



## **BASIC ASSESSMENT PROCESS**

for

**THE PROPOSED CONSTRUCTION OF THE DIHATSHWANE SUBSTATION AND  
88 KV LOOP IN LOOP OUT (LILO) POWER LINE IN ROOIGROND, MAHIKENG  
LOCAL MUNICIPALITY, NORTH WEST PROVINCE**

**Revised DRAFT BASIC ASSESSMENT REPORT**

Public Review Period:

**25 MAY 2023 – 26 JUNE 2023**

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## PUBLIC REVIEW OF THE REVISED DRAFT BASIC ASSESSMENT REPORT

*A draft Basic Assessment Report (DBAR) was released for public review in November 2022 for a 30-day public review period. At the time, the DFFE requested additional alternative sites be assessed and proof of consultation with Mafikeng Game Reserve Management Board be provided.*

*This revised DBAR has been compiled to address DFFE comments raised in the November 2022 report, therefore the current report includes i) an additional alternative site (see section 2.3) and communication with the Mafikeng Game Reserve Management Board.*

This **revised Draft BA Report** has been distributed to all registered IAPs and is made available for public review and comment at the following locations from **25 May 2023 – 26 June 2023**:

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30 Robinson Street,  
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**I&APs are requested to submit comments by the 26 June 2023:**

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**PROJECT DETAILS**

<b>Report Title</b>	:	Basic Assessment Report
<b>Report Status</b>	:	Draft
<b>Review Period</b>	:	<b>25 May 2023 – 26 June 2023</b>
<b>Project Title</b>	:	The Proposed construction of the Dihatshwane Substation and 88 kV Loop in Loop Out (LLO) Power Line in Rooigrond, Mahikeng Local Municipality, North West Province
<b>Applicant</b>	:	Eskom Holdings SOC Ltd
<b>Environmental Consultant</b>	:	Envirovolution Consulting (Pty) Ltd
<b>DFFE Reference No.:</b>	:	New Application

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## DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

### I. DECLARATION

Envirolution Consulting (Pty) Ltd was contracted by Eskom Holdings SOC Ltd as the independent environmental consultant to undertake the Environmental Basic Assessment process for the proposed project. Envirolution Consulting (Pty) Ltd is not a subsidiary of, or affiliated to Eskom Holdings SOC Ltd. Furthermore, Envirolution Consulting does not have any interests in secondary developments that may arise out of the authorisation of the proposed project.

### II. APPLICANT DETAILS

<b>Name of applicant:</b>	Eskom Holdings SOC Ltd
<b>Applicant representative:</b>	Mr. Aron Senyolo
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<b>EAP Registrations/ Associations</b>	Environmental Assessment Practitioners Association of South Africa (No: 2020/2574)		

#### Details of the EAP's expertise to carry out Basic Assessment procedures

The EAPs from Envirolution Consulting who are responsible for this project are (refer to **Appendix G1** for CVs):

- **Project manager:** Sheila Bolingo, the compiler of this Basic Assessment holds an Msc degree in Environmental Management with 10 years of experience in the consulting field. Her key focus areas are on strategic environmental assessment and advice on environmental impact assessments; public participation; environmental management programmes, and mapping through ArcGIS for variety of environmental projects. She is currently involved in several diverse projects across the country.
- **Project Reviewer:** Gesan Govender, the Environmental Assessment Practitioner (EAP) for the project is a registered Professional Natural Scientist and holds an Honours degree in Botany. He has over 17 years of experience within the field of environmental management. His key focus is on

strategic environmental assessment and advice; management and co-ordination of environmental projects, which includes integration of environmental studies and environmental processes into larger engineering-based projects and ensuring compliance to legislation and guidelines; compliance reporting; the identification of environmental management solutions and mitigation/risk minimising measures; and strategy and guideline development. He is currently responsible for the project management of EIA's for several diverse projects across the country.

#### IV. SPECIALIST DETAILS

The specialist studies undertaken for this application are outlined below and are attached within **Appendix E**.

Name of Specialist	Title of specialist report/ s as attached in Appendix E	Date issued
Limosella Consulting	Aquatic Biodiversity Assessment	September 2022, updated in May 2023
Dimela Eco Consulting	Terrestrial Vegetation and Plant Species Habitat Assessment	October 2022 updated in May 2023
Barbara Kasl	Non-Avian Terrestrial Fauna Assessment: Animal Species Compliance Statement & Biodiversity Assessment	September 2022; updated in May 2023
Feathers Environmental Services	Avifaunal Impact Assessment	October 2022; updated in March 2023
J.A. van Schalkwyk	Phase 1 Cultural Heritage Impact Assessment	September 2022; updated in March 2023
Prof Marion Bamford	Phase 1 Palaeontological Impact Assessment	September 2022, updated in March 2023

#### V. REQUIREMENT AND PURPOSE OF BASIC ASSESSMENT

The proposed project is subject to the requirements of the Environmental Impact Assessment Regulations (2014 EIA Regulations) in terms of the National Environmental Management Act (NEMA, Act 107 of 1998, as amended). NEMA is national legislation that provides for the authorisation of certain controlled activities known as "listed activities". In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed, and reported on to the competent authority (the decision-maker) charged by NEMA with granting of the relevant Environmental Authorisation. Eskom Holdings SOC Ltd requires an Environmental Authorisation for this project in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and listing notices GNR 327, 325 and 324 of the Environmental Impact Assessment Regulations, 2014 as amended in 07 April 2017 (GNR 326); a Basic Assessment (BA) Process is thus required for this project.

An Environmental Impact Assessment is an effective planning and decision-making tool as it provides the opportunity for the applicant to be forewarned of potential environmental issues and assess if potential environmental impacts need to be avoided, minimised or mitigated to acceptable levels. The Basic Assessment process includes certain feasibility studies for a proposed project and will inform the final design process in order to ensure that environmentally sensitive areas are avoided to an acceptable level as confirmed by the Environmental Assessment Practitioner (EAP). Comprehensive, independent

environmental studies elaborated by specialists are required in accordance with the EIA Regulations to inform the EAP of its comprehensive recommendation and provide the Competent Authority with sufficient information in order to make an informed decision. The Department of Forestry, Fisheries and the Environment (DFFE) is the Competent Authority. Eskom Holdings SOC Ltd has appointed Envirolution Consulting (Pty) Ltd, as independent environmental consultants, to undertake the Basic Assessment process and compile the Basic Assessment Report (BAR) and associated Generic Environmental Management Programme (EMPr).

### **Objectives of the Basic Assessment process**

According to Appendix 1 of the EIA Regulations of 2014 (GNR 326), the objective of the basic assessment process is to, through a consultative process –

- 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 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
- (a) through a ranking of the site sensitivities and possible impacts the activity and 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 alternative;
  - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
  - (iii) identify residual risks that need to be managed and monitored.

The main objective of the BAR and the Generic EMPr is to identify and assess potential environmental impacts associated with the proposed project, and to compile appropriate mitigation measures.

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## ABBREVIATIONS

<b>BAR</b>	Basic Assessment Report
<b>DBAR</b>	Draft Basic Assessment Report
<b>DFFE</b>	Department of Forestry, Fisheries and the Environment
<b>DWS</b>	Department of Water and Sanitation
<b>EAP</b>	Environmental Assessment Practitioner
<b>EIA</b>	Environmental Impact Assessment
<b>EMF</b>	Environmental Management Framework
<b>EMPr</b>	Environmental Management Programme
<b>FBAR</b>	Final Basic Assessment Report
<b>GN</b>	Government Notice
<b>HIA</b>	Heritage Impact Assessment
<b>I&amp;AP's</b>	Interested and Affected Parties
<b>IDP</b>	Integrated Development Plan
<b>LILO</b>	Loop in Loop Out
<b>MLM</b>	Mahikeng Local Municipality
<b>NEMA</b>	National Environmental Management Act (No. 107 of 1998) (as amended)
<b>NEMBA</b>	National Environmental Management: Biodiversity Act (No. 10 of 2004)
<b>NHRA</b>	National Heritage Resources Act (No. 25 of 1999)
<b>NMMDM</b>	Ngaka Modiri Molema District Municipality
<b>NWA</b>	National Water Act (No. 36 of 1998)
<b>NW</b>	North West Department of Economic Development, Environment, Conservation and
<b>DEDECT</b>	Tourism
<b>NWPHRA</b>	North West Provincial Heritage Resources Authority
<b>PAOI</b>	The Project Area of Influence
<b>PIA</b>	Palaeontological Impact Assessment
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SEI</b>	Site Ecological Importance
<b>SDF</b>	Spatial Development Framework
<b>SOC</b>	State Owned Company
<b>SWMP</b>	Stormwater Management Plan
<b>TOPS</b>	Threatened or Protected Species
<b>WMA</b>	Water Management Area
<b>WULA</b>	Water Use License Application

## 1. INTRODUCTION

### 1.1 Project Background

Envirolution Consulting (Pty) Ltd was appointed by Eskom Holdings SOC Limited (hereafter referred to as Eskom) to conduct the Basic Assessment (BA) Process for the proposed development of the Dihatshwane 2x20MVA 88/11kV Substation and the associated Loop In Loop Out (LILO) powerline which connects to the existing powerline in Rooigrond, Mahikeng Local Municipality, Ngaka Modiri Molema District Municipality, North West Province.

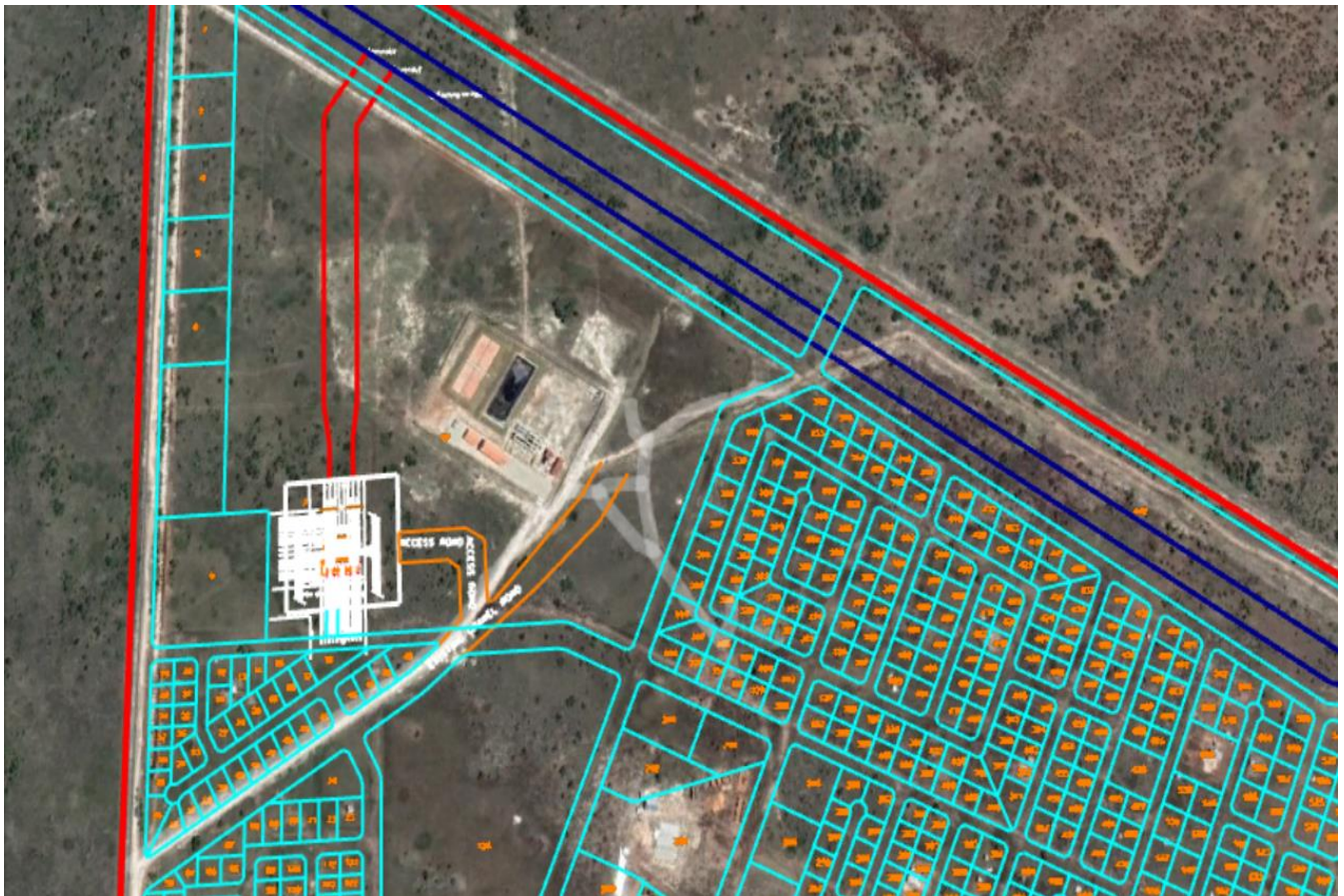
Eskom Holdings is the biggest producer of electricity in South Africa and is a vertically integrated company licensed to generate, transmit and distribute electricity. A distribution operation constructs and maintains equipment that transforms the power supply to the type that meets the customer's needs. Reliable network performance targets necessitate that Eskom Distribution improves present distribution network performance levels.

The following issues have been identified:

- Currently the Rooigrond 1x5MVA 88/11kV transformer is over 80% utilized, at 4.3MVA.
- Rooigrond Fiscoek 11kV feeder is the closest feeder to the point of connection but it does not have capacity to connect 3000 households.
  - The Minimum Voltage of the feeder is 93%
  - The thermal loading of the feeder is 73.3%
- Rooigrond 1x5MVA 88/11kV substation cannot handle the 14MVA requested by Mahikeng Local Municipality for the development at Rooigrond.
- Rooigrond 1x5MVA 88/11kV Substation is loaded at 4.3MVA.
- Mahikeng Main Majemantsho 11kV is the alternative feeder to connect these 3000 households but it also does not have capacity.
  - The Minimum Voltage of the feeder is 85%
  - The thermal loading of the feeder is 96%

The Mahikeng Local Municipality submitted application for the electrification of Rooigrond settlement, as part of the municipal developments planned to take place in the area, the developments include formalising of the village and building new houses which include schools, clinic and businesses, etc. this is shown in **Figure 1..**

Eskom is unable to supply the required electricity capacity from the the existing Rooigrond Substation. In order to meet the demand, It is for these reasons that Eskom has proposed to develop the new Dihatshwane Substation along with associated infrastructure.



**Figure 1:** Rooigrond settlement, as part of the municipal developments planned

**1.2 Locality of study site**

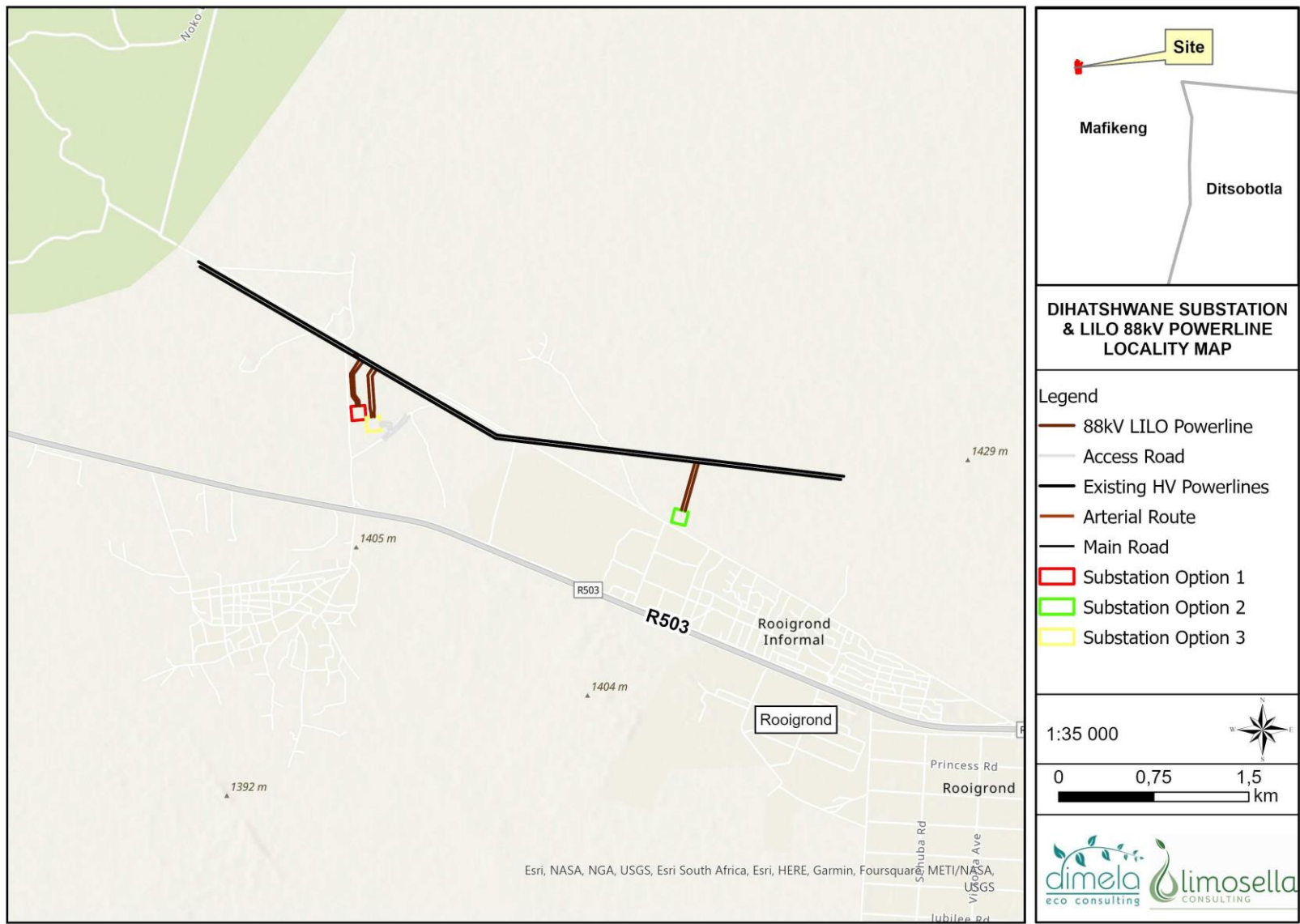
The substation options are all located north of the R503, in Dihatshwane, to the east of Mahikeng. The Rooigrond settlement lies to the east of the substations, as depicted in **Figure 2**. Both sites fall within the Mahikeng Local Municipality in the Ngaka Modiri Molema District Municipality of the North West Province. The coordinates and property details for both options are outlined in **Table 1** below.

