Disturbance within the project area and surrounds due to increased human activity and operational vehicles.
- Altered community composition of areas immediately adjacent to the project are due to altered ecosystem processes.
- Failure to implement an invasive species management programme.

- Ineffective rehabilitation of exposed and impacted areas.

**Table 17** presents an assessment of the impacts associated with the loss of Floral Species of Conservation concern.

*Table 17: Assessment of impacts related to the loss of Floral Species of Conservation concern*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium	High	Medium Low
	Alt 2	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium	High	Medium Low
	Alt 3	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium	High	Medium Low
	Alt 4	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium	High	Medium Low
Operational	Alt 1	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 2	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 3	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 4	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low

The proposed mitigation measures to avoid adverse impacts arising as result of the loss of Floral Species of Conservation concern is as follows:

- The positioning of project infrastructure in relation to areas of increased ecological sensitivity should be considered during the pre-construction and planning phases of the project.
- Construction activities may not extend to the north of the R71 where high ecologically sensitive granite outcrop occur.
- No infrastructure may be placed within areas indicated to be of increased ecological sensitivity, namely the Granite Outcrop and Riparian and Freshwater Resources habitat units, and infrastructure may not impact on these areas. The Granite Outcrop habitat unit, due to the potential for floral SCC to occur here, must be managed as a strict No-Go area for construction workers and vehicles.
- Specific consideration should be given to the positioning of pylons within the Bushveld habitat unit in the south of the project area and pylons should be positioned as far apart as possible to limit clearance footprints.
- The maintenance corridor/ powerline servitude must not involve complete clearance or removal of vegetation, but rather be limited to cutting and trimming of vegetation only where necessary.
- The development and disturbance footprint areas for the new substation and pylons must be kept as small as possible.
- No areas should be cleared of natural vegetation if not required for construction and operational purposes, and development footprint areas should be kept as small and compact as possible. The loss of indigenous vegetation, particularly within the Bushveld habitat unit, should be limited where possible.

- Ecological connectivity within the project area should be considered and maintained to ensure faunal movement patterns are not restricted.
- Edge effects from construction and operational activities, such as erosion and alien floral species proliferation and the spread of these within disturbed areas, should be managed throughout all the development phases through the implementation of erosion control measures where required and the implementation of an alien and invasive species management programme.
- No natural areas on adjacent properties may be disturbed in any way and access roads towards the substation should follow existing roads and tracks and utilise existing access points as far as possible to prevent clearing of additional areas.
- Vehicle access beyond the designated project footprint areas should be prohibited.
- Construction camps, contractors' laydown areas and other temporary infrastructure are to be placed within areas that have already been modified.
- No littering or dumping of waste and construction material within natural areas beyond the project footprint areas may be allowed.
- Appropriate sanitation facilities must be provided for the duration of the proposed construction activities and all waste removed to an appropriate facility.
- No indiscriminate fires should be allowed within the construction area.
- Dust suppression measures must be implemented.
- Any fires made by construction workers, if unavoidable, should be restricted to designated areas, where accidental spread thereof can be avoided.
- Any disturbed and compacted areas outside of the project footprint areas must be ripped, reprofiled and revegetated with indigenous plant species naturally growing within the area.

Refer to the EMPr in **Appendix H1** and the Alien Invasive Management Plan in **Appendix H2** for additional mitigation measures.

### **8.1.2 Impacts on loss of Faunal Species**

Loss of faunal species will likely take place during the construction and operational phases of the project as a result of the project activities outlined below:

#### Construction Phase

- Clearing of vegetation during site establishment and preparing surface areas for construction within intact faunal habitats (the Granite Outcrop habitat unit).

- Construction of infrastructure and temporary infrastructure such as access roads and contractor's laydown areas through or within areas of increased ecological sensitivity.
- Encroachment of construction activities, and movement of construction vehicles beyond the extent of the proposed project development footprint, leading to loss of species diversity within areas of increased ecological sensitivity, such as the Granite Outcrop habitat unit.
- Movement of construction vehicles through sensitive faunal habitats.
- Accidental fires due to increased human activity.
- Increased human presence resulting in negative faunal interactions with humans (continued poaching, trapping and potential collection of faunal SCC as well as intentional killing of fauna (such as snakes)).

### Operational Phase

- Movement of operational vehicles through areas of increased ecological sensitivity known to provide habitat for faunal SCC and protected species beyond the project footprint area.
- Accidental fires due to increased human activity.
- Potential poaching/trapping of fauna.
- Disturbance beyond the project footprint areas, leading to loss of habitat quality and increase in suboptimal habitat.

The impact assessment for the impacts on loss of faunal species diversity and SCC mentioned above is shown in **Table 18**.

*Table 18: Assessment of impacts related to the loss of Faunal Species*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 2	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 3	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 4	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
Operational	Alt 1	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 2	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 3	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low
	Alt 4	Negative	Site	Short Term	Medium	Improbable	Short Term	Low	Medium	Low

### **8.1.3 Impacts on Faunal communities**

Disturbance to faunal communities will occur during the construction and, to a lesser extent, operational phases of the project. Elevated levels of disturbance will likely result in local faunal species moving away from the area and a subsequent localised decline in biodiversity (as certain species are more sensitive to

disturbances). Fauna occurring in adjacent habitats, outside of the direct impact zone, may also be negatively affected such as altering/impeding movement corridors. In the case of the project area, there has been both historic and current disturbance due to cultivation, increased human activity and road noise emanating from the R71. As such species persisting within the area likely show elevated tolerance to these disturbances. This following project activities may lead to disturbance of faunal communities:

#### Construction Phase

- Initial clearing/harvesting of vegetation during site establishment and preparing surface areas for construction, particularly within intact faunal habitats.
- Construction of infrastructure and temporary infrastructure such as access roads and contractors' laydown areas through or within areas of increased ecological sensitivity.
- Increased human activity within the project area and associated construction activities.
- Use of heavy machinery.
- Potential use of artificial lighting.

#### Operational Phase

- Ongoing disturbance within the project area and surrounds due to increased human activity.
- Movement of operational vehicles and maintenance crews through areas of increased ecological sensitivity known to provide habitat for faunal SCC.
- Likely alteration of faunal communities to those with a higher tolerance of anthropogenically modified landscapes. This will likely result in the decline in the likelihood of SCC being present.
- Disturbance beyond the project footprint areas, leading to loss of habitat quality.