**Table 1: Coordinates and Property Details**

Substation Option	Coordinates (centre)	Property Details	21 Digit Code	Size
Substation <b>Option 1</b>	25°53'41.09"S; 25°45'29.05"E	Rooigrond 135, Portion 2, JO	T0JO0000000001350000	10 000 m <sup>2</sup>
Substation <b>Option 2</b>	25°54'4.72"S; 25°46'50.37"E	BAUWEL 128, Portion 5, JO	T0JO0000000001280005	10 000 m <sup>2</sup>
Substation <b>Option 3</b>	25°53'43.82"S; 25°45'32.58"E	Rooigrond 135, Portion 2, JO	T0JO0000000001350000	10 000 m <sup>2</sup>

Loop-In-Loop-Out Powerline	Coordinates loop in point	Property Details	21 Digit Code	Length & servitude
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Option 1	<b>Start</b> 25°53'39.57"S; 25°45'28.39"E <b>End:</b> 25°53'29.06"S; 25°45'29.46"E	Rooigrond 135, Portion 2, JO	T0JO00000000013500000	380m, 31m servitude
Option 2	<b>Start</b> 25°54'3.73"S; 25°46'51.44"E <b>End:</b> 25°53'52.54"S; 25°46'55.02"E	BAUWEL 128, Portion 5, JO	T0JO00000000012800005	770m; 31m servitude
Option 3	<b>Start</b> 25°53'41.91"S; 25°45'32.37"E <b>End:</b> 25°53'30.80"S; 25°45'32.86"E	Rooigrond 135, Portion 2, JO	T0JO00000000013500000	362m; 31m servitude

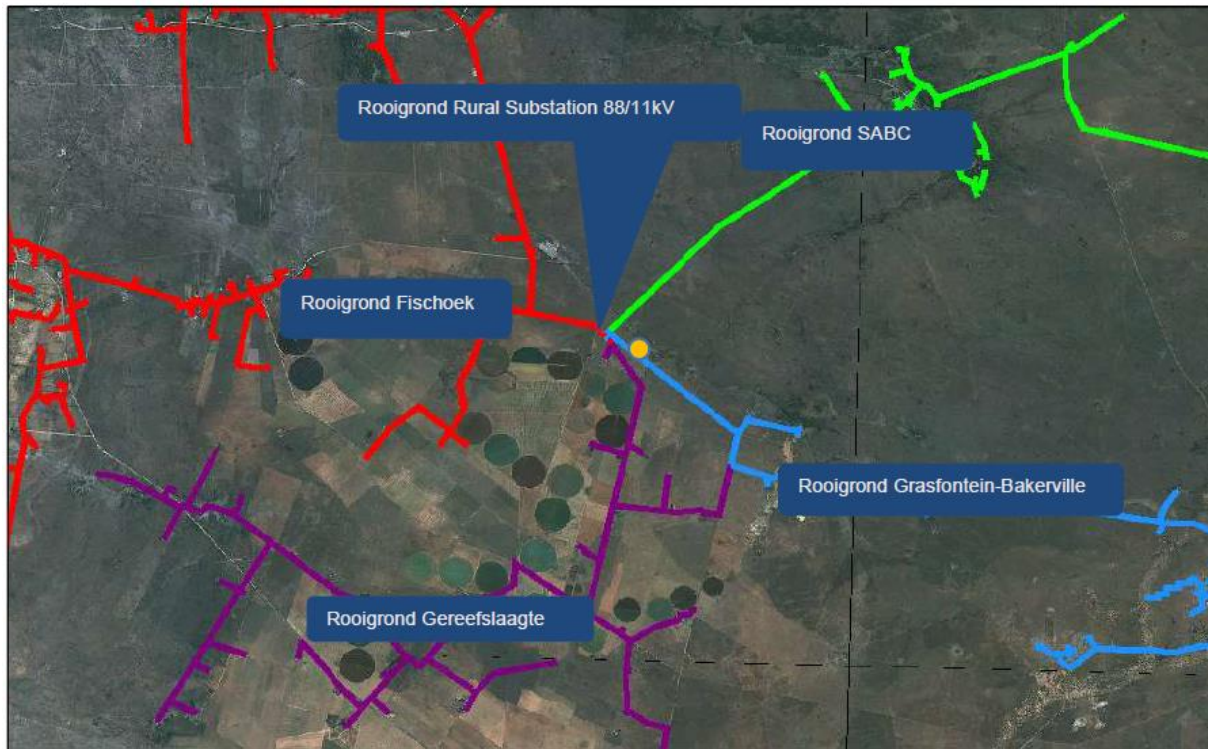


**Figure 2: Locality Map**



### 1.3 Existing Network Analysis

Rooigrond rural 1x5MVA 88/11kV substation is supplied from Watershed MTS network via a 4.7km 88kV Chickadee line from Slurry/Rooigrond Tee. The Rooigrond 88/11kV substation is equipped with 1x5MVA 88/11kV transformer, which supplies four 11kV rural feeders (Fischoek 11kV, Greefslaagte 11kV, Grasfontein-Bakerville 11kV and Rooigrond SABC 11kV). This is depicted in **Figure 3** below.



**Figure 3:** Geographical layout showing Rooigrond Rural 1x5MVA 88/11kV Substation and its feeders

## 2. PROJECT DESCRIPTION

### 2.1 Description of Proposed Activity

Three alternative locations have been proposed for the proposed substation. The substation will cover an area of 100mx100m, to be equipped with 2x20MVA transformers. The 88kV incoming line of approximately 350m will enter the proposed new substation at the approved safety height and will terminate into a Bus Coupler, a Corridor of 100m in width was assessed for each alternative.

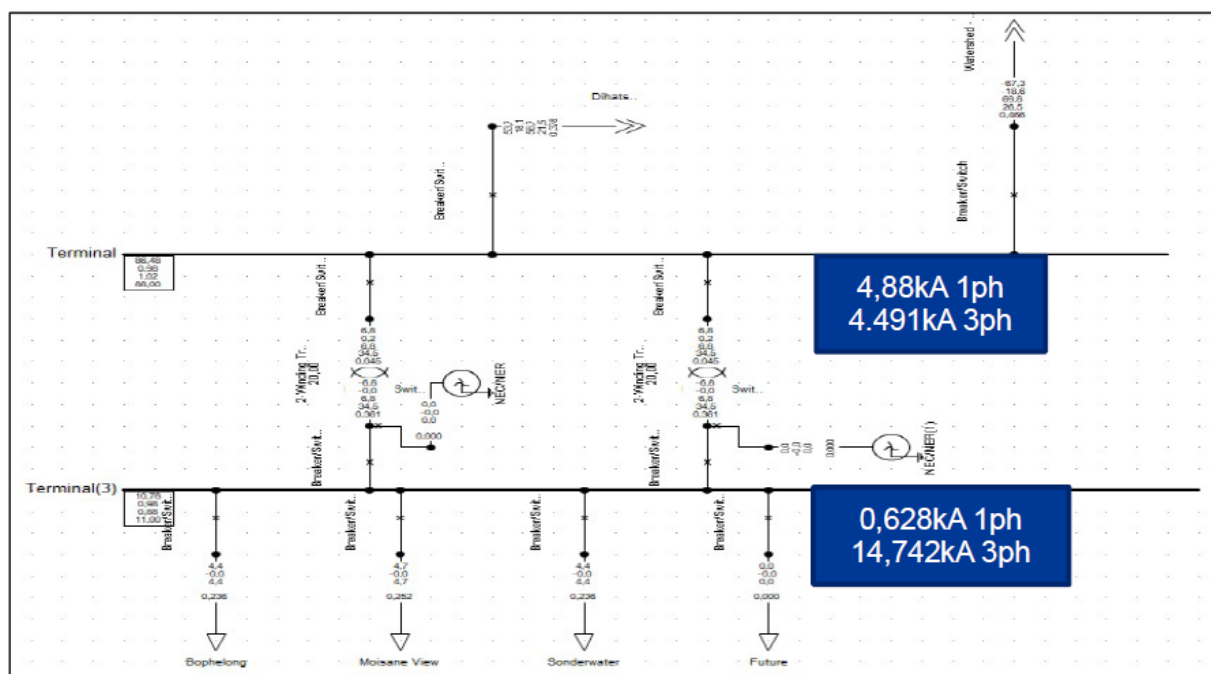


Images of a typical substation Layout and an 88kV Powerline.

### 2.2 Scope of Work

- Create a Loop In Loop Out (LILO) on the Watershed/Mmabatho bulk 88kV line
- Build 2x0.6km 88kV chickadee line from Watershed/Mmabatho bulk1 88kV line
- Erect 2x88kV line bays at the new Dihatshwane 88/11kV substation site
- Install 2x20MVA 88/11kV transformer at Dihatshwane substation (The 1x20MVA 88/11kV transformer is needed for N-1 contingency(cost to Eskom)
- Install 4x11kV feeder bays and only equip 3 leaving 1 for future
- Build a fully equipped control room

**Figure 4** depicts the Schematic Layout Plan for the Dihatshwane 88/11kV 2x20MVA Substation electric diagram.



**Figure 4:** Dihatshwane Substation Electric Diagram

### 2.3 Alternatives

Eskom has considered two site options for the proposed substations, as follows:

- **Substation Option 1 (or A)** – This is located at the most western locality and borders the Mahikeng Game Reserve. A dirt road forms the western boundary of the Substation Option 1 site. The distribution powerline to which the LILO will connect is about 380 meters north of Substation Option 1. The approximate development footprint of this option is 10 000m<sup>2</sup>. This is depicted in **Figure 5**.
- **Substation Option 2 (or B)** – This is situated 2.2km to the south-east of Substation Option 1. A dirt road forms the southern boundary of the site as well as a residential area. The distribution powerline to which the LILO powerline will connect is about 770 meters north of Substation Option 2. The approximate development footprint of this option is 10 000m<sup>2</sup>. This is depicted in **Figure 6**.
- **Substation Option 3 (or C)** – This is located between Option 1 and 2. A dirt road forms the eastern boundary of the Substation Option 3 site. The distribution powerline to which the LILO will connect is about 362 meters north of Substation Option 3. The approximate development footprint of this option is 10 000m<sup>2</sup>. This is depicted in **Figure 7**.