Table 19: Assessment of impacts related to the loss of Floral and Faunal Habitats

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 2	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 3	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
	Alt 4	Negative	Site	Medium Term	Medium	Probable	Short Term	Medium Low	Medium	Medium Low
Operational	Alt 1	Negative	Site	Short Term	Medium Low	Improbable	Short Term	Low	Medium Low	Low
	Alt 2	Negative	Site	Short Term	Medium Low	Improbable	Short Term	Low	Medium Low	Low
	Alt 3	Negative	Site	Short Term	Medium Low	Improbable	Short Term	Low	Medium Low	Low
	Alt 4	Negative	Site	Short Term	Medium Low	Improbable	Short Term	Low	Medium Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact of the proposed project on the faunal ecology within the project area:

- Disturbance to sensitive habitats must be avoided and the project footprint must be clearly demarcated.
- The extent of construction activities must be limited to immediate surrounds of the approved substation site and powerline servitude.
- No wild animals may under any circumstance be handled or be interfered with by construction workers or any personnel.
- Low UV lighting must be utilised during the construction phase as well as the operational phase (associated with the substation) so as to not impact nocturnal faunal-invertebrate dynamics, through the attraction of species to these artificially lit areas.
- Any faunal species located on the site during the construction phase, which cannot relocate themselves must be moved to a more suitable location. This should be undertaken by a suitable qualified ecologist/faunal specialist.
- No dumping of waste may take place outside of the project area.

#### **8.1.4 Impacts on displacements of avifaunal species as a result of habitat loss or transformation**

This impact is dependent on the location and the scale of the facility. Extensive areas of vegetation (habitat) may be cleared to accommodate the considerable amount of infrastructure required, reducing the amount of habitat available to birds for foraging, roosting and breeding. The effect of the vegetation clearing is always more marked in woodland areas, where construction necessitates the removal of woody plants, and especially large trees. Relevant to this assessment, the areas earmarked for the proposed Aloe Substation and significant sections of the proposed 132kV Loop-In and Loop-Out power line alignments are degraded to a large extent. It is highly unlikely that Red List species will regularly use these areas for breeding purposes. The loss of habitat may potentially be more significant for the more common passerine species with small home ranges as entire territories could be removed during construction activities. While each of these species has the potential to be displaced by the construction of the substation and its associated power line infrastructure, identical habitat features prominently in the surrounding areas providing alternate foraging, roosting and breeding areas for the species observed. The displacement impact on the local avifauna as a result of habitat loss is rated to be of LOW significance and temporary as far as Red List species are concerned.

The impact assessment for the impacts on displacement of avifaunal species as a result of habitat loss and transformation shown in **Table 20**.



Table 20: Assessment of Impacts on displacement of avifaunal species as a result of habitat loss and transformation

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact of the displacement of avifaunal species as a result of habitat loss or transformation within the project are:

- Construction activity should be restricted to the immediate footprint of the infrastructure. The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the construction footprint and rehabilitation of disturbed areas is concerned.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red List species.
- Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.
- The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths.
- No off-road driving is allowed.
- Environmental Control Officers to oversee activities and ensure that the environmental management plan (EMPr) is implemented and enforced; Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks and laydown areas) must be undertaken and to this end a habitat restoration plan is to be developed by a specialist and included within the Environmental Management Plan (EMPr).

### 8.1.5 Impacts on displacement of avifaunal species as a result of disturbance

Excavation and construction activities are a source of significant disturbance particularly as a result of the machinery and construction personnel that are present on site for the duration of the construction of the proposed Aloe Substation and its associated Silica-Aloe and Thabamopo-Aloe 132kV Loop-In and Loop-Out power lines. For most bird species, construction activities are likely to be a cause of temporary disturbance impacting on foraging, and roosting behaviours but in more extreme cases, construction may impact on the

breeding success of certain species particularly if the disturbance happens during a critical part of the breeding cycle, resulting in temporary breeding failure or permanent nest abandonment. The study area is already subjected to a fairly significant degree of disturbance in the form of pastoral activities, cultivation as well as road and pedestrian traffic in the immediate vicinity of the proposed substation site and power line alignments. Species that have persisted within the study area are accustomed to the existing disturbance and may be temporarily displaced from the area. The low reporting rates for Red List species in the study area and their absence during the site visit, are an indication that they are not regularly utilising the area for breeding. This impact is anticipated to be of LOW significance and temporary as far as Red List species are concerned. Should this development be authorised, a detailed inspection would be required to establish if there are any breeding Red List species present within the development area. The impact assessment for the impacts on displacement as a result of disturbance on avifaunal species is shown in **Table 21**.

*Table 21: Impacts on displacement as a result of disturbance on avifaunal species*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
Operational	Alt 1	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Local	Short Term	Medium	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact on displacement as a result of disturbance on avifaunal species within the project are:

- A pre-construction inspection (walk-through) of the final substation layout and power line routes must be conducted to identify Red List species that may be breeding within footprint of the substation and the power line servitudes to ensure that the impacts to breeding species (if any) are adequately managed.
- Measures to control noise should be applied according to current best practice in the industry.
- Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of Red List species.
- Strictly limit power line and associated infrastructure construction and development to the proposed project footprint.
- Use existing roads as far as possible and limit the number of additional roads constructed.
- High traffic areas and buildings such as offices, batching plants, storage areas etc. should, where possible be situated in areas that are already disturbed.

- Existing roads and farm tracks should be used where possible.

### 8.1.6 Impacts on direct mortality as a result of construction activities

Bird mortality as a result of construction activities is improbable because birds are incredibly mobile and able to move out of harm's way. If mortality does occur, it is likely to be confined to a localised area and restricted to immobile species e.g. nestlings. No terrestrial bird species (ground) nest locations were observed during the site visit to the study area. The absence of Red List species nests may also be a result of the disturbance in the area and the resultant low report rates for large terrestrial species. Therefore, the impact on nestlings is rated to be of LOW significance. Should nests or breeding locations, pertaining to Red List species, be identified during the avifaunal inspection prior to the construction phase of this project, site specific mitigation must be implemented to ensure that this impact is reduced to negligible levels. The impact assessment for the impacts as a result of direct mortality of avifaunal species is shown in **Table 22**.

Table 22: Assessment of the impacts as a result of direct mortality of avifaunal species

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 2	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 3	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 4	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact on direct mortality of avifaunal species within the project are:

- Strictly limit power line and associated infrastructure construction and development to the proposed project footprint.
- Use existing roads as far as possible and limit the number of additional roads constructed.
- High traffic areas and buildings such as offices, batching plants, storage areas etc. should, where possible be situated in areas that are already disturbed.
- Existing roads and farm tracks should be used where possible.
- The minimum footprint areas of infrastructure should be used wherever possible, including road widths and lengths.
- No off-road driving is allowed.