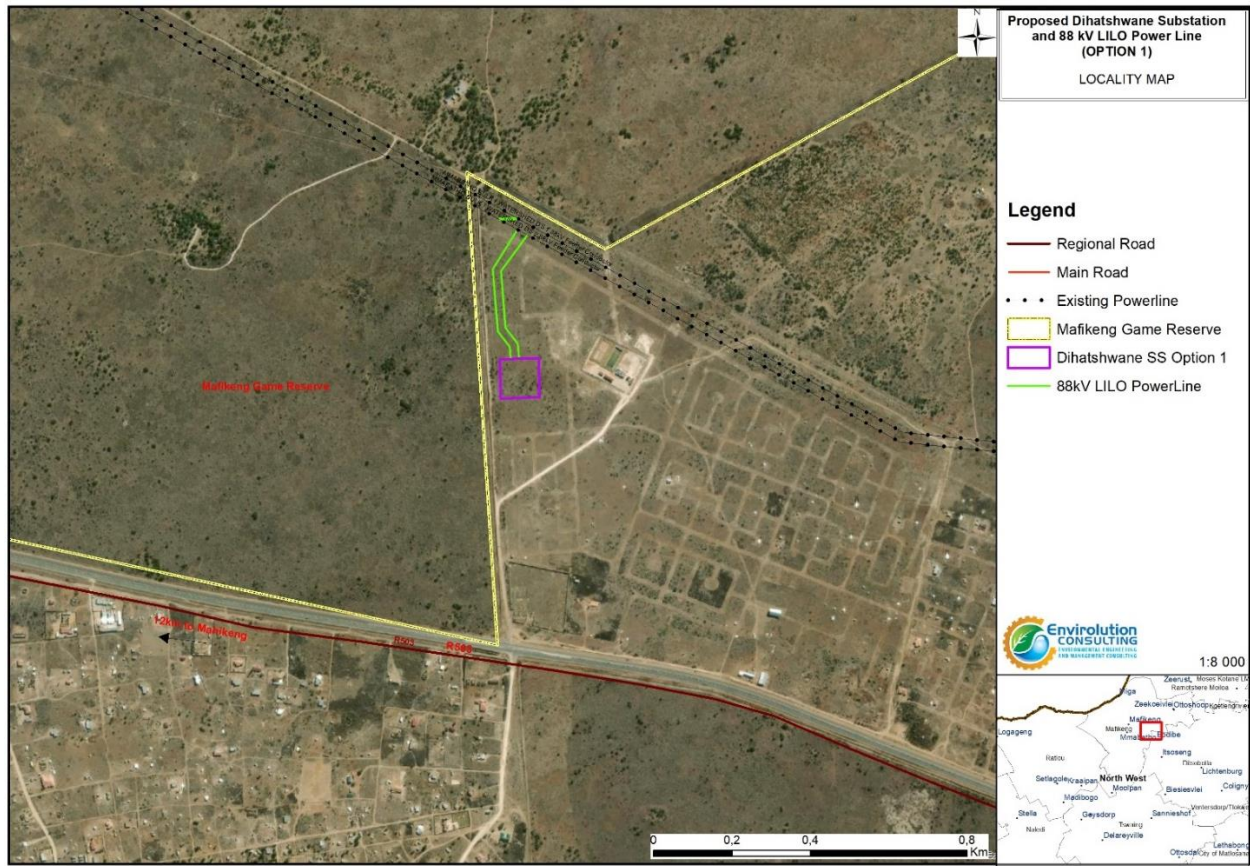


Figure 5: Substation Option 1

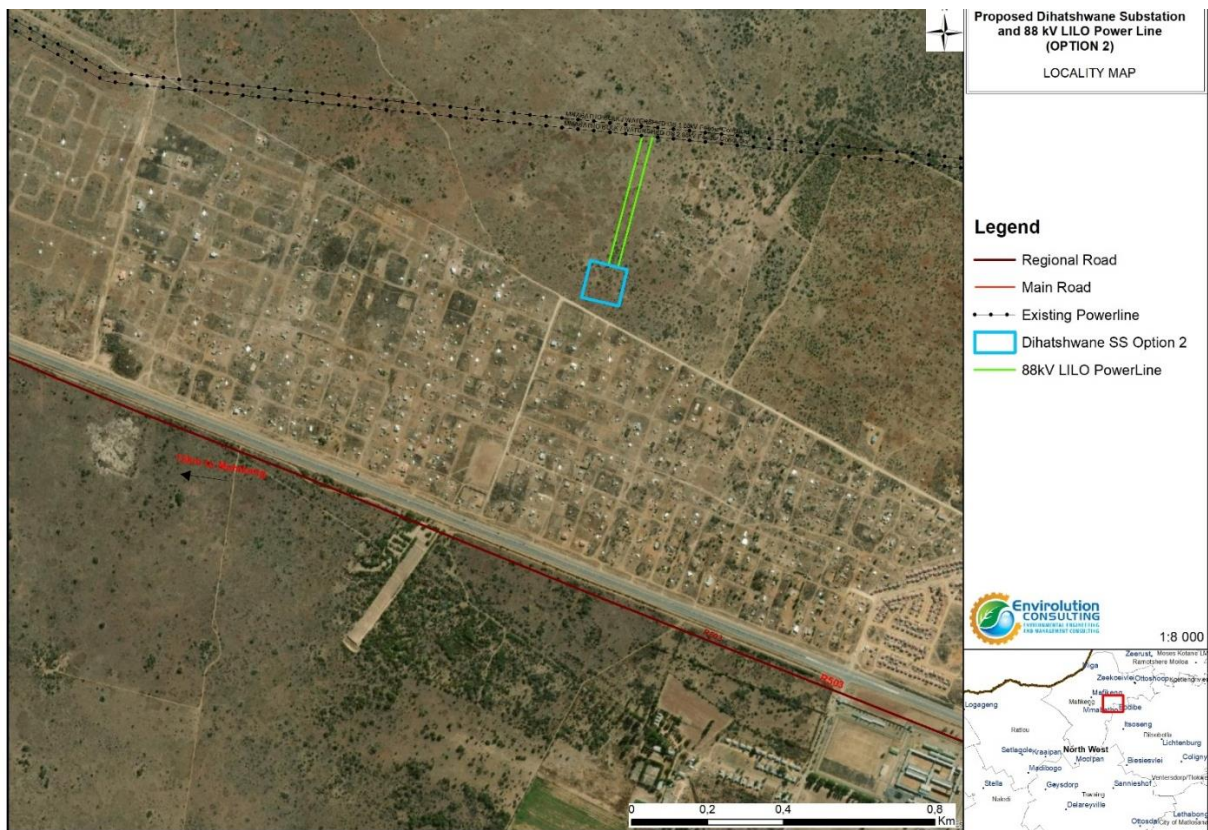


Figure 6: Substation Option 2

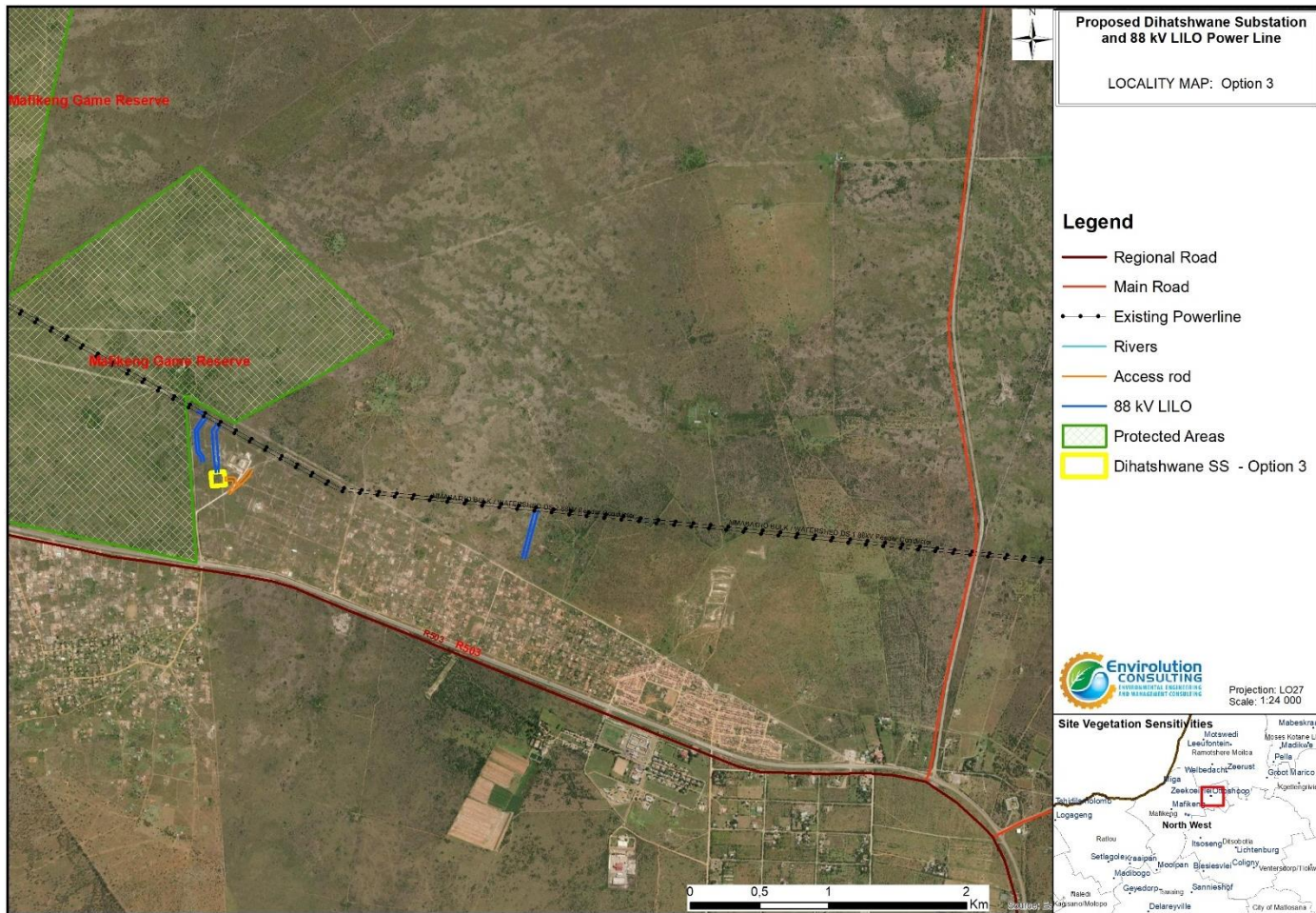


Figure 7: Substation Option 3

## 2.4 Need and Desirability

### 2.4.1 The Need for the Project at a Regional level

The North-West Provincial Development Plan (2011) indicates Despite improvements in access to piped water and electricity, a very large part of the population lives in informal and non-serviced settlements and average household income in the North West remain below the national average. Approximately 16 per cent of the provincial population does not have access to electricity for lighting, a challenge that is of particular concern in rural areas, where large numbers of households are dependent on paraffin and candles for lighting. In the North West province, similar to the rest of South-Africa, energy supply is dominated by non-renewable sources and pollution, environmental degradation and climate change remain concerns. The focus in the North West province over the following two decades will therefore be to extend availability of electricity to rural excluded populations and to expand its renewable energy infrastructure and value chain.

### 2.4.2 The Need for the Project at a Local level:

This is an electrification project to electrify an informal settlement on the edge of the Rooigrond supply area. The Mahikeng Local Municipality, under which these informal settlements fall, submitted the electrification connections request to Eskom. The Rooigrond 1x5MVA 88/11kV substation is the closest to the point of connection. However, the 1x5MVA 88/11kV transformer at the substation is over 80% utilized. The Rooigrond 1x5MVA 88/11kV substation has four 11kV feeders namely: SABC11kV;

Greefslaagte11kV; Bakerville11kV and Fiscoek11kV, which is geographically close to the planned point of connection.

The expected 3000 electrification load will add 3.2MVA to the feeder. Integration of Mosiane View and Dihatshwane villages is approximately 4000 connections with the required load of 6.7 MVA Rooigrond Development (Residential part) has approximately 3846 connections with the required load of 8MVA. The expected 7846 electrification load will add 14.7 MVA to the nearest feeder. The proposed development in the Rooigrond area will require a supply of 14MVA that will be including residential units, commercial, light industrial and community facilities.

### **2.4.3 The Desirability of the Project**

- The project is desired to solve the capacity issues at Rooigrond in-line with Municipal developments in the area (Refer to the municipal layout design for the area).
- The need for the people in the area and surrounding villages to have access to basic electricity.
- The Mahikeng Local Municipality have agreed to allocate site to Eskom due to the development in this location.
- The accessibility to the nearby 88kV High Voltage Line of which is the only high voltage line in the vicinity. The High Voltage is the main supply line to the Substation.
- The preferred options 1 and 3 will make it more technically viable to evacuate more Medium Voltage reticulation lines because this side is still under development phase (no houses built yet).
- Option 2 will allow to evacuate limited Medium Voltage reticulation lines because substation will be boxed behind the village. The substation will not be fully utilised.
- It will be technically viable to download nearby Eskom lines so that larger community can be benefit from the proposed substation.
- The location will be more accessible for the maintenance of the substation because of nearby N18 road.

Refer to Figure 1 showing the Rooigrond Settlement as part of the municipal developments planned

### 3. GOVERNANCE FRAMEWORK AND ENVIRONMENTAL PROCESS

All legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA Regulations are discussed below.

#### 3.1 Listed Activities for Basic Assessment Process

In terms of sections 24(2) and 24D of the National Environmental Management Act (Act No. 107 of 1998), as amended and listing notices GNR 327, 325 and 324 of the Environmental Impact Assessment Regulations, 2014 as amended in 07 April 2017 (GNR 326), a Basic Assessment process is required for the proposed project. **Table 2** below contains the listed activities in terms of the EIA Regulations and includes a description of those project activities which relate to the applicable listed activities.

**Table 2: Listed Activities**

Listed activities	Description of project activity that triggers listed activity
<p><b>Listing Notice 1 (GNR 327, 07 April 2017), Activity 11</b></p> <p>The development of facilities or infrastructure for the transmission and distribution of electricity—</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.</p> <p><i>Excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is —</i></p> <p><i>(a) temporarily required to allow for maintenance of existing infrastructure;</i></p> <p><i>(b) 2 kilometres or shorter in length;</i></p> <p><i>(c) within an existing transmission line servitude; and</i></p> <p><i>(d) will be removed within 18 months of the commencement of development.</i></p>	<p>The proposed 2x20mV substation of approx. 10 000m<sup>2</sup> and 88kV loop in loop out powerline with a servitude of 31m located outside of an urban area.</p>
<p><b>Listing Notice 1 (GNR 324, 07 April 2017), Activity 27</b></p> <p>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—</p> <p>(i) the undertaking of a linear activity; or</p> <p><b>(ii)</b> maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>The clearance of indigenous vegetation for an area of 10 000 m<sup>2</sup> for the Substation is expected to be cleared.</p>

<p><b>Listing Notice 3 (GNR 324, 07 April 2017), Activity 12</b></p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>h. North West</p> <p>iv. Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority.</p>	<p>The area is located within a CBA area. More than 300m<sup>2</sup> (i.e. 10 000 m<sup>2</sup>) of vegetation within the CBA area is expected to be cleared.</p>
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The above listed activities have triggered a Basic Assessment Process, these activities may not commence without an Environmental Authorisation from the Competent Authority. The aim of the Environmental Impact Assessment is to ensure that:

- The potential environmental impacts and risks associated with the proposed project are taken into consideration;
- Public Participation Process is conducted in line with EIA Regulations (i.e. to afford any Interested and or Affected parties (I&AP) sufficient opportunity to provide comments); and
- Sufficient information is provided to decision makers in order to ensure an informed decision-making.

This report has been compiled in accordance with the requirements of the EIA Regulations of 2014, as amended, and includes details of the activity description; the site, area and property description; the public participation process; the impact assessment; and the recommendations of the Environmental Assessment Practitioner.



### 3.2 Legislation and Guidelines that have informed the preparation of this EIA Report

Several other Acts, Standards or Guidelines have also informed the project process and the scope of issues assessed in this report. A listing of relevant legislation is provided in **Table 3** below, where the level of applicability of the legislation or policy to the activity/project is detailed.

**Table 3: Applicable Legislation, Policies and/or Guidelines**

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
Constitution of the Republic of South Africa (Act No. 106 of 1996)	<p>The Constitution is the supreme Law in South Africa. Chapter 2 of the Constitution contains the Bill of Rights including section 24 which provides that:</p> <p>"Everyone has the right-</p> <ul style="list-style-type: none"> <li>(a) to an environment that is not harmful to their health or well-being; and</li> <li>(b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that- <ul style="list-style-type: none"> <li>(i) prevent pollution and ecological degradation;</li> <li>(ii) promote conservation; and</li> <li>(iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development."</li> </ul> </li> </ul> <p>Other rights protected by the Constitution relevant to environmental authorisations include the right to administrative justice and to information, and rights, known as "socio-economic rights", such as access to clean air. The right to administrative justice is relevant to application and awarding of environmental authorisations because decisions made by the competent authority in the course of the environmental assessment process (such as the decision to accept a basic assessment report) as well as a final decision on the application fall into the definition of "administrative action". The construction phase of the Project would need to take these principles into account.</p>	South African Government	While no permitting or licensing requirements arise directly, this paves the way for the National Environmental Management Act which is considered the overarching framework for Environmental Impact Assessments thus takes applicability there.
National Environmental Management Act (Act No. 107 of 1998)	<p>NEMA requires, inter alia, that:</p> <ul style="list-style-type: none"> <li>• Development must be socially, environmentally, and economically sustainable.</li> </ul>	National Department of Forestry, Fisheries and the Environment (DFFE)	The Basic Assessment is undertaken in accordance with the requirements of the Environmental Impact Assessment Regulations of 2014, as amended, and as required in terms of the

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<ul style="list-style-type: none"> <li>Disturbance of ecosystems and loss of biological diversity are avoided, or, where they cannot be altogether avoided, are minimised and remedied.</li> <li>A risk-averse and cautious approach is applied, which takes into account the limits of current knowledge about the consequences of decisions and actions.</li> </ul> <p>EIA Regulations have been promulgated in terms of Chapter 5. Activities which may not commence without an environmental authorisation are identified within these Regulations. In terms of S24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported on to the competent authority charged by NEMA with granting of the relevant environmental authorisation.</p>	North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT)	National Environmental Management, 1998 (Act No. 107 of 1998).
National Environmental Management Act (Act No. 107 of 1998)	A project proponent is required to consider a project holistically and to consider the cumulative effect of potential impacts. In terms of the Duty of Care provision in S28(1) the project proponent must ensure that reasonable measures are taken throughout the life cycle of this project to ensure that any pollution or degradation of the environment associated with a project is avoided, stopped or minimised.	National Department of Forestry, Fisheries and the Environment (DFFE) North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT)	While no permitting or licensing requirements arise directly, the holistic consideration of the potential impacts of the proposed project has found application in the impact assessment phase. The implementation of mitigation measures is included as part of the Project EMPr and will continue to apply throughout the life cycle of the project.
National Water Act (Act No. 36 of 1998)	Section 21 water uses as per the NWA includes: 21(a): Taking water from a water resource; 21(b): Storing water; 21(c): Impeding or diverting the flow of water in a watercourse; 21(d): Engaging in a stream flow reduction activity; 21(e): Engaging in a controlled activity; 21(f): Discharging waste or water containing waste into a water resource through a pipe, canal, sewer or other conduit; 21(g): Disposing of waste in a manner which may detrimentally impact on a water resource;	Department of Water and Sanitation (DWS)	The preferred site of the proposed development does not require a Water Use License as it is not within 500m of a wetland or 100m of a river so it does not trigger Section 21 c and i, or any water use of the NWA. DWS will however be kept as an I&AP on the projects database.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<p>21(h): Disposing in any manner of water which contains waste from, or which has been heated in any industrial or power generation process;</p> <p>21(i): Altering the bed, banks, course or characteristics of a watercourse;</p> <p>21(j): Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and</p> <p>21(k): Using water for recreational purposes.</p> <p>For wetland areas, development within a 500m buffer triggers the act. For rivers, development within a 100m buffer triggers the act. Any activity that triggers any of the above water uses will require a Water Use License.</p> <p>Given the sensitivity associated with a project, DWS will determine whether the project will follow a General Authorisation process or a Water Use License Application process.</p>		
<p>National Environmental Management: Biodiversity Act 2004 (Act No. 10 of 2004)</p>	<p>This Act provides management and conservation of South Africa’s biodiversity within the framework of the National Environmental Management Act (Act No. 107 of 1998); the protection of species and ecosystems that warrant national protection and the sustainable use of indigenous biological resources.</p>	<p>National Department of Forestry, Fisheries and the Environment (DFFE)</p>	<p>While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project in proper management of the development of the substation and associated infrastructure to prevent soil contamination.</p>
<p>National Environmental Management: Waste Act (Act No. 59 of 2008)</p>	<p>The NEMA: WA came into effect on the on 1st July 2009. Section 20 of the Environment Conservation Act (Act No. 73 of 1989), under which waste management was previously governed, was repealed. In general, the act seeks to ensure that people are aware of the impact of waste on their health wellbeing and the environment, and in the process giving effect to Section 24 of the constitution, in ensuring an environment that is not harmful to health and wellbeing.</p>	<p>National Department of Forestry, Fisheries and the Environment (DFFE) National Department of Forestry, Fisheries and the Environment (DFFE) – lead authority for regulating hazardous waste. North West Department of Economic</p>	<p>No waste license activities are applicable to this project. The developer will however be required to store and manage waste in accordance with the requirements of this Act and associated Standards.</p>

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
		Development, Environment, Conservation and Tourism (NW DEDECT) – for regulating general waste	
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Section 18, 19 and 20 of the Act allow certain areas to be declared and managed as “priority areas”. The Act provides that an air quality officer may require any person to submit an atmospheric impact report if there is reasonable suspicion that the person has failed to comply with the Act. Dust Control Regulation Control Regulations, R. No. 827 of 1 November 2013.	National Department of Forestry, Fisheries and the Environment (DFFE)	While no permitting or licensing requirements arise from this legislation for the site, this Act will find application during the construction phase of the project. The implementation of dust mitigation measures are included as part of the project EMPr and will continue to apply throughout the life cycle of the project. Dust control regulations promulgated in November 2013 may require the implementation of a dust management plan.
National Heritage Resource Act, 1999 (Act No. 25 of 1999)	Section 38 states that Heritage Impact Assessments (HIAs) are required for certain kinds of development including the construction of a road, exceeding 300m in length. In accordance with the NHRA, an independent heritage consultant is to conduct a cultural heritage assessment to determine any impact on any sites, features or objects of cultural heritage significance. If none are identified, any archaeological sites or graves to be exposed during construction work must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. If a permit is required as per section 34 of the NHRA, no works are to commence before the permit is obtained.	South African Heritage Resources Association (SAHRA) North West Provincial Heritage Resources Authority (NWPHRA)	Should any heritage/ palaeontology sites/ artefacts be unearthed during excavations, a permit would be required to be obtained from SAHRA.
National Energy Act (Act No. 34 of 2008)	The purpose of the National Energy Act is to ensure that diverse energy resources are available, in sustainable quantities and at affordable prices, to the South African economy in support of economic growth and poverty alleviation; while taking environmental management requirements into account. In	National Department of Forestry, Fisheries and the Environment (DFFE)	This act is applicable throughout the life cycle of the proposed project.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<p>addition, the Act also provides for energy planning, and increased generation and consumption of energy.</p> <p>The objectives of the Act, are to amongst other things, to:</p> <ul style="list-style-type: none"> <li>• Ensure uninterrupted supply of energy to the Republic.</li> <li>• Promote diversity of supply of energy and its sources.</li> <li>• Facilitate energy access for improvement of the quality of life of the people of the Republic.</li> <li>• Contribute to the sustainable development of South Africa's economy.</li> </ul> <p>The National Energy Act therefore recognises the significant role which electricity plays growing the economy while improving citizens' quality of life.</p>	Department of Mineral Resources and Energy (DMRE)	
Promotion of Access to Information Act, 2000 (Act No. 2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	National Department of Forestry, Fisheries and the Environment (DFFE)	No permitting is required. The act finds applicability during the public participation process phase of the Basic Assessment process.
Occupational Health and Safety Act (Act No. 85 of 1993)	The Occupational Health and Safety Act provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work, against hazards to health and safety arising out of or in connection with the activities of persons at work.	Department of Labour (DoL)	While no permitting or licensing requirements arise from this legislation, this Act will find application during the construction phase of the project. Health and safety precautions measures must be put in place for the construction crew and the general public. E.g. Protection of workers on site through provision of Personal Protective Equipment's; Training and other health and safety amenities.
Hazardous Substances Act (Act No. 15 of 1973)	This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitizing, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.	Department of Health (DoH)	It is necessary to identify and list all the Group I, II, III, and IV hazardous substances that may be on the site and in what operational context they are used, stored or handled.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<ul style="list-style-type: none"> <li>Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance;</li> <li>Group IV: any electronic product;</li> <li>Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.</li> </ul>		
National Road Traffic Act (Act No. 93 of 1996)	<p>The technical recommendations for highways (TRH 11): "Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads" outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.</p> <p>Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.</p> <p>The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.</p> <p>An abnormal load/vehicle permit may be required to transport the various components to site for construction. These include:</p> <ul style="list-style-type: none"> <li>Route clearances and permits will be required for vehicles carrying abnormally heavy or abnormally dimensioned loads.</li> <li>Transport vehicles exceeding the dimensional limitations (length) of 22m.</li> </ul>	South National Agency (SANRAL) Provincial Department of Transport	African Roads Limited of This act is applicable during the construction phase of the project when material is being transported to and from the site.

Title of legislation, policy or guideline (Promulgation Date)	Applicable Requirements	Administering Authority	Description of compliance
	<ul style="list-style-type: none"> <li>Depending on the trailer configuration and height when loaded, some of the power station components may not meet specified dimensional limitations (height and width).</li> </ul>		
<p><b>Policy Guidelines</b> The following Guideline documents have been considered in the preparation of this report:</p> <ul style="list-style-type: none"> <li>Department of Environmental Affairs (DEA) Integrated Environmental Management Guideline Series 7, Public Participation in the EIA Process as published in Government Gazette No. 33308, 18 June 2010;</li> <li>Implementation Guidelines (published for comment) in Government Notice 603 of 2010</li> <li>Integrated Environmental Management Information Series (Booklets 0 to 23) (DEAT, 2002 – 2005);</li> <li>Guidelines for Involving Specialists in the EIA Processes Series (DEA&amp;DP; CSIR and Tony Barbour, 2005 – 2007)</li> <li>DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7.</li> </ul>			
<p><b>Other applicable guidelines include the following:</b></p> <ul style="list-style-type: none"> <li>Integrated Energy Plan (IEP), 2016</li> <li>Integrated Resource Plan for Electricity (2010-2030)</li> <li>National Development Plan 2030 (2012)</li> <li>National Infrastructure Plan</li> </ul>			

### 3.3 Summary of The Requirements of Appendix 1 Of The 2014 NEMA EIA Regulations

Table 4 below details how the legal requirements of **APPENDIX 1** of the 2014 EIA Regulations (**as amended, GNR326**) have been addressed within this report.

**Table 4:** Legal requirements in terms of the 2014 EIA regulations

Appendix 1: CONTENT OF BASIC ASSESSMENT REPORTS	Cross-reference in this BAR report
<b>Scope of assessment and content of basic assessment reports</b>	
3. (1) A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and must include—	Appendix G1
(a) details of—	
(i) the EAP who prepared the report; and	
(ii) the expertise of the EAP, including a curriculum vitae;	
(b) the location of the activity, including:	Appendix G3
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;	
(c) a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;	Appendix A & Appendix G3
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;	
(d) a description of the scope of the proposed activity, including—	Section 3.1 Section 2.2
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;	
(e) a description of the policy and legislative context within which the development is proposed including—	Section 3.2
iii. 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	
iv. how the proposed activity complies with and responds to the legislation and policy context, plans, guidelines, tools frameworks, and instruments;	
(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 2.3
(g) a motivation for the preferred site, activity and technology alternative;	Section 2.3)
(h) a full description of the process followed to reach the proposed preferred alternative within the site, including—	i. Section 2.4
i. details of all the alternatives considered;	ii. Chapter 4 & Appendix D
ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	iii. Appendix D: Public Participation Process
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;	iv. Chapter 5
iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	v. Chapter 6
	vi. Chapter 7
	vii. Chapter 7
	viii. Chapter 7
	ix. Chapter 7
	x. Section 2.4
	xi. Section 8.4



<ul style="list-style-type: none"> <li>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— <ul style="list-style-type: none"> <li>(aa) can be reversed;</li> <li>(bb) may cause irreplaceable loss of resources; and</li> <li>(cc) can be avoided, managed or mitigated;</li> </ul> </li> <li>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;</li> <li>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;</li> <li>viii. the possible mitigation measures that could be applied and level of residual risk;</li> <li>ix. the outcome of the site selection matrix;</li> <li>x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and</li> <li>xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity;</li> </ul>	
<ul style="list-style-type: none"> <li>(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— <ul style="list-style-type: none"> <li>(i) a description of all environmental issues and risks that were identified during the environmental impact assessment process; and</li> <li>(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;</li> </ul> </li> </ul>	Chapter 7
<ul style="list-style-type: none"> <li>(j) an assessment of each identified potentially significant impact and risk, including— <ul style="list-style-type: none"> <li>(i) cumulative impacts;</li> <li>(ii) the nature, significance and consequences of the impact and risk;</li> <li>(iii) the extent and duration of the impact and risk;</li> <li>(iv) the probability of the impact and risk occurring;</li> <li>(v) the degree to which the impact and risk can be reversed;</li> <li>(vi) the degree to which the impact and risk may cause irreplaceable loss of resources; and</li> <li>(vii) the degree to which the impact and risk can be avoided, managed or mitigated;</li> </ul> </li> </ul>	Chapter 7
<ul style="list-style-type: none"> <li>(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;</li> </ul>	Chapter 8 (section 8.1)
<ul style="list-style-type: none"> <li>(l) an environmental impact statement which contains— <ul style="list-style-type: none"> <li>(i) a summary of the key findings of the environmental impact assessment;</li> <li>(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</li> <li>(iii) a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;</li> </ul> </li> </ul>	Chapter 8 (section 8.4)
<ul style="list-style-type: none"> <li>(m) based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management outcomes for the development for inclusion in the EMPr;</li> </ul>	Appendix E
<ul style="list-style-type: none"> <li>(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;</li> </ul>	Chapter 8
<ul style="list-style-type: none"> <li>(o) a description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed;</li> </ul>	Chapter 6 (Section 6.7)

<b>(p)</b> 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;	Chapter 8 (Section 8.4)
<b>(q)</b> 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;	N/A
<b>(r)</b> an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the reports; (ii) the inclusion of comments and inputs from stakeholders and I&APs; (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; and	Appendix G1
<b>(s)</b> where applicable, details of any financial provision for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	N/A
<b>(t)</b> any specific information that may be required by the competent authority <sup>1</sup> ; and	N/A
<b>(u)</b> any other matters required in terms of section 24(4)(a) and (b) of the Act.	N/A
<b>(2)</b> Where a government notice <i>gazetted</i> by the Minister provides for the basic assessment process to be followed, the requirements as indicated in such a notice will apply	N/A

## 4. PUBLIC PARTICIPATION PROCESS

### 4.1 Aim of the Public Participation Process

The aim of the Public Participation Process is to allow Interested and Affected Parties (I&APs) the opportunity to gain an understanding of the project and consider all facets of the proposed activities. The Public Participation Process will:

- Provide I&APs with information about the proposed substation and LILO development activities and associated potential impacts;
- Allow I&APs the opportunity to provide input, such as concerns or queries, on the proposed project; and
- Incorporate the input raised by I&APs in the study and ultimate decision-making process.

### 4.2 The following activities will take place during the public participation process:

- **Identification of Key Stakeholders**

As required by the EIA Regulations of 2014, relevant local, provincial and national authorities, local forums and representatives as well as surrounding land owners and occupants must be notified of the environmental process during the initial application. Refer to **Appendix E2** for written notification wording. Proof of this notification will be included in the Final Basic Assessment Report (FBAR).

Relevant government authorities (organs of state) have been automatically registered as IAPs. In accordance with the EIA Regulations of 2014, all other persons must request in writing to be placed on the register, submit written comments or attend meetings in order to be registered as stakeholders and included in future communication regarding the project; the advertisement and notifications advise that IAPs register as such. All respondents are then to be placed on the project database. This database is supplemented by IAPs who contacts the project manager to be included on the database. The database is used throughout the process to inform the stakeholders of the project. The stakeholder database will be updated throughout the process. Refer to **Appendix E4** for the I&AP database.

- **Newspaper Advertisement**

An advertisement, notifying the public of the availability of the Draft Basic Assessment process and/ or requesting I&APs to register with, and/ or submit their comments to Envirolution Consulting (Pty) Ltd will run in the local newspaper on 18 May 2023. Refer to **Appendix E3** for newspaper advertisement wording.

- **Site notices**

Four site notices will be erected on site and at visible and accessible locations close to both the site options in order to inform surrounding communities and immediately adjacent landowners of the proposed development and the availability of the DBAR for a 30-day public review period for commenting purposes. Refer to **Appendix E1** for site notice wording. Proof by means of photographic evidence of the site notices will be included in the DBAR.

- **SAHRIS Upload**

The project details will also be uploaded onto the SAHRIS portal on 18 May 2023 which will allow for more awareness as well as more I&AP participation. Proof hereof will be included in the FBAR.

- **Direct notification of identified I&APs**

Identified I&AP's, including key stakeholders representing the sectors outlined below, will be directly notified of the proposed development by e-mail on 18 May 2023.

- Provincial Authorities
- Local Authorities
- Service providers
- Ward Councillors

Please refer to **Appendix E2** for the Notification Letters. Proof of email notifications that will be distributed to I&AP's will be included in the FBAR.

- **Hand-deliveries/ knock and drops**

Hand-deliveries of notification letters will be made to landowners and adjacent landowners on 18 May 2023, to notify and inform them of the proposed project. Proof of the Knock and Drop register will be included in the FBAR.

- **Availability of Draft Basic Assessment Report for public review**

The DBAR will be released for a 30-day public review period from **25 May 2023 until 26 June 2023**. Organs of state, I&AP's and stakeholders will be notified by email and/ or post of the availability of the report along with all appendices including the EMPr and specialist studies for public review and comment. An online system is used to submit applications and the BAR to DFFE as the Competent Authority; this will be done accordingly. Hard copies of the report will be delivered to the Commenting Authorities (North West Department of Economic Development, Environment, Conservation and Tourism; Mahikeng Local Municipality and Ngaka Modiri Molema District Municipality). A hard copy of the report will be available for review at the Mahikeng Library located at Robinson Street, Golf View, Mahikeng, 2745.

The report will also be made available via a dropbox link, Proof will be attached to the FBAR.

During this period, comments/ concerns are expected from organs of state, stakeholders and I&APs. All comments received during the DBAR review period will be adequately addressed and incorporated into the FBAR.

- **Focus Group Meeting**

A Focus Group Meeting (FGM) with the councillors and ward committee of the respective wards, as well as community forums will be scheduled to introduce the project and present the findings of the BAR. During this meeting, the councillors will advise whether a full public meeting will be required or not. Meeting Minutes will be included in the FBAR.

- **Public Meeting**

As per above, if required a public meeting, one will be scheduled where all I&AP's will be invited to attend. The findings of the Basic Assessment Report will be presented for discussion and all comments and concerns raised will be addressed and included as Meeting Minutes within the FBAR.

- **Submission of FBAR**

Following the DBAR review period, all issues raised by authorities and the public will be summarised and responded to and included in the Comments and Response Report which will be included in the

FBAR. The FBAR will be updated (where necessary), taking stakeholder input into account. The FBAR will then be submitted to DFFE for the 107-day decision-making period to issue an Environmental Authorisation.

- **Notifying I&APs of the Environmental Authorisation**

Once the Environmental Authorisation is received, I&APs will be notified of the outcome and granted a 20-day intent to appeal period.

## 5. DESCRIPTION OF THE AFFECTED ENVIRONMENT

The following chapter presents an overview of the biophysical and socio-economic environment in which the proposed project is located to:

- Understand the general sensitivity of and pressures on the affected environment;
- Inform the identification of potential issues and impacts associated with the proposed project; and
- Inform the identification of practical mitigation measures.

### 5.1 Screening Report

**Proposed Development Area Environmental Sensitivity:** Screening has been undertaken on the DFFE website to determine the sensitivities of the locations for both substation options. According to the Screening Report for Substation Options attached as **Appendix G2**, Specialist assessments identified

**Table 5: Environmental Sensitivities Identified**

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	
Defence Theme				X
Palaeontology Theme		X		
Plant Species Theme			X	
Terrestrial Biodiversity Theme	X			

**Specialist assessments identified:** Based on the selected classification shown in Table 4 and the environmental sensitivities of the proposed development footprint, the following specialist assessments have been identified for inclusion in the assessment report (see **Table 6**).