Environmental Control Officers to oversee activities and ensure that the environmental management plan (EMPr) is implemented and enforced; Following construction, rehabilitation of all areas disturbed (e.g. temporary access tracks and laydown areas) must be undertaken and to this end a habitat restoration plan is to be developed by a specialist and included within the Environmental Management Plan (EMPr).

### 8.1.7 Impacts on mortality due to collision with earth wire of the powerlines

Collisions with large (132 kV or above) power lines are a well-documented threat to birds in southern Africa, while smaller lines pose a higher threat of electrocution but can still be responsible for collision. Collisions with overhead power lines occur when a flying bird does not see the cables, or is unable to take effective evasive action, and is killed by the impact or impact with the ground. Especially heavy-bodied birds such as bustards, cranes and waterbirds, with limited manoeuvrability are susceptible to this impact. Many of the collision sensitive species are also considered threatened in southern Africa. The Red Data species vulnerable to power line collisions are generally long living, slow reproducing species under natural conditions. Some require very specific conditions for breeding, resulting in very few successful breeding attempts, or breeding might be restricted to very small areas. These species have not evolved to cope with high adult mortality, with the results that consistent high adult mortality over an extensive period could have a serious effect on a population's ability to sustain itself in the long or even medium term. Birds may collide with the new grid connection over-head power lines, particularly during times of low light or poor visibility. This impact is rated to be of MEDIUM significance. The impact assessment for the impacts as a result of collision with the earth wire of the proposed 132kV Loop-In and Loop-Out power lines is shown in **Table 23**.

Table 23: Assessment of the impacts as a result of collision with the earth wire of the proposed 132kV Loop-In and Loop-Out power lines

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Low	Probable	Short Term	Low	Medium	Low
	Alt 2	Negative	Site	Medium Term	Low	Probable	Short Term	Low	Medium	Low
	Alt 3	Negative	Site	Medium Term	Low	Probable	Short Term	Low	Medium	Low
	Alt 4	Negative	Site	Medium Term	Low	Probable	Short Term	Low	Medium	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low

The following mitigation measures are proposed in order to limit or reduce the impact of collision with the earth wire of the proposed 132kV Loop-In and Loop-Out power lines within the project are:

- Where possible, power line infrastructure should avoid sensitive avifaunal habitats.

- Where possible, power line infrastructure should follow existing servitudes such as existing power lines, roads and fences.
- An avifaunal specialist must conduct a site walk through of the final power line route and pylon positions prior to construction to determine if, and where, bird flight diverters (BFDs) are required.
- Install bird flight diverters as per the instructions of the specialist following the site walkthrough, which may include the need for modified BFDs fitted with solar powered LED lights on certain spans.
- The operational monitoring programme for the site must be in line with applicable monitoring guidelines and must include regular (i.e. at least every two months) monitoring of the power line for collision (and electrocution) mortalities. Any mortalities should be reported to the Endangered Wildlife Trust (EWT).
- High risk sections of power line must be identified by a qualified avifaunal specialist during the pre-construction inspection (walk-through) phase of the project, once the alignment has been finalized.
- Bird flight diverters to be maintained on sections of power line during the operational life span of the 132kV Loop-In and Loop-Out power lines.

#### **8.1.8 Impacts on mortality of red list species due to electrocution**

Electrocution refers to the scenario where a bird is perched or attempts to perch on the electrical structure and causes an electrical short circuit by physically bridging the air gap between live components and/or live and earthed components (van Rooyen 2004). Electrocution risk is strongly influenced by the power line voltage of the and design of the tower structure and mainly affects larger, perching species, such as vultures, eagles and storks, easily capable of spanning the spaces between energized components. This is particularly likely when more than one bird attempts to sit on the same pole/tower, a behaviour that is typical of vultures when perching or roosting. The risk of electrocution on the proposed power line poles/towers is evaluated to be of LOW significance.

In terms of electrocutions within the proposed Aloe Substation, the avifaunal specialist as reported that they are possible but should not affect the more sensitive Red List bird species as these species are unlikely to use the infrastructure within the yard for perching or roosting. The risk of electrocution within the substation is therefore evaluated to be LOW. The impact assessment for the impacts as a result of mortality of Red List species due to electrocution on the power line towers and within the substation is shown in **Table 24**.

*Table 24: Assessment of the impacts as a result of mortality of Red List species due to electrocution on the power line towers and within the substation*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 2	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 3	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
	Alt 4	Negative	Local	Short Term	Medium	Definite	Short Term	Low	Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the mortality of Red List species due to electrocution on the power line towers and within the substation within the project are:

- It is highly recommended that the steel/concrete monopole design be used and that this incorporates the standard bird perch.
- Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles must also be considered.
- Insulating material to be maintained during the operational life span of the 132kV Loop-In and Loop-Out power lines.
- Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine line patrols of the 132kV Loop-In and Loop-Out power lines to the Eskom- Endangered Wildlife Trust Strategic Partnership.
- Any power line/s must be of a design that minimizes electrocution risk by using adequately insulated bird friendly monopole structures, with clearances between live components of 2m or greater and which provide a safe bird perch.

### **8.1.9 Impacts of birds on the quality of electrical supply**

It is important to mention that birds could have an impact on the proposed power line infrastructure and the hardware within the substation. Both bird streamers and bird pollution occur as a result of birds perching and defecating on the pole tops and, often directly above live conductors causing electrical faults on power lines. The more faults that occur on a line, the poorer the quality of electrical supply to the end users. Site specific mitigation can be applied reactively should this impact occur. Bird nests may also cause faults through nest material, protruding into the air gap between live components on the power line and substation infrastructure. Crows in particular often incorporate wire and other conductive material into their nests. When nests cause flashovers, the nesting material may catch fire. This in turn can lead to equipment damage or a general veld

fire. Power line poles/towers in turn provide nesting substrate for certain bird species, some of which might benefit through the increased availability of nesting substrates both on the power line and substation infrastructure. The impact assessment for the impacts as a result of birds on the quality of electrical supply is shown in **Table 25**.