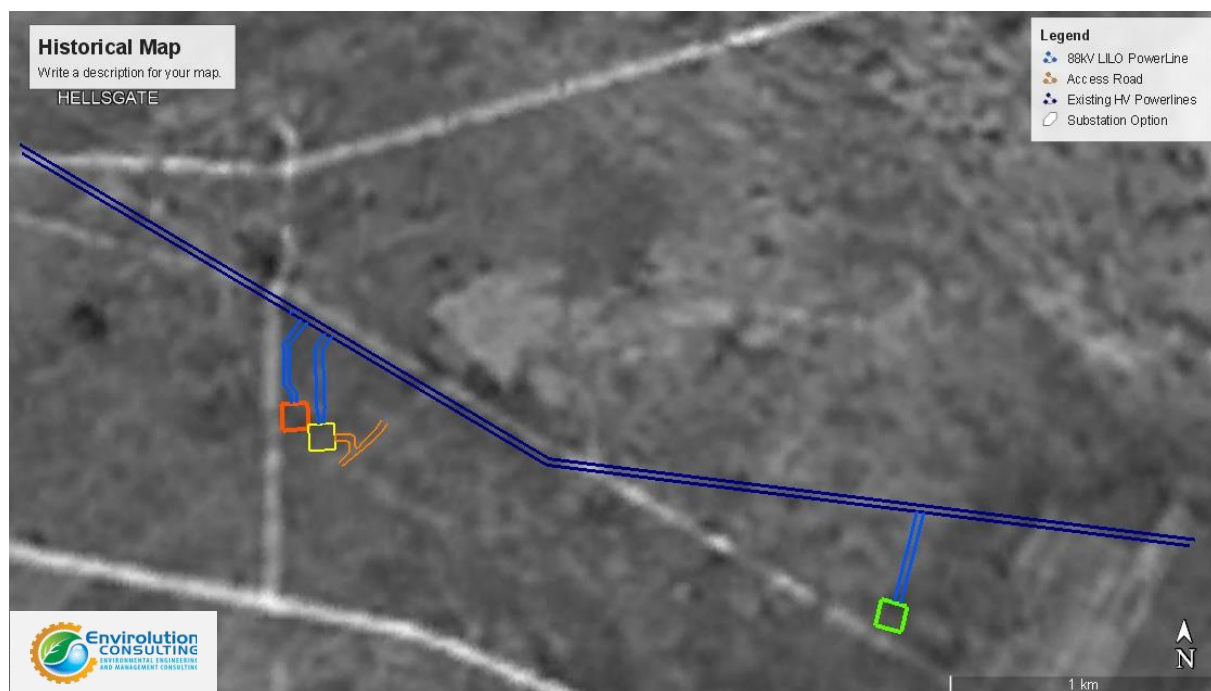
**Table 6: Specialist assessments identified by the screening tool**

No:	Theme	Has this been undertaken? Yes ✓ / No (X)
1	Agricultural Impact Assessment	X
2	Archaeological and Cultural Heritage Impact Assessment	✓
3	Palaeontology Impact Assessment	✓
4	Terrestrial Biodiversity Impact Assessment	✓

5	Aquatic Biodiversity Impact Assessment	✓
6	Geotechnical Assessment	X
7	Plant Species Assessment	✓
8	Animal Species Assessment	✓

#### Reasons for exclusion of the following identified specialist study:

- Agriculture:** Historically the area was used for agriculture although the two focus areas were left relatively unchanged from as early as 1958. The surrounding area has significantly changed and more recently the adjacent residential area has expanded. Option 1 and 3 are located within the area currently expanding while Option 2 remains directly north and adjacent to these developments. Based on the current expansion planned for the area it is likely that development will eventually encroach onto the area proposed as Option 1 & 3 while Option 2 is likely to remain clear for longer. Although a pan wetland is indicated within and north of Option 2, no significant wetness signatures can be seen in either historical or current aerial images (**Figures 8, and 9**).

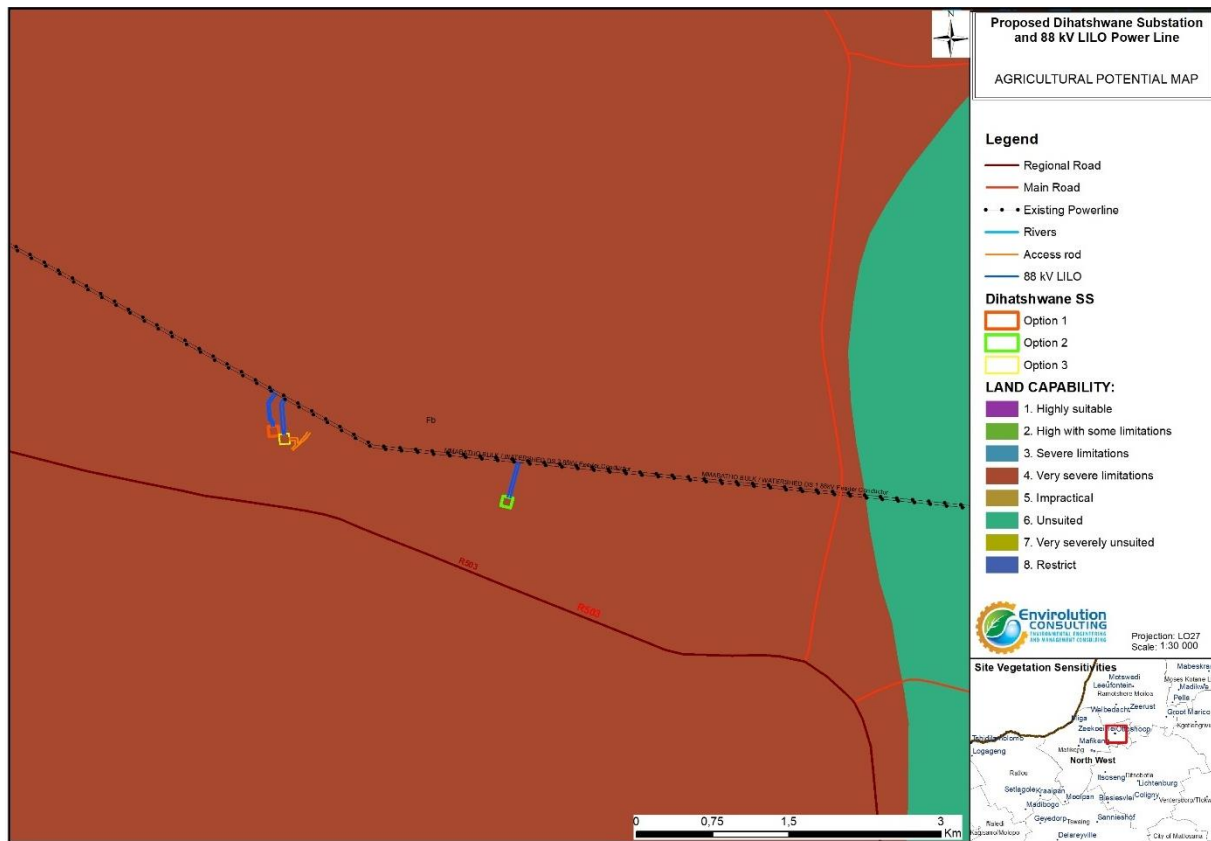


**Figure 8:** Historical image of 1958 indicating predominantly open areas with few impacts



**Figure 9:** Recent aerial imager of 2021 large increase in development near the proposed Substation Options

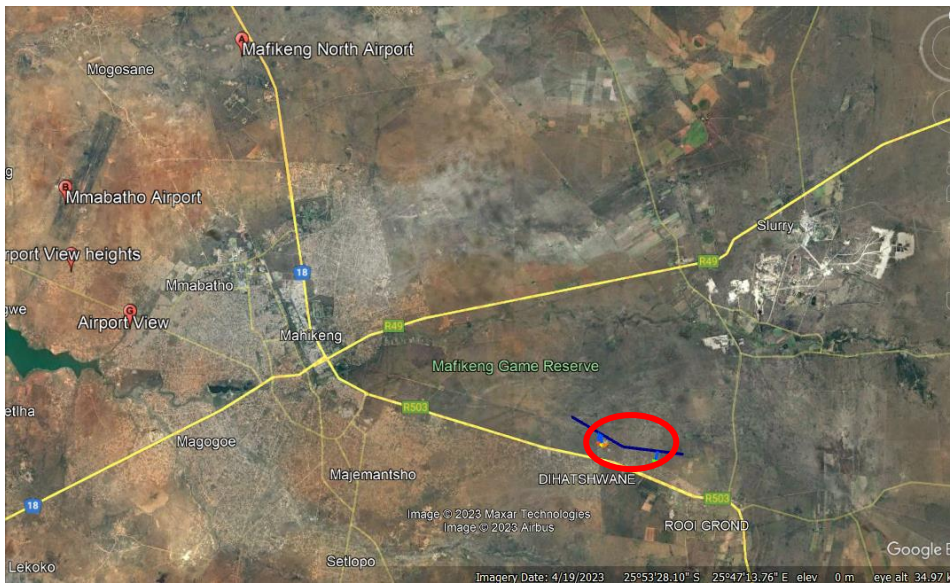
In terms of land capabilities, as depicted in **Figure 10**, has very severe limitation in terms of agricultural potential.



**Figure 10:** Land capabilities.



- **Geotechnical:** It is recommended that a detail geotechnical investigation be conducted along the substation site in order to verify the desk study findings and to provide site specific appropriate founding solutions.
- **Civil Aviation Assessment:** The nearest airport is approx. 20km west of the project in Mahikeng and 40km north of the Zeerust. The use of monopole structures also allows much more flexibility with respect to width of right-of-way and height requirements for structures. The 88kV incoming line will enter the proposed new substation at the approved safety height and these towers will exceed 15 metres in height.



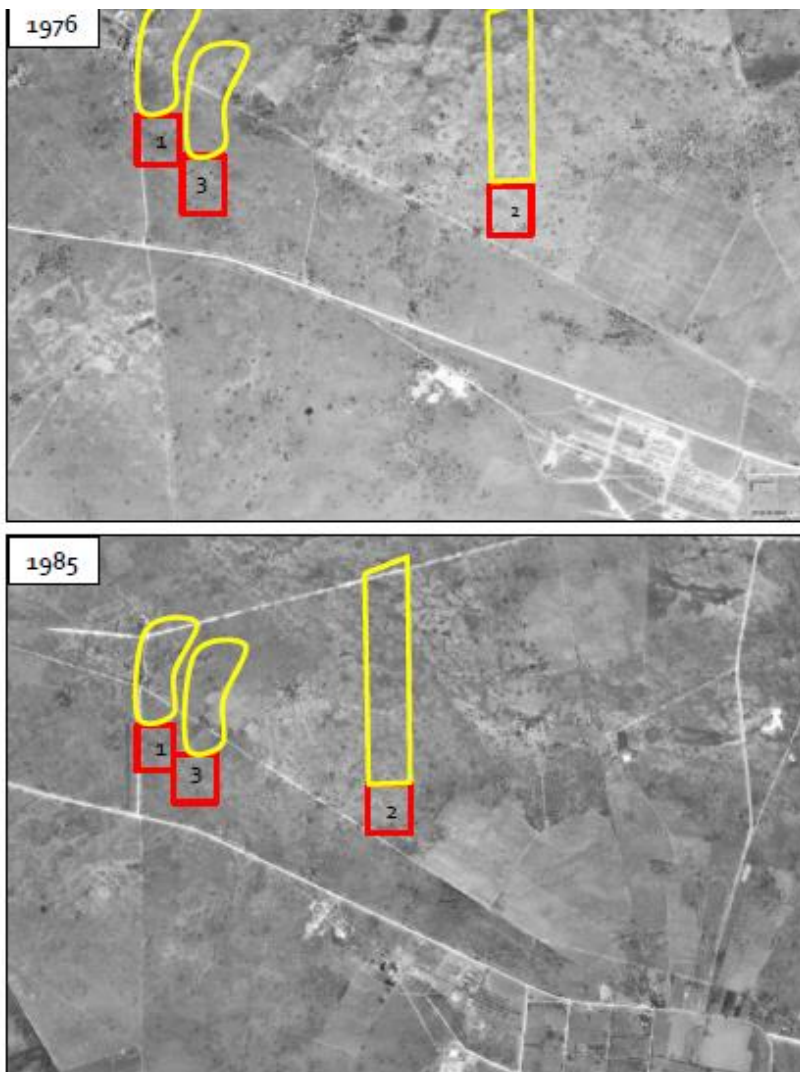
Nearby Airport near the Site (project area depicted in the red circle)

The section below discusses all specialist studies undertaken

## 5.2 Biophysical Characteristics of the Study Area and Surrounds

### 5.2.1 Land cover and land use

Historical aerial imagery indicates that neither of the sites were cultivated in the past (**Figure 11**). The sites and loop-in-loop-out powerline corridors seemed to remain largely unchanged and no vegetation clearing can be detected over available Google Earth satellite imagery.



**Figure 11:** Historical aerial imagery of the Alternative options for the substation (red) and powerline corridors (yellow) as estimated

By the year 2018, a water treatment facility was constructed to the west of Option 1, and to the north-west of Option 3. Residential can be seen to the east and south of Option 1 & 3. Residential areas are also present to the south and east of Option 2. At the time of the site visit, the land use on the Options were as follows:

#### Option 1 & 3:

- The site comprised natural vegetation.
- Trees are extensively harvested for firewood, particularly *Searsia lancea*.
- The land was grazed by goats and sheep.
- Soil disturbance was noted to the east of Option 1 and within the LILO corridor of Option 3,
- Heaped soil along a pipeline or cable were noted through the LILO corridors. This could also be berms.

#### Option 2:

- The site comprised degraded vegetation which was intensely grazed by cattle, goats, and sheep.

- Most large trees were harvested for firewood, leaving smaller dense stands of *Ozoroa paniculosa* and *Searsia ciliata*.
- A shallow drain or old road cuts through the northern portion of the site
- Due to the proximity of the residential area, a high degree of dumping and invasive weeds was recorded along the southern boundary of Option 2.

### 5.2.2 Topography

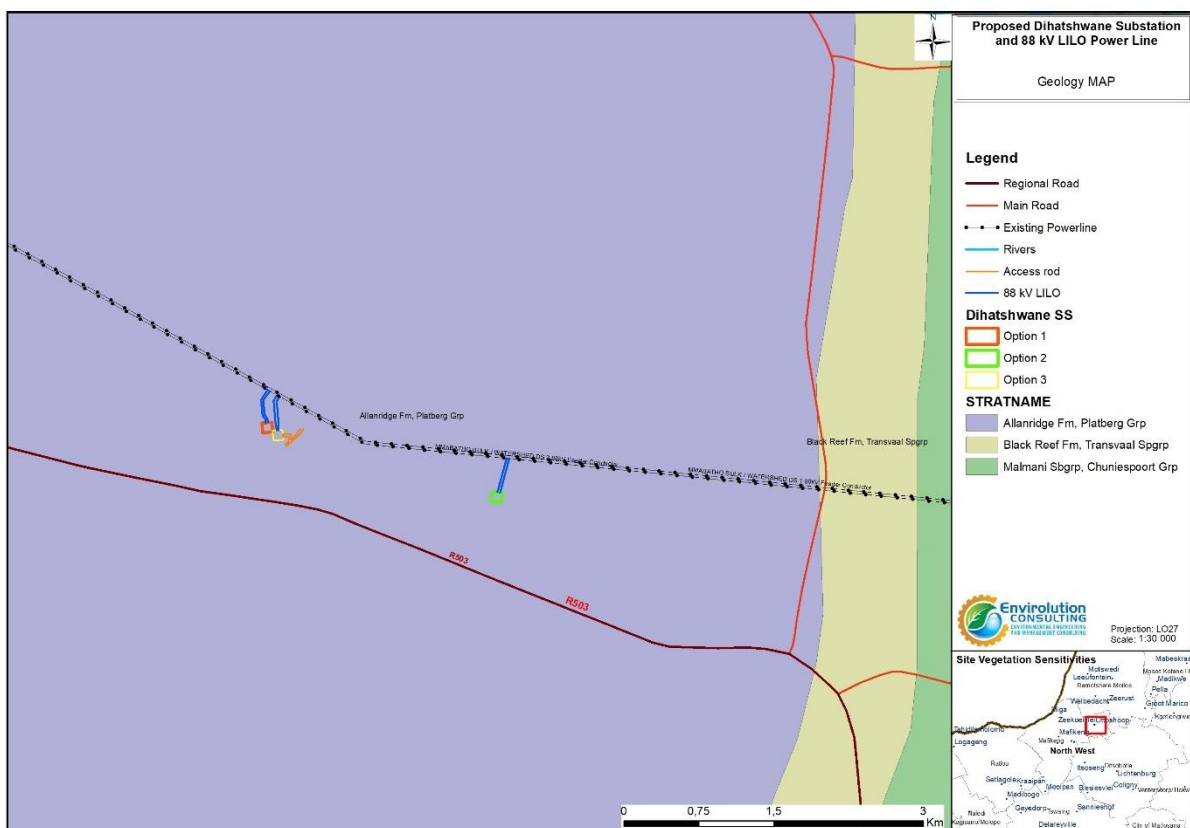
Plains or somewhat irregular undulating plains. Patches of dense Acacia Karoo bush in dry grassland describes the environment.

### 5.2.3 Climate

Warm-temperate, summer-rainfall region (October – April) with an average MAP of 533 mm. Hot summers with the frequent occurrence of frost during winters. Mean Annual Potential Evaporation of 2524 mm.

### 5.2.4 Geology

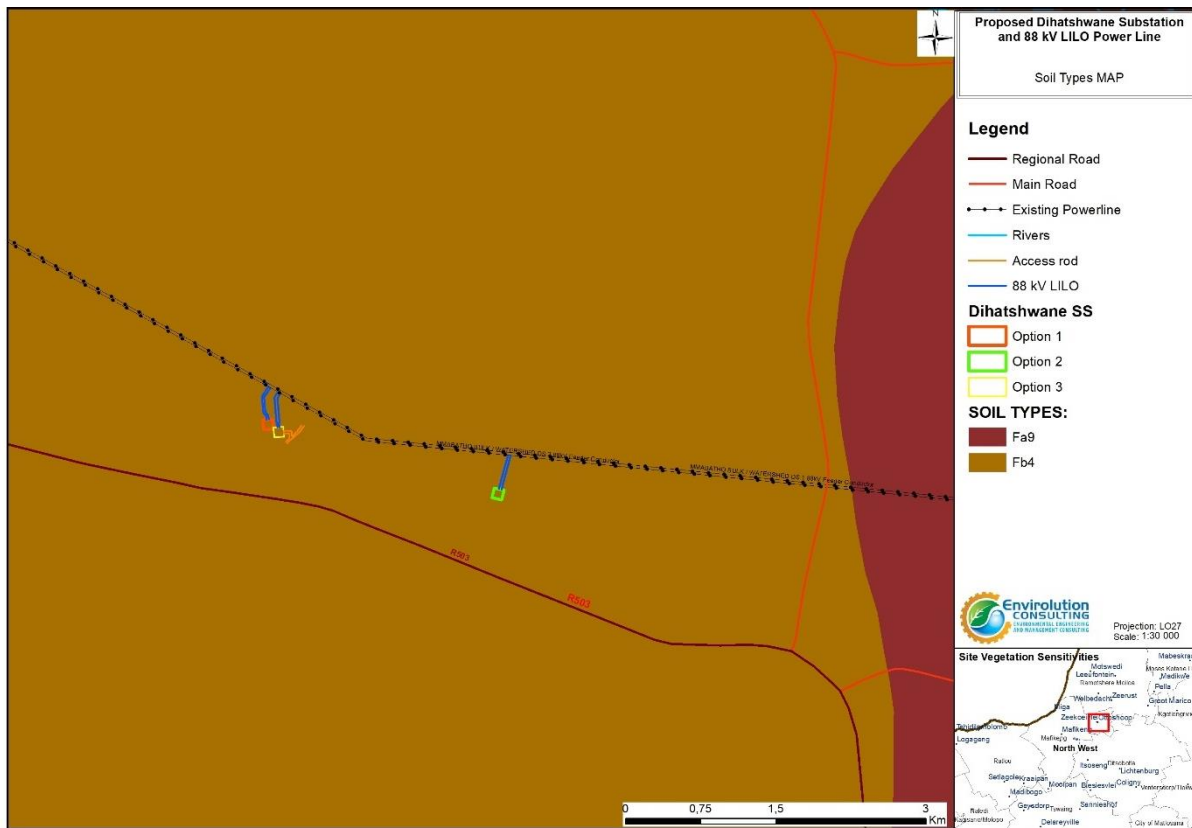
The project lies in the north western margin of Transvaal Basin that preserves the sediments of the Transvaal Supergroup. The underlying Ventersdorp Supergroup is represented by the uppermost stratum, the Allanridge Formation (**Figure 12**). Much of the area is unconformably overlain by the younger Tertiary sands and calcrete Shale, slate and quartzite of the Pretoria Group with interlaid diabase sills and Hekpoort lava supporting relatively shallow and rocky soils.



**Figure 12:** Geology Map

### 5.2.5 Soils

Both sites fall within the Fb soil group. The soils are shallow, with or without lime, and are of low agricultural potential. These soils have rock or weathered rock as underlying material (**Figure 13**).

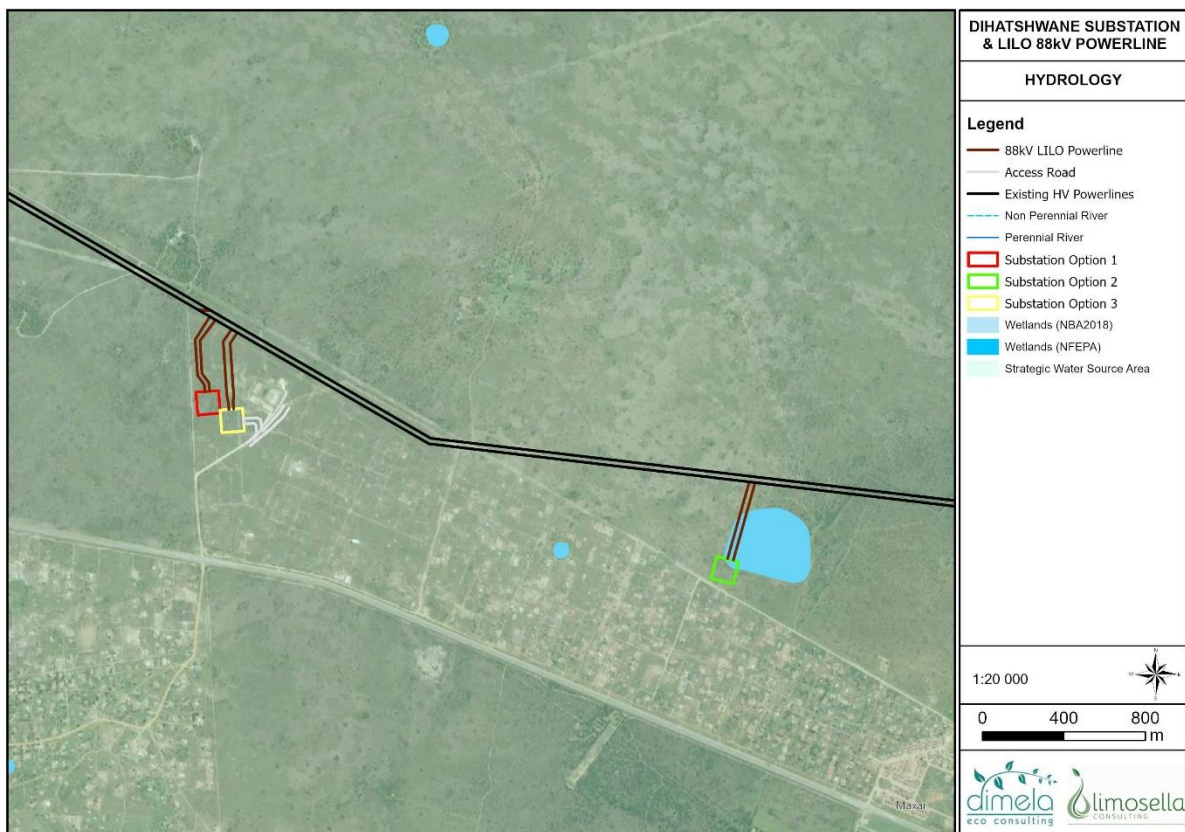


**Figure 13:** Soil Types Map

### 5.2.6 Hydrology

The site is situated in the Quaternary Catchments D41A within the fifth Water Management Area (WMA); Vaal Major WMA. In terms of important rivers in the near surroundings of the study sites, these include the Polfontein Spruit and Lothakane River which flows into the Molopo River West of the study sites. All the three study sites (Option 1; Option 2 and Option) are located within the Bo-Molopo Karst Belt Strategic Water Source Area. It covers an area of approximately 5268 km<sup>2</sup>, with a population of 327 125. This SWSA is considered important due to groundwater vulnerability focussing on contamination. The Bo-Molopo Karst Belt SWSA have >50% of its area rated as “high” vulnerability.

Reach 1055 (Molopo River) approximately 5km north of the site (PES=E) (EI=Moderate) (ES=Moderate). In terms of the Wetland Ecosystem Type, the sites fall within the Dry Highveld Grassland Group 5. A small portion of the site demarcated as Option 2 for the proposed Substation falls within a wetland, but it is not classified as a NFEPA wetland. 2 NFEPA wetlands can be seen approximately 1 km to the North of Option 2. The above is depicted in the Hydrology in **Figure 14**.



**Figure 14:** Hydrology Map

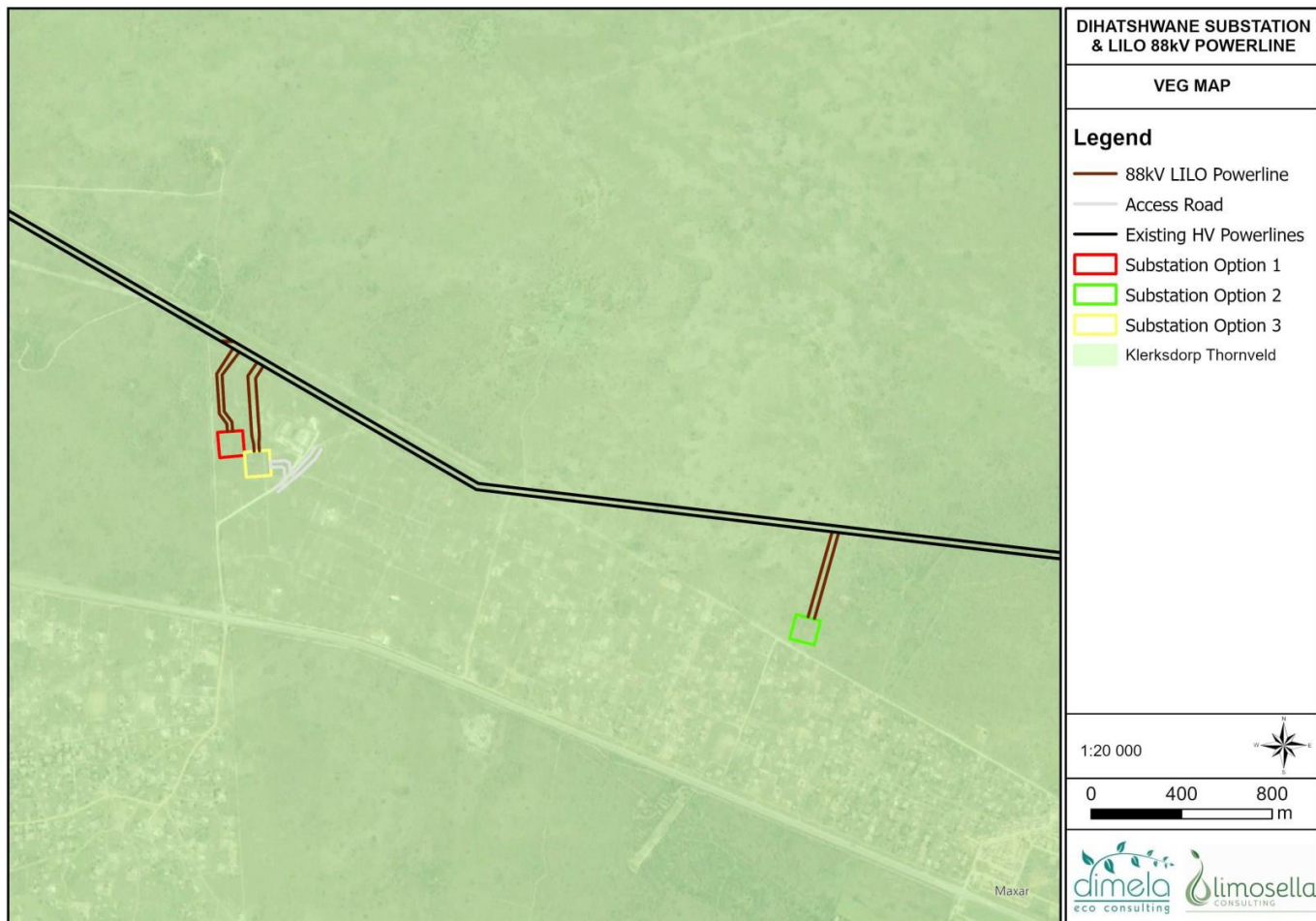
No watercourses were identified within 500m of either Option 1 or Option 2 and Option 3. However, the proposed Option 2 is located on dark clay soil that will retain water during high rainfall events and may resemble wetland areas during high rainfall seasons. This is especially true for small depressions within the area. Temporary wetland conditions may occur on these areas. No hydrophytic vegetation was recorded on the study areas. The area was dominated by woody terrestrial species. It should be noted that the site was very dry and grazed short and the vegetation cover may greatly differ during the rainy season. Further desktop methods including Wetland Probability (NBA, 2018) and slope (Google Earth, 2022) did not show any potential watercourses for both options. The slope was consulted to determine the presence of a historical depression pan wetland as indicated on the hydrology layers (that should be easily confirmed with slope). Both the North-South and the East-West slope indicates a relatively flat terrain without any major depression that could possibly be classified as a pan. Therefore, Option 1 and 3 are equally preferred Options where no wetlands or watercourses are certain to occur. Should Option 2 be chosen, it is advisable to conduct an additional wet season study to verify the presence or absence of hydrophytic vegetation and thus potential seasonal temporary wetland.

Refer to **Appendix E1** for the comprehensive Aquatic Biodiversity Assessment.

### 5.2.7 Vegetation

**Overview:** The study sites are situated within the Grassland Biome of South Africa and in specific within the Dry Highveld Grassland Bioregion (a bioregion is a vegetation organisation level between that of vegetation type and biome). The Dry Highveld Grassland Bioregion comprises several vegetation types. Both substation options fall within the Klerksdorp Thornveld. The vegetation is dominated by dry

grassland with open to dense *Vachellia karroo* (Sweet Thorn) woodland. This vegetation is considered *Vulnerable*. Only about 2.5% of the original extent of this vegetation is conserved in the nearby Mahikeng Game Reserve. Much of the vegetation has been transformed by cultivation and urban development. In addition, the vegetation has a high grazing potential and are often overgrazed which leads to the unnatural densification of *V. karroo* (Sweet Thorn). This is depicted in **Figure 15**.