*Table 25: Assessment of impacts as a result of birds on the quality of electrical supply*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
	Alt 2	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
	Alt 3	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
	Alt 4	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact of birds on the quality of electrical supply within the project are as follows:

- The operational monitoring programme for the site must be in line with applicable guidelines and must include regular (i.e at least every two months) monitoring of the power line and the new associated substation for electrocution (and collision) mortalities. Any mortalities should be reported to the EWT.
- Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine line patrols of the 132kV Loop-In and Loop-Out power lines to the Eskom- Endangered Wildlife Trust Strategic Partnership.
- A pre-construction inspection (walk-through) of the final substation layout and power line routes must be conducted to identify Red List species that may be breeding within footprint of the substation and the power line servitudes to ensure that the impacts to breeding species (if any) are adequately managed.

#### **8.1.10 Impacts on disturbance and degradation of vegetation**

During construction, the clearing and preparation of the distribution line route and storage of equipment may lead to the disturbance and degradation of vegetation (towards the southern terminus). The vegetation persists in a predominantly natural state, although it has been visibly impacted by several anthropogenic impacts related to subsistence farming, livestock grazing and natural resource harvesting by the local community. These impacts together with the effect they have on this area has been rated as low of significance, as the disturbance footprint can be reduced if the appropriate mitigations are put into place. The

impact assessment for the impacts on the disturbance and degradation of wetland vegetation in shown in **Table 26**.

Table 26: Assessment for the impacts on the disturbance and degradation of wetland vegetation

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium Low	Low
	Alt 2	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium	Low
	Alt 3	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium	Low
	Alt 4	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact on the disturbance and degradation of vegetation within the project area:

- Restrict the disturbance and clearance footprint to within 15 m on either side of the proposed powerline route (30 m disturbance corridor).
- The proposed substation layout and powerline route is optimally situated away from vegetation that is influenced by the river.
- Avoid shifting the route any further west as it will encroach on the depression. Additionally, vegetation structure and diversity increase towards the Koppie in the west where stands of *Aloe marlothi*, *Euphorbia ingens* and *Sclerocarya birrea* become more prolific.
- Although the prescribed post-mitigation buffer as per the national buffer determination tool is 15 m attempt wherever possible to maintain a 100 m buffer on the Diep river to lower the potential for bird collisions which are highest near watercourses.
- Try to reduce the 30 m disturbance footprint and the unnecessary clearing of vegetation when traversing the identified drainage lines.
- Make use of existing access routes as much as possible, before new routes are considered. Any selected “new” route must not encroach into the wetland areas.

Refer to the EMPr in **Appendix H1** and the Alien Invasive Management Plan **Appendix H2** for additional mitigation measures.



### 8.1.11 Impacts on increased bare surfaces, runoff and potential for erosion

Due to the removal of natural vegetation and alteration of the landscape during the construction phase the potential for loss of soil due to erosion is present and must be monitored. The cumulative impact of this development is expected to be low due to the low potential of the land in the area. Adequate erosion control measures will need to be implemented to reduce the risk of soil erosion during the operational phase. The impact assessment for the impacts on increased bare surfaces, runoff and potential for erosion are shown in **Table 27**.

*Table 27: Assessment for the impacts on increased bare surfaces, runoff and potential for erosion*

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium Low	Low
	Alt 2	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium	Low
	Alt 3	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium Low	Low
	Alt 4	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact on increased bare surfaces, runoff and potential for erosion within the project area:

- Keep pylon hole excavation and soil heaps neat and tidy.
- Limit construction activities to the dry season when storms are least likely to wash concrete and sand into wetlands.
- Ensure soil stockpiles and concrete / building sand are sufficiently safeguarded against rain wash.
- Mixing of concrete must under no circumstances take place in any wetland or their buffers. Scrape the area where mixing and storage of sand and concrete occurred to clean once finished.
- Do not position any of the pylons within any of the delineated wetland areas. This should be easily achievable given the proposed route which is currently situated outside of wetland areas.
- Do not situate any of the construction material laydown areas within any wetland.
- No machinery should be allowed to be parked in any wetlands.

Detailed recommendations are contained in the Erosion and Soil Management Plan attached as **Appendix H3**.

### 8.1.12 Impacts on contaminations of wetlands due to hydrocarbons and spillages

Surface and groundwater quality impacts as a result of spillages and wastage and / or potential runoff of spilled materials could cause harm to the environment during construction activities. Although, this is regarded to be of low significance, it is important for the impacts to be assessed in order for the proper mitigation measures to be put into place. The impact assessment for the contaminations of wetlands due to hydrocarbons and spillages is shown in **Table 28**.

Table 28: Assessment of impacts on contaminated wetlands due to hydrocarbons and spillages

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
	Alt 2	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium Low	Low
	Alt 3	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Low	Low
	Alt 4	Negative	Local	Long Term	Medium	Definite	Short Term	Medium	Medium Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact of the proposed project on contaminations of wetlands due to hydrocarbons and spillages within the project area:

- Make sure all excess consumables and building materials / rubble is removed from site and deposited at an appropriate waste facility.
- Appropriately contain any generator diesel storage tanks, machinery spills (e.g. accidental spills of hydrocarbons oils, diesel etc.) or construction materials on site (e.g. concrete) in such a way as to prevent them leaking and entering the north-western seep.
- Mixing of concrete must under no circumstances take place within the permanent or seasonal zones of the wetland.
- Check for oil leaks, keep a tidy operation, and promptly clean up any spills or litter.
- Provide appropriate sanitation facilities for workers during construction and service them regularly.
- The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected must be disposed of at a licensed disposal facility.
- The Contractor must be in possession of an emergency spill kit that must be complete and available at all times on site.
- Any possible contamination of topsoil by hydrocarbons must be avoided.
- Any contaminated soil must be treated in situ or be placed in.

### 8.1.13 Impacts on waste generated

Waste generated during the project activities may have the following impacts on the environment:

#### *Construction phase*

Waste generation during the construction phase would have a negative impact on the environment, if not controlled adequately. Waste includes general construction rubble, hazardous waste (used oil, cement and concrete etc.).

#### *Operational phase*

Waste generation during the operation phase would have a negative impact on the environment, if not controlled adequately. Waste includes general waste or hazardous waste (used oil etc.).

The impact assessment on waste generation is shown in **Table 29**.

*Table 29: Assessment of impacts related to waste generation*

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Site	Short term	Medium	Probable	Reversible (short term)	Medium	Low	Low
Operation	Negative	Site	Short term	Low	Improbable	Reversible (short term)	Low	Low	Low

The following mitigation measures are proposed in order to limit or reduce the impact of the proposed project on waste generation within the project area:

- Efforts must be made to ensure waste on site must be recycled and reused.
- Disposal of waste must be in accordance with relevant local and provincial legislative requirements.
- The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation.
- Burning of waste material would not be permitted.
- Where possible, construction waste on site must be reused or recycled.