**Figure 15:** Vegetation Map

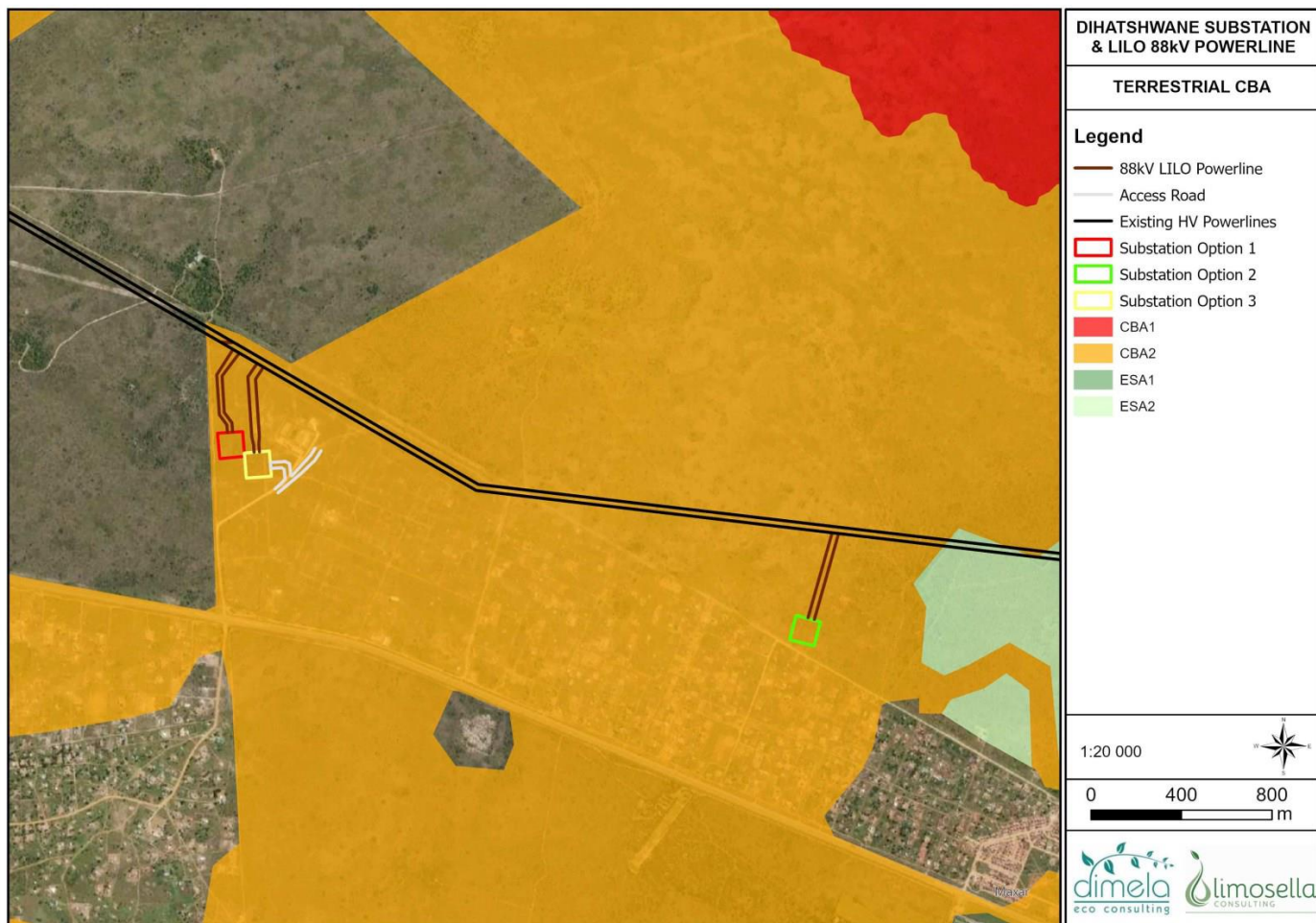
The vegetation at both Options comprised Klerksdorp Thornveld, however, the vegetation at Option 2 was in a degraded state due to heavy grazing, harvesting of firewood and dumping, while the powerline corridor of Option 3 included secondary and modified vegetation. As per the Site Ecological Importance (SEI) analysis, Option 2 scores a lower SEI due to its proximity to existing development and its degraded state. From a vegetation perspective, Option 2 is therefore the preferred site for the substation, although its associated LILO corridor is longer than that of Option 1 & 3. However, if the clay depression on Option 2 has wetland properties or for any other reason Option 2 is undevelopable, then this report does not object to the development on Option 3, provided that suitable mitigation measures are implemented. If mitigation measures are implemented throughout the project, the impact that the development will have in the long term is minimal.

The proposed substation will destroy 1ha of vegetation, while vegetation within the proposed LILO powerline corridors will be disturbed between 7 500 m<sup>2</sup> of vegetation, which could rehabilitate well over

time. The main impact is likely on ecological processes. Fire will be suppressed around the substation and powerlines, which could have an impact on the vegetation structure and composition, resulting in bush densification and a loss of species diversity.

### North West Biodiversity Conservation Assessment

All substation Options falls within a Critical Biodiversity Area 2 (CBA2) as depicted in **Figure 13**. CBA's are areas of the landscape that need to be maintained in a natural or near-natural state in order to ensure the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not maintained in a natural or near-natural state then biodiversity conservation targets cannot be met. Maintaining an area in a natural state can include a variety of biodiversity-compatible land uses and resource uses (North West DACE, 2009). A CBA 2 is assigned to areas where the remaining natural patches are larger than 5ha of provincially endangered and vulnerable ecosystems (vegetation types), i.e., the amount remaining intact of this vegetation type is less than 60%. Any further transformation of these vegetation types should be limited to existing transformed or heavily degraded areas.



**Figure 16:** CBA Map

**Protected areas:** The Mahikeng Game Reserve is situated directly west of Option 1, about 150m west of Option 3 and about 2.5km west of Option 2

**Listed- and Threatened ecosystems:** According to the 2011 Listed Ecosystems, the substation options do not fall within the historic extent of a listed ecosystem (National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (Government Gazette 34809, Government Notice 1002, and 9 December 2011). Although the National List of Threatened Terrestrial Ecosystems published in terms of the Biodiversity Act in 2011 remains in legal force, the data contained in the National Biodiversity Assessment (NBA) 2018 represents an update of the assessment of threat status for terrestrial ecosystems, but the National List of Threatened Terrestrial Ecosystems has not yet been revised.

According to the NBA, the site is situated within the Klerksdorp Thornveld, which is listed as Least Concern, albeit poorly protected (Skowno et al, 2019).

**Plant Species of Conservation Concern:** None of these species were recorded at the time of the site verification. However, one (1) geophyte which was historically classified as Declining was recorded just south of the Option 1 footprint, and west of Option 3. This species was nationally assessed and reclassified to Least Concern; however, the population numbers are still declining and therefore it is mentioned here and listed in Appendix C.

Due to the historical and ongoing impacts, none of the short-listed species are expected to be present on either of the Options, bar one Vulnerable species. This species may be present in the clay depression on Option 2 if it is confirmed to have wetland characteristics. This species was not recorded at the time of the field survey and a medium to low likelihood of presence can not be ruled. If wetland conditions are confirmed and the area will be impacted, then the area must be assessed for its presence once sufficient rain was experienced.

The Vulnerable *Searsia maricoana* was listed in the screening tool results and occurs more towards the Zeerust area. This species was not recorded on the site, however, the closely related *Searsia ciliata* occurred abundantly. Hahn (2013) considers *S. maricoana* insufficiently distinct from the widespread and common *S. ciliata* to warrant recognition as a separate taxon (Victor et al, 2017).

**Protected plants:** One species listed as a protected medicinal plant in the TOPS list could occur, namely *Harpagophytum procumbens* (devil's claw). This species could have been dormant at the time and was not recorded. No trade of this species is allowed without a permit.

**Provincially Protected Plants:** Several provincially protected plants are listed in the Transvaal Nature Conservation Ordinance Act No. 12 of 1983. These plants are not to be removed, damaged, or destroyed without permit authorisation from the North West Department: Economic Development, Environment, Conservation and Tourism (DEDECT). At the time of the field survey, one provincially protected succulent was observed just west of the LILO powerline corridor at Option 2. The succulent was in seed and was assumed to be *Orbea cf lutea*. This species can be relocated within permission of the local authority. This species may also be present at Option 1 & 3, but could have been obscured by taller grasses.

**Alien Invasive Plant Species:** The alien plant species identified on the study site are listed in Appendix E2. Note that according to the regulations, a person who has under his or her control a category 1b listed invasive species must immediately:

- (a) notify the competent authority in writing
- (b) take steps to manage the listed invasive species in compliance with
  - (i) section 75 of the Act;
  - (ii) the relevant invasive species management programme developed in terms of regulation 4; and
  - (iii) any directive issued in terms of section 73(3) of the Act.



**Table 7** list the invasive species encountered. The infestation was low, with the highest number of invasive species recorded at Option2 alongside the road dividing the site from the community.

**Table 7:** Category 1b invasive plant species recorded at the time of the site verification.

Species	Common name	Locality
<i>Argemone ochroleuca</i>	Mexican Poppy (White)	Option 2 and northeast of Option 1
<i>Datura ferox</i>	Large Thorn Apple	Option 2, southern boundary
<i>Flaveria bidentis</i>	Smeltersbush	Option 2, southern boundary
<i>Opuntia ficus-indica</i>	Sweet Prickly Pear	Sporadic occurrence on both sites

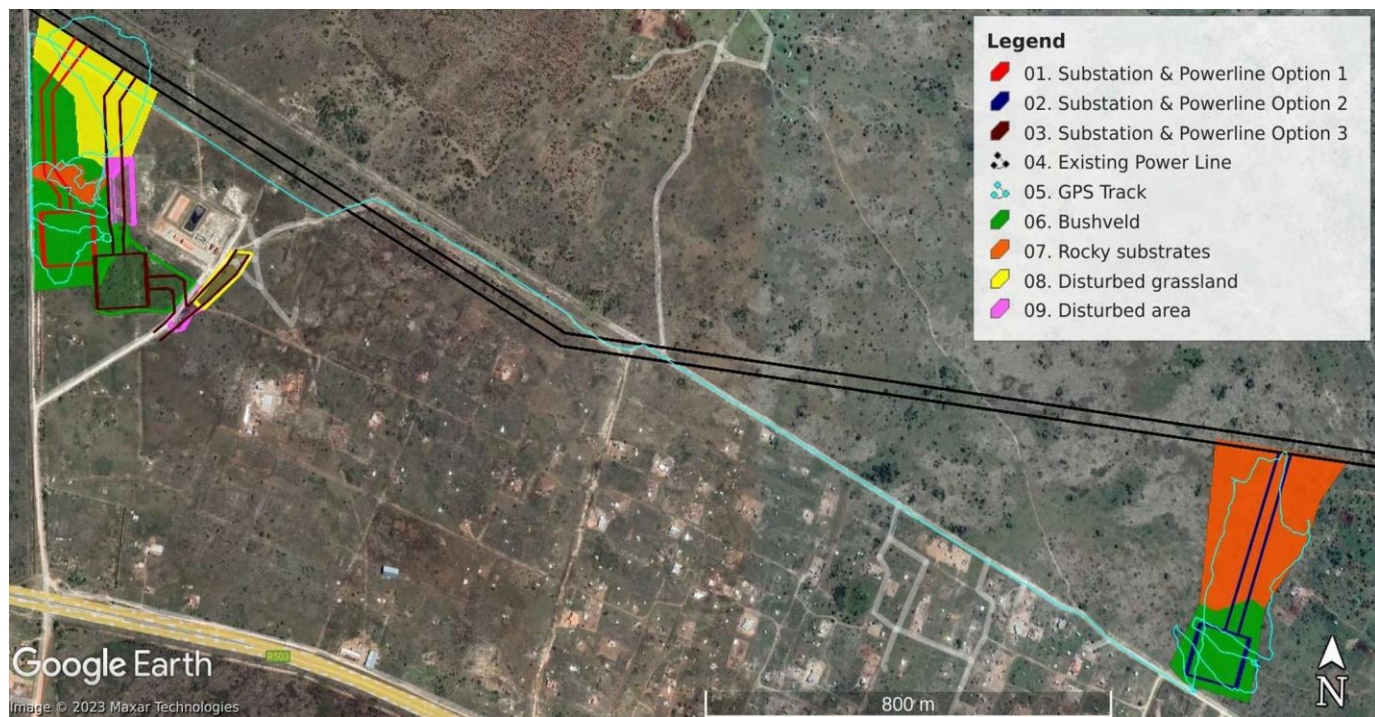
### 5.2.8 Fauna

The site is dominated by open bushveld with low scrubs and trees. Areas of open grassland were noted at Option 1 and 3 which appear to indicate some historical activity in the area (evidenced by berms across site). Patches of rocky habitats were noted along the existing powerline servitude, dominating at Option 2, limited to flat areas of exposed rock or small boulder strewn areas with gravel substrate. Areas around Option 2 indicated greener patches that may be attributed to onsite wetlands, but no open water or moist habitats were noted. Dried muddy areas were scattered around Option 1 (**Figure 17**).

No burrows were noted on site, only feeding digs were observed and soil mounds suspected to belong to Mole-rats (*Cryptomys pretoriae* suspected based on known distribution). Termite mounds / anthills were also scarce on site (only two potential active mounds were noted). The anthropogenic activity near and around site (pedestrians, herders with stock animals and informal settlers) and the possible activity of domestic animals (feral cats), means that many animals could be hunted or chased off site.

The altitude on site varies between 1368-1388mamsl (may exclude slight local variations) and the area could be considered as gently sloping to flat. Species preferring altitudes outside this range are not considered to occur on site.

Refer to **Appendix E3** for the comprehensive Fauna Assessment.

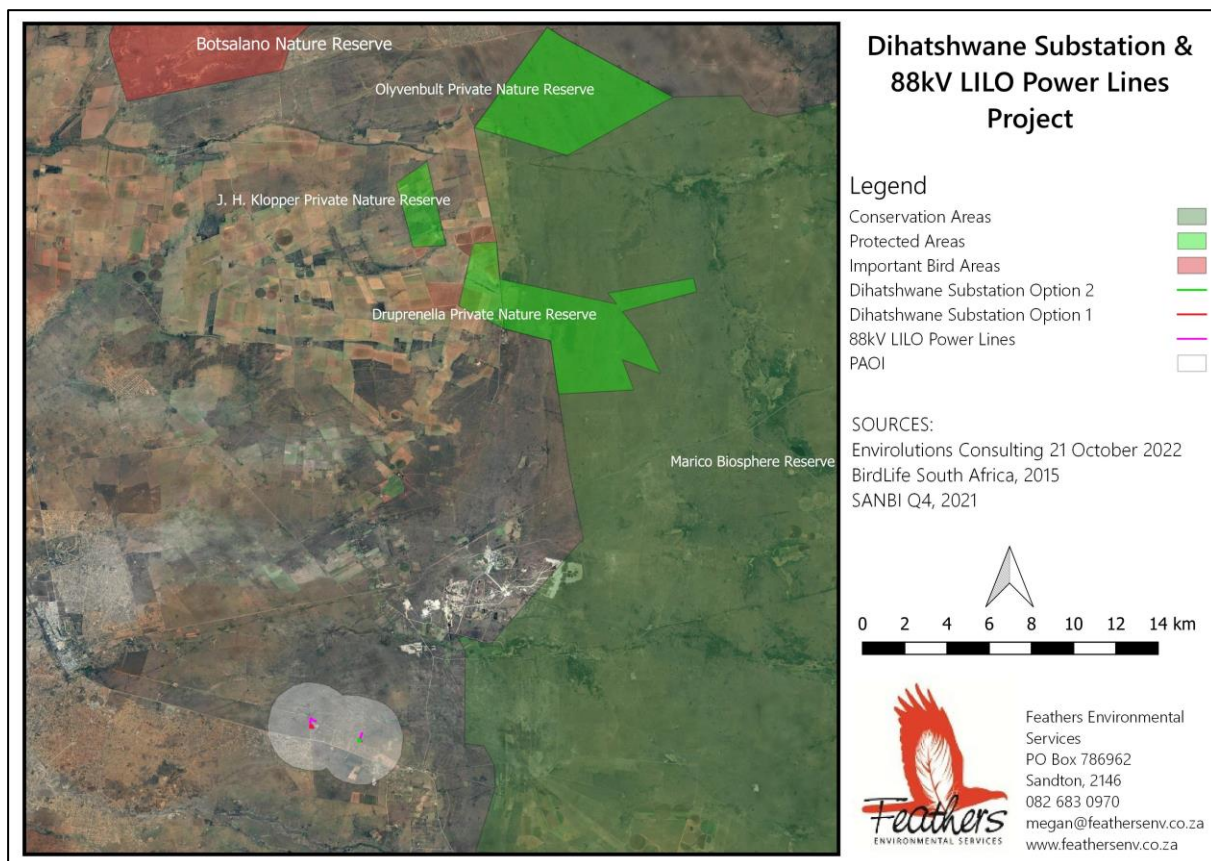


**Figure 17:** Habitat units

### 5.2.9 Avifauna

#### Important Bird Areas

The Botsalano Nature Reserve is one of very few reserves in South Africa that holds the western population of the regionally threatened Short-clawed Lark *Certhilauda chuana* and in which the globally threatened Melodious Lark *Mirafra cheniana* can be found. Despite the proximity (in bird terms, particularly for far-ranging species) of the Botsalano Nature Reserve IBA to the PAOI and the reported occurrence of the aforementioned species within the broader PAOI, the construction of the proposed Dihatshwane Substation and 88kV LILO power line alignments will not displace the species this IBA supports. The Marico Biosphere Reserve occurs within 20km of the PAOI and an additional five protected areas are located within a 50km radius of the PAOI (**Figure 18**). These areas are protected by law and managed for biodiversity conservation, providing much needed habitat that can potentially support a diversity and abundance of avifaunal species. Similar to IBAs these areas may provide an indication of the avifaunal species that are likely to occur in similar habitats found within the PAOI. It is unlikely that the disturbance associated with the construction of the Dihatshwane Substation and 88kV LILO power lines will have a significant negative impact on the surrounding protected areas and the species they support. The collision and electrocution impacts are likely to affect those far-ranging species if not mitigated appropriately.



**Figure 18:** Protected Areas and Important Bird Areas.

#### South African Bird Atlas Project 2 Data

A total of 214 bird species have been recorded within the Dihatshwane Substation and 88kV LILO power lines PAOI pentads during the South African Bird Atlas Project 2 (SABAP2) atlassing period to date. The presence of these species in the broader area provides an indication of the diversity of species that could potentially occur at the substation locations or along the proposed LILO route alignments. Of the 214 species, six are regional Species of Conservation Concern (SCC). Relevant to this development, 40 species are classified as power line sensitive species. Of the power line sensitive species, eight are likely to occur regularly at the substation locations and along the proposed 88kV LILO power line alignments, 14 are largely comprised of raptors and large terrestrial species that may traverse across the PAOI and the remaining 18 are likely to occur sporadically. It is important to note that the SCC have been recorded in very low numbers with between one and ten individual birds of each species being recorded over the fourteen-year survey period. This is an accurate reflection of the diversity and abundance of SCC that are likely to be found within the area surrounding the proposed Dihatshwane Substation and 88kV LILO power lines given the habitat present and the existing disturbance in the PAOI. No SCC was observed during the field survey.