Further detailed mitigation measures are included in the EMPr (**Appendix H1**).

## 8.2 Theme 2: Impacts on the Socio-Economic Environment

### 8.2.1 Social Impacts

#### (a) Influx of workers

This variable refers to the inflow of temporary workers during the construction phase of the project. Given the specialists nature of the powerline construction, specialist contractor teams would be appointed by Eskom for the construction phase of the project. These contractor teams would consist of highly skilled specialists, semi-skilled and unskilled workers. The nature, extent and intensity of this impact would thus depend on the number of locals that would form part of the contractor teams and whether construction camps would be set up to house the temporary “outside” workforce within the study area.

It is expected that the influx of construction workers will have a relatively minor impact on the local communities. This is because most of the low- skilled and semi-skilled workers will be employed from the existing community. Moreover, the lack of basic services and relative distances to local towns will also to some extent deter the influx of outsiders. However, this aspect should be monitored throughout the construction phase. Because of the location of the development near a low-income community, theft and damage to infrastructure is a concern. There will be no cumulative impact of the facility on the local informal settlement. The overall assessment of this impact is summarised in **Table 30**.

Table 30: Assessment of impacts on influx of workers

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Positive	Local	Short Term	Medium	Probable	Short Term	Medium	Positive	No Significance
	Alt 2	Positive	Local	Short Term	Medium	Probable	Short Term	Medium	Positive	No Significance
	Alt 3	Positive	Local	Short Term	Medium	Probable	Short Term	Medium	Positive	No Significance
	Alt 4	Positive	Local	Short Term	Medium	Probable	Short Term	Medium	Positive	No Significance
Operational	Alt 1	The project will create an enabling environment for potential temporary job or material and equipment supply opportunities for the local residents and suppliers. These opportunities will only be in the construction phase as all operation activities will be undertaken by Eskom staff.								
	Alt 2	The project will create an enabling environment for potential temporary job or material and equipment supply opportunities for the local residents and suppliers. These opportunities will only be in the construction phase as all operation activities will be undertaken by Eskom staff.								
	Alt 3	The project will create an enabling environment for potential temporary job or material and equipment supply opportunities for the local residents and suppliers. These opportunities will only be in the construction phase as all operation activities will be undertaken by Eskom staff.								
	Alt 4	The project will create an enabling environment for potential temporary job or material and equipment supply opportunities for the local residents and suppliers. These opportunities will only be in the construction phase as all operation activities will be undertaken by Eskom staff.								

The following mitigation measures could be implemented to reduce the impacts:

- Eskom and the contractors should maximise the use of local labour where possible by developing a strategy to involve local labour in the contractor teams and construction process.

- Before construction commences, representatives from the local authority and community-based organisations, as well as neighbouring and/or affected residents should be informed of the details of the construction company (contractor), size of the workforce and construction schedules.
- Conditions stipulated by property owners in terms of the construction activities should be implemented and monitored.
- Contractors and temporary employees should behave fittingly at all times.
- Workers should receive fines if they do not adhere to the conditions, rules and regulations.
- Workers should be made aware of property owners' concerns regarding construction work on their properties so that they are familiar with the sensitive issues.
- A specific contact person should be identified to allow community members and property owners to easily direct their queries and concerns and obtain general information regarding the construction process.

#### (b) Safety and Security Impact

Safety and security impacts include construction related risks and accidents, vehicular accidents, the perceived increase in crime as a result of outsiders being in the area and the possible increased risks of veld fires. It is also important to note that there is theft of livestock in the area, therefore it is important for labourers to be aware of cattle on site and not undertake any criminal activity that could jeopardise the project. This impact would be more severe in the areas where the construction sites are in close proximity to residential neighbourhoods and in areas with high levels of pedestrian movement e.g. in the vicinity of schools. The impact is evaluated on **Table 31** as follows:

*Table 31: Assessment of impacts on safety and security*

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium Term	Medium	Probable	Short term	Low	Medium	Low
Operational	Negative	Local	Short term	Low	Improbable	Short term	Low	Low	Low

The following mitigation measures should be put in place:

- Personal protective equipment and clothing should be given to workers and enforced to avoid construction related accidents.
- It is recommended that Eskom embark on a traffic awareness campaign prior to the construction phase in the high-density residential areas focused on schools and pedestrians.

- The movement of construction vehicles through the local communities should be limited to off-peak periods (if possible) to minimise adverse impacts on the movement of pedestrians (individuals walking to and from work and schoolchildren) and to a lesser extent on private vehicular traffic.
- Construction vehicles should keep to the speed limits.
- Signs must be erected at strategic locations throughout the area, warning residents and visitors about the hazards around the construction site and the presence of heavy vehicles
- The contractor and Eskom should develop safety management plans which should be discussed with construction workers prior to construction.
- Construction workers should preferably not prepare food at the construction sites to limit the risks of veld fires.
- Construction sites should be fenced off to avoid unauthorised entry.
- Local labour should be used as far as possible to limit the influx of an outside work force.

### 8.2.2 Impacts on Agricultural practices

The existing agriculture in the area is very limited as the area is dry in terms of vegetation and grassland to allow for cattle to graze. The vegetation on site has been degraded due to previous anthropogenic activities and developments. The intensity of the impact on agricultural activities would thus depend on the type of activities undertaken on the project area as well as the location of the distribution line. In the long term, even if the farming activities would be maintained, the negative impacts are not perceived to be severe as most farming activities could continue underneath distribution lines. The impact is evaluated on **Table 32** as follows:

Table 32: Assessment of impacts on agricultural practices

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
	Alt 2	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
	Alt 3	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
	Alt 4	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The following mitigation measure could be implemented:

- Eskom should select towers and construction approaches to have the minimum impact on agricultural practices.

### 8.2.3 Impacts on dust and air quality

Dust emissions would vary from day to day depending on the phase of construction, the level of activity, and the prevailing meteorological conditions. The following possible sources of fugitive dust have been identified as activities which could potentially generate dust during construction operations at the site:

- vehicle activities associated with the transport of equipment to the site.
- preparation of the surface areas which may be required prior to the set-up of new infrastructure.
- the removal of construction equipment from site after the set-up of new equipment.

The impact assessment on dust generation is shown in **Table 33**.

Table 33: Assessment of impacts on dust and air quality

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short term	Medium	Probable	Reversible (short term)	Medium	Medium Low	Low
Operational	<i>Very little to No dust will be generated during the operation phase of the project</i>								

The following mitigation measure is proposed in order to limit or reduce the impact of the proposed project on dust generated within the project area:

- Frequent and effective dust-suppression is advised, particularly along dirt roads, especially 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.
- A continuous dust monitoring process needs to be undertaken during construction.
- Speed restriction of no more than 10km/h must be implemented for all construction vehicles within the construction site; and
- All vehicles transporting friable materials such as sand must be covered by a tarpaulin or wetted down.

### 8.2.4 Impacts on noise generated

During the construction phase there is likely to be an increase in noise pollution. The following possible sources of noise could potentially generate noise pollution during construction: construction activities (excavating and site clearing); construction vehicles; and construction staff. The impact assessment on noise generation is shown in **Table 34**.

Table 34: Assessment of impacts on noise generated

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short Term	Medium	Probable	Short Term	Medium	Medium Low	Low
Operational	Negative	Local	Short Term	Low	improbable	Short Term	Low	Low	Low

The following mitigation measure is proposed in order to limit or reduce the impact of the proposed project on noise generated within the project area:

- Notification of adjacent landowners must be done on any envisaged noisy construction activities e.g Blasting.
- Provide all equipment and vehicles with standard silencers that are continuously maintained.
- It must be noted that when the noise exceeds 85 dBA employees should wear ear protection equipment.
- The working hours stipulated in the Construction permit, where applicable, must be adhered to. Where this is not applicable, the following working hours must be adhered to: Monday to Friday 07:00 – 17:00 for weekdays. Working hours during weekends must be agreed between Eskom and the Contractor.
- All construction plant and other equipment must be in a good working order to reduce possible noise pollution; and
- Noise reduction is essential, and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving.

### 8.2.5 Impacts on traffic on local roads

The movement of construction vehicles during the construction phase can result in an increase in traffic congestion on local roads. It must however be highlighted that the access road that will be used is not situated in a busy road and thus traffic will not cause a huge impact and can be managed with mitigation particularly during the construction phase. During the maintenance phase, traffic impacts will be significantly low. The assessment of this impact is indicated in **Table 35**.

Table 35: Impacts on Assessment of traffic on local roads

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium Term	Medium	Probable	Short term	Low	Medium Low	Low
Operational	Negative	Local	Short term	Low	Improbable	Short term	Low	Low	Low



The proposed mitigation measures for the management of traffic brought about by construction activities are as follows:

- There must be an erection of signage warning motorists about the presence of construction vehicles. These must be placed at the main entrance to the site off the R71;
- Construction activities must be limited to daytime hours;
- Construction vehicles must not exceed speeds on 10km within the construction site;
- Construction vehicles travelling on public roads must adhere to speed limits; and
- Construction vehicles must not dispose of soil or other material on roads. Where this occurs, the ECO and Contractor must ensure that the material must be removed before the end of the working day.

### 8.2.6 Impact on Access Roads

During the construction phase and maintenance of power lines and substations, some habitat destruction and transformation inevitably takes place. This happens with the construction of access road. An access road will be required for access to the proposed 132kV substation. It must also be noted that there is an existing access road that is maintained by Sand Hawks. All access roads will need to be maintained for the purpose of making them drivable for all vehicles that will be using the road for construction and operational phase of the project. Additional access will be required for Layout Alternative 2 and 4 which are situated further from the existing access roads. The impacts are evaluated on **Table 36** below:

Table 36: Assessment of Impacts on Access Roads

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
	Alt 2	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
	Alt 3	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Low	Low
	Alt 4	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Low	Low

The proposed mitigation measures for the management of access roads are as follows:

- Use should be made of existing roads as far as possible, ensuring proper maintenance/upgrade. Alternative methods of construction / access to sensitive areas are recommended.
- No vehicles should be allowed to cross rivers or streams in any area other than an approved crossing, taking care to prevent any impact (particularly erosion) in surrounding habitat.

- Vehicular traffic shall not be allowed in permanently wet areas, no damage shall be caused to wet areas. Where necessary, alternative methods of construction shall be used to avoid damage to wet areas.
- Any work or access near or in a permanent drainage system may have implications in terms of the National Water Act, 1998 (Act No. 36 of 1998), and therefore may well require the application of a Water Use License. Therefore, the Contractor must in consultation with the ECO, assess all areas along the alignment well in advance in order to ensure the relevant Water Use License is applied for where required.

### 8.2.7 Impacts on Health and Safety

The Construction activities planned will bring about various impact that can affect the Health and Safety of human beings. Some of the impacts are applicable to the Operational Phase where maintenance of the site will be undertaken. Based on this, Health and Safety issues are crucial to the project. There is the potential risk of electrocution (people and livestock) if access to the site is not controlled. The overall assessment of this impact is summarised in **Table 37**.

Table 37: Assessment of impacts on Health and Safety

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
	Alt 2	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
	Alt 3	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
	Alt 4	Negative	Site	Medium Term	Low	Probable	Short Term	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 2	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 3	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low
	Alt 4	Negative	Site	Short Term	Low	Improbable	Short Term	Low	Medium	Low

The generic mitigation methods to ensure the Health and safety of all site personnel as well the public are as follows:

- The site and any excavations within it must be fenced off as safety mechanisms during the construction phase;
- Suitable Personal Protective Equipment (PPE) must be worn at all times by all employees on site during the construction and maintenance phases of the project;
- Detailed Health and Safety issues will be addressed in reports compiled by the most relevant parties.
- It is recommended that the landowners and affected community members be contacted in advance to ensure that they are forewarned of the construction and maintenance activities planned in the area.

In addition, the local community must be educated about the dangers of high voltage electricity. Safety and security issues should be addressed as a priority by Eskom.

### 8.2.8 Impacts on Heritage and Palaeontology

Construction activities such as excavations and grading could expose or damage features of heritage and cultural value beneath the surface. Graves have been identified on site. Refer to **Table 38** for an assessment of potential impacts on heritage resources.

Table 38: Assessment of impacts on heritage resources

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 2	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 3	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 4	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low

In order to protect Heritage Resources on site, the following mitigation measures are proposed:

- The identified grave sites must be isolated, e.g. by fencing them off. All residents and their visitors should be informed that these are no-go areas, unless accompanied by the individual or persons representing the Environmental Control Officer as identified above.
- If anything of heritage importance is noted outside what has been identified in the Heritage report or the site walk through, work in that area should be stopped and the occurrence should immediately be reported to an archaeologist and the archaeologist should then investigate and evaluate the find.
- A person or entity, e.g. the Environmental Control Officer, should be tasked to take responsibility for the heritage sites and should be held accountable for any damage.
- In areas where vegetation is threatening the heritage sites, e.g. growing trees pushing walls over, it should be removed, but only after permission for the methods proposed has been granted by SAHRA. A heritage official should be part of the team executing these measures.
- Any discovered artefacts shall not be removed under any circumstances. Any destruction of a site can only be allowed once a permit is obtained and the site has been mapped and noted. Permits must be obtained from the South African Heritage Resources Agency (SAHRA).

### 8.2.9 Visual Impacts

Construction processes and sites are unsightly and can affect an area's sense of place. The clearance of indigenous vegetation will further result in adverse visual impact. In addition to this, the communication tower presents a visible structure which will be a permanent feature during the operational phase.

Table 39: Assessment of visual impacts

Project phase	Alt	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Alt 1	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 2	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 3	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
	Alt 4	Negative	Site	Permanent	Low	Probable	Irreversible	Medium	Medium	Low
Operational	Alt 1	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 2	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 3	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low
	Alt 4	Negative	Site	Permanent	Low	Improbable	Short Term	Low	Low	Low

In order to mitigate the potential visual Impacts, the following measures are proposed:

- Painting of steel pole structure to match its background to minimize visual contrast with the existing landscape.
- Revegetation of all areas disturbed during project construction
- Dust levels must be kept down by regularly wetting dirt roads and exposed soil areas inside the site.
- The location of the construction site camp must be shielded from the main road away from the view of people visiting or staying in the area.
- Remove all waste, through authorised service providers, including cleared vegetation from site as soon as possible unless the material will be reused on site.
- Domestic waste generated from the site camp must be kept in labelled bins with lids and removed every week or more often as the need arises and be disposed of at a registered landfill.

### 8.3 Cumulative Impacts

The NEMA EIA Regulations (2014) defines a “cumulative impact” in relation to an activity, as the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities. This is required on the basis that 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.

Cumulative impacts are those impacts from the project combined with the impacts from past, existing and reasonably foreseeable future projects that would affect the same biodiversity or natural resources (e.g. a number of development projects in the same catchment or ecosystem type collectively affecting water quality or flow, or impacting the same endemic species).

The majority of the project area is located within a designated CBA1 area, with the remainder of the project area (1km corridor) falling within a CBA2 area. The loss of habitat within the CBAs would potentially result in a loss of biodiversity as well as a potential loss in ecosystem function within the CBA, with negative consequences for biodiversity maintenance in the long-term. Habitat loss due to construction of the powerline would result in cumulative impacts on available habitat and reduce the effective functioning of the CBA. This would also increase habitat fragmentation and potentially result in a loss of broad-scale landscape connectivity. The remaining tracts of intact bushveld (such as that within the southern extent of the project area) and granite outcrops are likely to become increasingly important for local biodiversity as developments continue to expand.

Mitigation measures to ameliorate these impacts during the construction, operational and decommissioning phases of the project have been discussed in some sections of this chapter and are prescribed in detail in the EMP<sub>r</sub> attached as **Appendix H1** of this report.

## 9 CONCLUSION, ENVIRONMENTAL IMPACT STATEMENT AND RECOMMENDATIONS

Eskom is applying for an environmental authorisation to construct the Aloe Substation and LILO Powerlines on the farms Kalkfontein 1001 LS and Majebeskraal 1002 LS, about 18km east of the Polokwane CBD along the R71 to Tzaneen within the Polokwane Local Municipality. The issuing of an EA is crucial to the project as it will allow for the construction and subsequent operation and maintenance of the substation in order for Eskom to fulfil its mandate to provide increased access to reliable and improved electricity in South Africa.

Based on the summary of this Basic Assessment, it is a conclusion of this report that the proposed project will have moderate to low impacts on the bio-physical environment, provided all mitigation measures detailed in this report as well as the EMP are adhered to. It is anticipated that the proposed project will improve the current status of the distribution network to the Polokwane and satisfy the electricity requirements of the customers in the area and meet the escalating electricity demands in the greater Polokwane area.

In the undertaking of any Basic Assessment Process, Public participation is a legislative requirement as set out in the NEMA EIA Regulations. The Public participation process involved sourcing of comments from I&AP, particularly adjacent landowners. On the 5th of June 2020, the Minister of Environment, Forestry and Fisheries issued Directions Regarding Measures to Address, Prevent and Combat the Spread of COVID-19 Relating to NEMA Permits and Licenses. The Draft BAR has been submitted as per these Directions which provide the process to be followed in undertaking public participation while ensuring that the EAPs actions curtail the threat posed by the Covid-19 pandemic and to alleviate, contain and minimise the effects of the national state of disaster.

### 9.1 Environmental Impact Statement

In terms of Section 24 of NEMA, A total of four (4) alternative types were assessed for the project, namely substation *location alternatives*, powerline infrastructure *design alternative*, powerline *routing alternatives* and *layout alternatives* in addition to the no-go alternative. The advantages and disadvantages of each of these alternatives as well as the reason for the preferred alternative are presented in this report. Following the assessments of the alternative types, Four (4) layout alternatives were fully assessed for the proposed development. The findings and recommendation of the specialist's studies supports the use all proposed alternatives subject to adherence to the

proposed mitigation measures. However, Layout alternative 1 is recommended because it poses less risks to the environment due to the level of disturbance in the proposed substation footprint, whereas the proposed route for the loop in and loop out powerline presents the least disturbance as compared to the alternative 1 route alignment.

The proposed development will not require significant clearance of protected plant species or Species of Concern however the applicant must apply for a permit from DEFF to cut, disturb or remove a number of identified protected tree species (*S. birrea* subsp. *caffra*) as per the recommendations of DEFF. The Geotech investigations indicate that the ground cover is suitable for construction activities. **Layout alternative One (1), consisting of the substation located north of the Lepelle pipeline with Silica Aloe Loop-in (green) and Thabamooop Loop out (red) Route is therefore recommended as the preferred site alternative. The proposed development will have an overall, long term, positive effect on the immediate environment and the region as a whole.**

Layout alternative 3 has similar impacts to the preferred layout alternative 1, however will have more environmental impacts due to the location of the proposed substation within an area located within the remaining extent of Polokwane Plateau Bushveld with No historical site clearance and the presence of protected trees species.

In terms of the no-go option, this entails the non -construction of the proposed substation and power lines. Although this option would result in fewer impacts on the biophysical environment. It should be noted that most of the study area has already been impacted upon by practices such as over grazing, wood collection and urbanisation. Electricity has become a fundamental need and precursor of development and improvement of people's quality of life. If the proposed establishment of new power lines cannot go on, the option would greatly affect the future electricity supply to the area and the future mines. When the project is finished, it would further help ensure that there is continuous power supply to the area, its surrounding rural communities and the entire Municipal area.

The reliable electricity source would open the door to new economic opportunities, within the general area, in turn contributing to an increase in the local GDP. Otherwise the loss of electricity, power outages and associated negative ripple effects on the communities, local businesses and the environment e.g. increased wood harvesting and air pollution caused by the usage of fossil fuels. *The significance of negative impacts posed by utilising the no-go option can therefore be considered as high.*

Direct impacts:

- No additional electricity to the local community;
- Frequent power outages; and

- No employment opportunities will be created.

Indirect impacts:

- Negative impact on local enterprises and educational facilities;
- Negative impact on the environment as people would rely on fuelwood and other natural sources for heat and energy;
- Pollution from the burning of fossil fuels to create energy;
- Time wasted on looking for alternative energy sources; and
- Limited development would take place in the area without reliable supply of electricity.

Furthermore, each of the impacts can however be mitigated through the measures indicated in **Chapter 8** of this report as well as in the Environmental Management Programme attached as **Appendix H1** of this BAR. Other Management Plans have also been developed to manage alien invasive species (**Appendix H2**), erosion and soil management (**Appendix H3**). These plans must be supplemented with additional conditions from the Environmental Authorization that will be issued by DEFF as the Competent Authority.

It is therefore a conclusion of the EAP that the applicant's preferred alternative be approved, provided the mitigation measures outlined in this Basic Assessment are implemented.

By improving the overall efficiency of the power grid, this new development accelerates the broader adoption of electricity distribution in the area. Once the Environmental Authorization has been received for the proposed activities, Eskom can then proceed with the construction of the New Aloe Substation and LILO Powerlines.

## 9.2 EAP's Recommendations

This Basic Assessment report has provided a comprehensive assessment of the potential environmental impacts associated with the proposed activity. These impacts have been identified by the EAP and the Specialists commissioned for this development. The key findings of the Basic Assessment Process have been discussed in this report. It is the considered opinion of the EAP that the proposed New Aloe Substation and LILO Powerlines (Layout Alternative 1) is the most effective way of meeting the need and purpose of the proposed activity and will enhance the environmental benefits of the proposed activity and avoiding potentially significant negative impacts.

Based on the historical vegetation clearance, Layout alternative 1 is the preferred option, as the site allows for construction activities to take place with the least impact on the receiving environment.



Impacts of high significance are not foreseen once proper mitigation measures have been implemented. It is therefore recommended that the environmental authorities subject the proposed application to the following conditions:

- Once the powerline alignment and positioning of poles have been finalised, a final walkthrough of the alignment must be undertaken by a suitably qualified ecologist in order to confirm the presence or absence of floral SCC, protected species and TOPS-listed species;
- The applicant must apply for a permit from DEFF to cut, disturb or remove number of protected tree species (*S. birrea subsp. caffra*) affected must be determined as part of the DEFF permit application to cut, disturb, damage or destroy these trees;
- The applicant must apply for a Water use Licence from the Department of Water Affairs in areas where water resources are impacted (streams and wetland crossing) before commencement of construction in those areas;
- The Diep River should be regarded as “No-Go” areas for the proposed power lines and substations, access tracks and related activities. The 1: 100 year floodline and a 100m line from the centre of the spruit, whichever is the greatest will be regarded as “No-Go” areas. Should the applicant decide to place any structure within the wetland areas or its buffer zone or within the flood lines, such activities must be undertaken as per the requirements of the Water Use License;
- A walk-down of the power line route must be undertaken by a Heritage Resource Specialist prior to commencement of the construction phase to ensure avoidance of recorded heritage features;
- All adjacent landowners must be informed of the commencement of construction activities at least 30 days before the commencement;
- An Independent Environmental Control Officer must be appointed to monitor all construction activities and ensure the demarcation of all applicable areas and approve the locations of all infrastructure;
- The Contractor’s site camp, must be located in the most disturbed section of the project area and sufficiently concealed from the local community and visitors to the area;
- The Silica-Aloe & Thabamoopo-Aloe 132kV power lines must be constructed using the proposed bird friendly structure i.e. steel monopole structure painted with a paint coating that mitigates its visual impact;

- Insulating material to be maintained during the operational life span of the Silica-Aloe & Thabampo-Aloe 132kV power lines.
- High risk sections of power line must be identified by a qualified avifaunal specialist during the pre- construction inspection (walk-through) phase of the project, once the alignment has been finalized. If power line marking is required, bird flight diverters must be installed according to industry standard guidelines.
- Bird flight diverters to be maintained on the sections of power line during the operational life span of the Silica-Aloe & Thabampo-Aloe 132kV power lines.
- Construction activity should be restricted to the immediate footprint of the infrastructure. The recommendations of the terrestrial biodiversity study must be strictly implemented.
- Access to the remainder of the site must be strictly controlled to prevent unnecessary disturbance to conservation species of concern.
- Operation of plant and site vehicles should be done with care. No damage permitted to terrestrial plants on adjacent properties.
- All operators and maintenance crew of the substation must adhere to SANS 10234 standards in the handling and storage of hazardous chemicals.
- Material Safety Data Sheet (MSDS) for all hazardous chemicals must be kept on site during Construction and operation and updated regularly.
- Maximum use should be made of existing roads and the construction of new roads must be kept to a minimum. New roads are to be located in areas of existing high disturbance, and not encroach upon sensitive habitats.
- It is recommended that should any material or artefacts of cultural significance found during exaction, all activities should cease and SAHRA and/ or an Archaeologist be informed immediately.
- Adhere to all recommendations outlined in the Environmental Management Programme and management plans attached as **Appendix H1**.

It is therefore strongly advised that the recommendations highlighted in this section be included as conditions of authorisation by the DEFF. GA Environment's recommendation following this Basic Assessment is that the applicant Eskom be granted an Environmental Authorisation for the proposed New Aloe Substation and Loop in Loop Out Powerlines subject to the condition that all Mitigation Measures provided be strictly adhered to and closely monitored by an independent EAP to avoid adverse environmental Impacts. .

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