A single spring survey was conducted on 23 September 2022, with a focused effort on the areas within the proposed substation locations and through which the LILO power line alignments traverse. The site visit produced a combined list of 29 species. The majority of observations were of passerine species that are common to this area. Each of these species has the potential to be displaced by the construction of proposed Dihatshwane Substation and 88kV LILO power lines as a result of habitat transformation and/or disturbance. However, these species have persisted despite existing disturbance (i.e. pastoral, agricultural and residential activity) within the PAOI. This resilience, coupled with the fact that more

suitable habitat is available within the broader area, means that the displacement impact will not be of regional or national significance. The proximity of the Mahikeng Game Reserve in relation to Substation Option 1 may pose a disturbance risk to the powerline sensitive species residing and potentially breeding within the reserve. The disturbance impact associated with construction activities on the boundary of this property is likely to be more significant albeit temporary.

#### Avifaunal Habitats

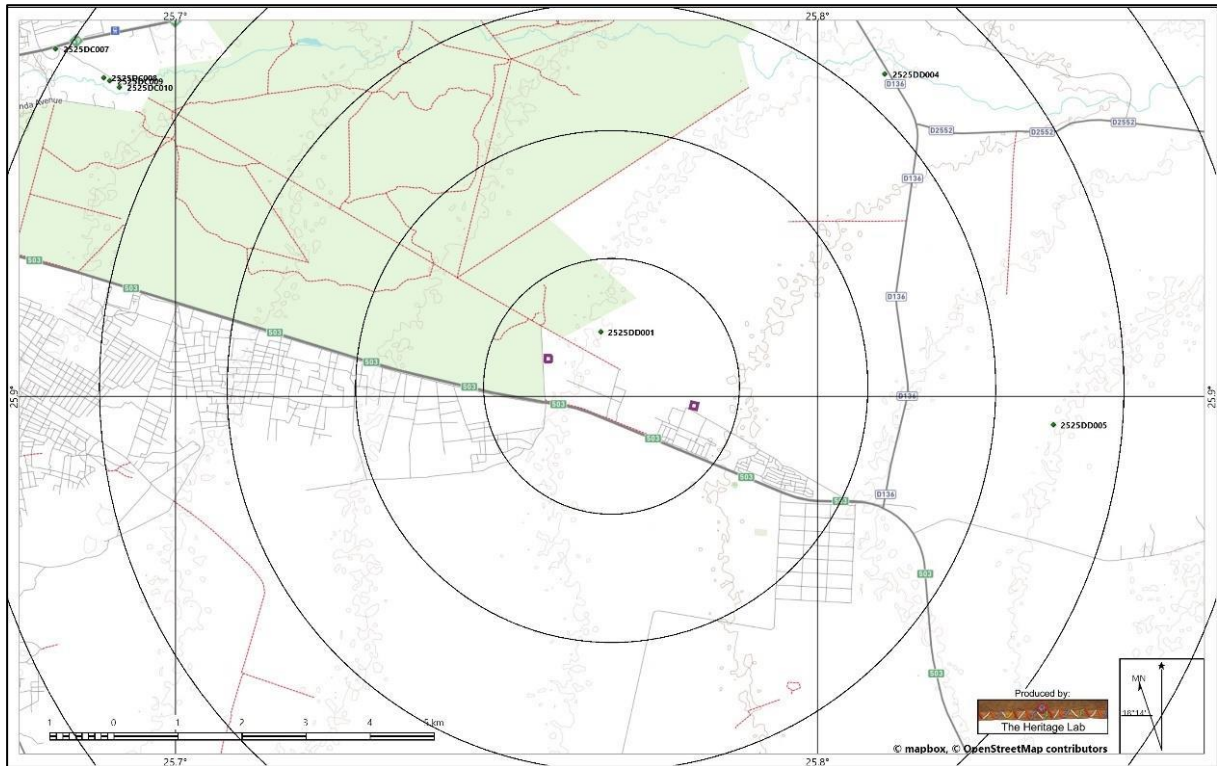
The Dihatshwane Substation and 88kV LILLO power line alignments are located within a single primary vegetation division namely the Grassland Biome, specifically Klerksdorp Thornveld. Grasslands represent a significant foraging area for many bird species. Specifically, open grassland in the broader area could attract the following power line sensitive species Amur Falcon, Greater Kestrel, Lesser Kestrel, Lanner Falcon, Northern Black Korhaan, Pale Chanting Goshawk, Secretarybird and Western Cattle Egret. The grassland patches are also a favourite foraging area for game birds such as francolins, sandgrouse and Helmeted Guineafowl *Numida meleagris*. This in turn attracts large raptors, because of both the presence and accessibility of prey.

It is likely that most of the species mentioned in the preceding paragraph still occur in the PAOI from time to time, especially in areas where the vegetation is still intact. The nature of the vegetation within the development footprint is poor, with evidence of significant overgrazing and pedestrian traffic.

### **5.3 Human Environment**

#### **5.3.1 Heritage Features**

As per the HIA, the cultural landscape qualities of the larger region essentially consist of two components. The first is a rural area in which the human occupation is made up of a very limited pre-colonial element (Stone Age and Iron Age). The second component is an urban landscape dating to the colonial period. During the survey no sites, features or objects of cultural significance were identified. This is depicted in **Figure 19**.

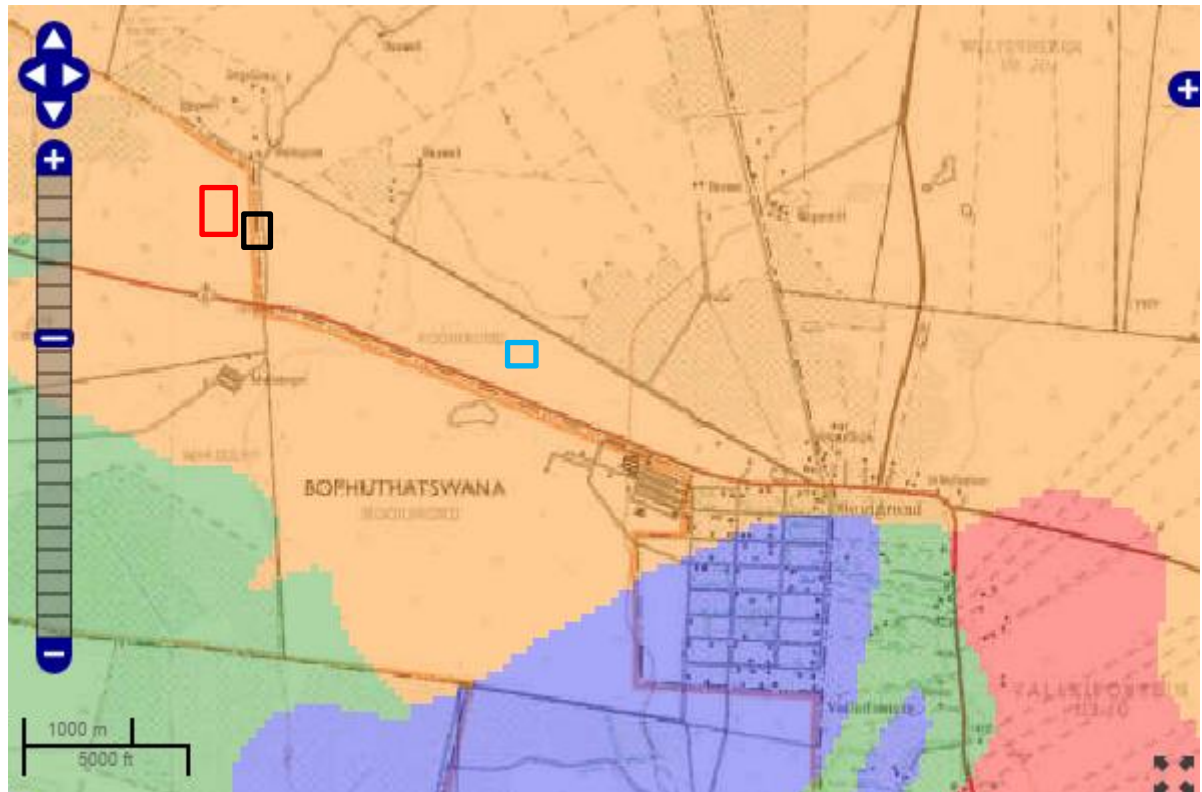


**Figure 19:** Location of known heritage sites and features in relation to the project area

**(NB: Circles spaced at a distance of 1km: heritage sites = coded green dots)**

From a heritage point of view, it is recommended that the proposed development be allowed to continue on acceptance of the mitigation measures presented above and the conditions proposed below:

- Should archaeological sites or graves be exposed during further construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in the report.
- The Palaeontological Sensitivity Map (SAHRIS) (**Figure 20**) indicate that the project area has a high sensitivity of fossil remains to be found and therefore a desktop palaeontological assessment is required. Based on that, a field assessment is likely.



**Figure 20:** SAHRIS Palaeosensitivity map for the site for the proposed Dihatshwane Substation  
(Red outline (Alt 1), turquoise outline (Alt 2) and black outline (Alt 3))

All the Substation Options lie on the Tertiary-Quaternary Calcrete that might have trapped fossils although none has been reported from this area. Nonetheless, a Fossil Chance Find Protocol should be added to the generic EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or drilling for foundations have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised.

Refer to **Appendix E5** and **E6** for the comprehensive Heritage Impact Assessment and Palaeontology Impact Assessment respectively.

### 5.3.2 Socio-Economic Features

The Ngaka Modiri Molema District Municipality is one of the districts within the North West Province within 28 206.08km<sup>2</sup>. The proposed development is to occur in Mahikeng Local Municipality.

- **Demographics:** The majority of the province's residents are Tswana people who speak Tswana, as in neighbouring Botswana. Smaller groups include Afrikaans, Sotho, and Xhosa speaking people. English is spoken primarily as a second language. Most of the population belong to Christian denominations.

According to the 2007 community survey 90.8% of the province's population was Black (mostly Tswana-speaking), 7.2% as White (mostly Afrikaans speaking), 1.6% as Coloured and 0.4% as Asian. The 2007 community survey showed the province had a population of just over 3 million. The province's white population is very unevenly distributed. In the southern and eastern

municipalities, the white percentage in double figures such as the Tlokwe and Matlosana where the white percentages were 27% and 12% respectively.

The province has the lowest number of people aged 35 years and older (5.9%) who have received higher education. Since 1994 the number of people receiving higher education has increased. After the disbanding of the bantustans, many people migrated to the economic centres of Cape Town and Gauteng.

- **Economic Profile:** The mainstay of the economy of North West Province is mining, which generates more than half of the province's gross domestic product and provides jobs for a quarter of its workforce. The chief minerals are gold, mined at Orkney and Klerksdorp; uranium, mined at Klerksdorp; platinum, mined at Rustenburg and Brits; and diamonds, mined at Lichtenburg, Christiana, and Bloemhof. About 85% of all money-making activities take place between Klerksdorp and Potchefstroom. The economic heart of the province is Klerksdorp. The northern and western parts of the province have many sheep farms and cattle and game ranches. The eastern and southern parts are crop-growing regions that produce maize (corn), sunflowers, tobacco, cotton, and citrus fruits. The entertainment and casino complex at Sun City and Lost City also contributes to the provincial economy.
- **Education:** The province had two universities: the University of North West, which was formerly called the University of Bophuthatswana (founded in 1979), in Mmabatho; and Potchefstroom University for Christian Higher Education (founded in 1869; became a constituent college of the University of South Africa in 1921 and an independent university in 1951). These two universities have now merged and the new institution is called North-West University. As part of the Department of Education's proposed plans for higher education, the existing four higher learning institutions will be merged to form two. During 2003, as part of the Year of Further Education and Training project, three mega institutions, Taletso, ORBIT and Vuselela, were established to provide technical and vocational training to the youth. These institutions have been incorporated into many of the former education and technical colleges and manpower centres.

## 6. IDENTIFICATION OF ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS

### 6.1 Vegetation

#### 6.1.1 Results of the Vegetation Assessment

The site survey found that both sites comprised Klerksdorp Thornveld, which was not historically cultivated or cleared. However, the powerline corridor of Option 3 included significant soils disturbances as well as secondary vegetation. Also, Option 2 is situated directly north of a residential area and has been severely impacted on by grazing, dumping and the harvesting of firewood. The species diversity on Option 1, 3 and Option 2 was comparable, however, trees such as *Searsia lancea* (karee) and *Vachellia karoo* (sweet thorn) were harvested from Option 2, and grasses grazed short. This likely shifted the grass dominance and led to an increase in the smaller trees such as *Searsia ciliata* and *Ozoroa paniculosa*. Based on the above, the vegetation was broadly grouped and discussed as follows:

1. Klerksdorp Thornveld (Option 1 & 3)
2. Degraded Klerksdorp Thornveld (Option 2)
3. Secondary and modified vegetation (Option 3)

The vegetation is discussed below and geographically represented in **Figure 21**.

#### **Klerksdorp Thornveld (Option 1 & 3)**

The vegetation on Option 1 can be described as wooded grassland vegetation with a distinct tree layer but not to the extent that the tree cover comprises more than 35% of the wooded plant canopy. Hence, a well-developed grass and herbaceous layer were also noted, characteristic of the Klerksdorp Thornveld. The soil layer varied from deeper sand with exposed dolomite to shallow soils of a pebbly nature.

The tree layer was dominated by *Searsia lancea* (karee) and *Vachellia karoo* (sweet thorn). The tall shrub *Ehretia rigida* (puzzle bush) was common, as well as patches of the small trees *Searsia ciliata* and *Vachellia hebeclada* subsp. *hebeclada* (candle thorn). The grass layer was still dry, however grasses that were dominant were identified as *Heteropogon contortus* (spear grass), *Cymbopogon pospischilii* (narrow-leafed turpentine grass) and *Eragrostis* species. Dominant herbaceous species included the shrub *Lippea scaberrima*, the succulent *Bulbine narcissifolia*, the suffretex *Elephantorrhiza elephantina* and small forbs *Dicoma macrocephala*, *Hermannia depressa*, and *Aptosimum lineare* (carpet flower). The small geophyte *Albcaea setosa* was common and the larger geophyte, *Boophone distichia* (poison bulb) was recorded to the south of Option 1 and along the northern extent of the LILO. The parasitic *Visvum combreticola* (mitsletoe) grew in numerous *Vachellia* trees. At the time of the assessment 13 tree species, 22 herbaceous species and 9 grass species were observed. It must be noted that the species diversity is likely higher, although this can only be confirmed after sufficient summer rainfall.

#### **Degraded Klerksdorp Thornveld (Option 2)**

The vegetation at Option 2 was heavily grazed and large trees were removed for firewood. The grazing and removal of trees led to a shift in species dominance within the Klerksdorp Thornveld. Grasses were grazed short and not readily identifiable. However, it is assumed that the palatable grasses have declined giving rise to an increase in Increaser II and III grasses (grass species that increase in overgrazed veld that include pioneer and sub-climax species). The dominant *Searsia lancea* and *Vachellia karoo* tree species that should typically be present (as observed at Option 1),



were harvested for firewood, giving rise to a dominance of the trees *Euclea undulata* (common guarri), *Ozoroa paniculosa* (resin tree), *Searsia ciliata* and the encroacher *Tarchonanthus camphoratus* (camphor tree). Also, several saplings of the pioneer tree *Gymnosporia buxifolia* (common spike thorn) were recorded. This tree tends to act as a pioneer in disturbed and degraded bushveld. The tree *Searsia lancea* remained along the northern extent of the powerline corridor.

The grass layer included species such as *Aristida congesta*, *Eragrosis superba*, and *Cymbopogon pospischilii*. The forb diversity included an abundance of the succulent *Bulbine narcissifolia* and *Moraea pallida* (geeltulp) (both species proliferate under heavy grazing). Other plants indicative of disturbances includes *Sesamum triphyllum* (wild Sesame) and *Geigeria burkei* (vermeerbos). The soils become rockier in the north of the powerline LILO corridor, and two succulents were recorded: *Euphorbia* cf *davyi* and *Orbea* cf *lutea*. At the time of the assessment 11 tree species, 24 herbaceous species and 8 grass species were observed.

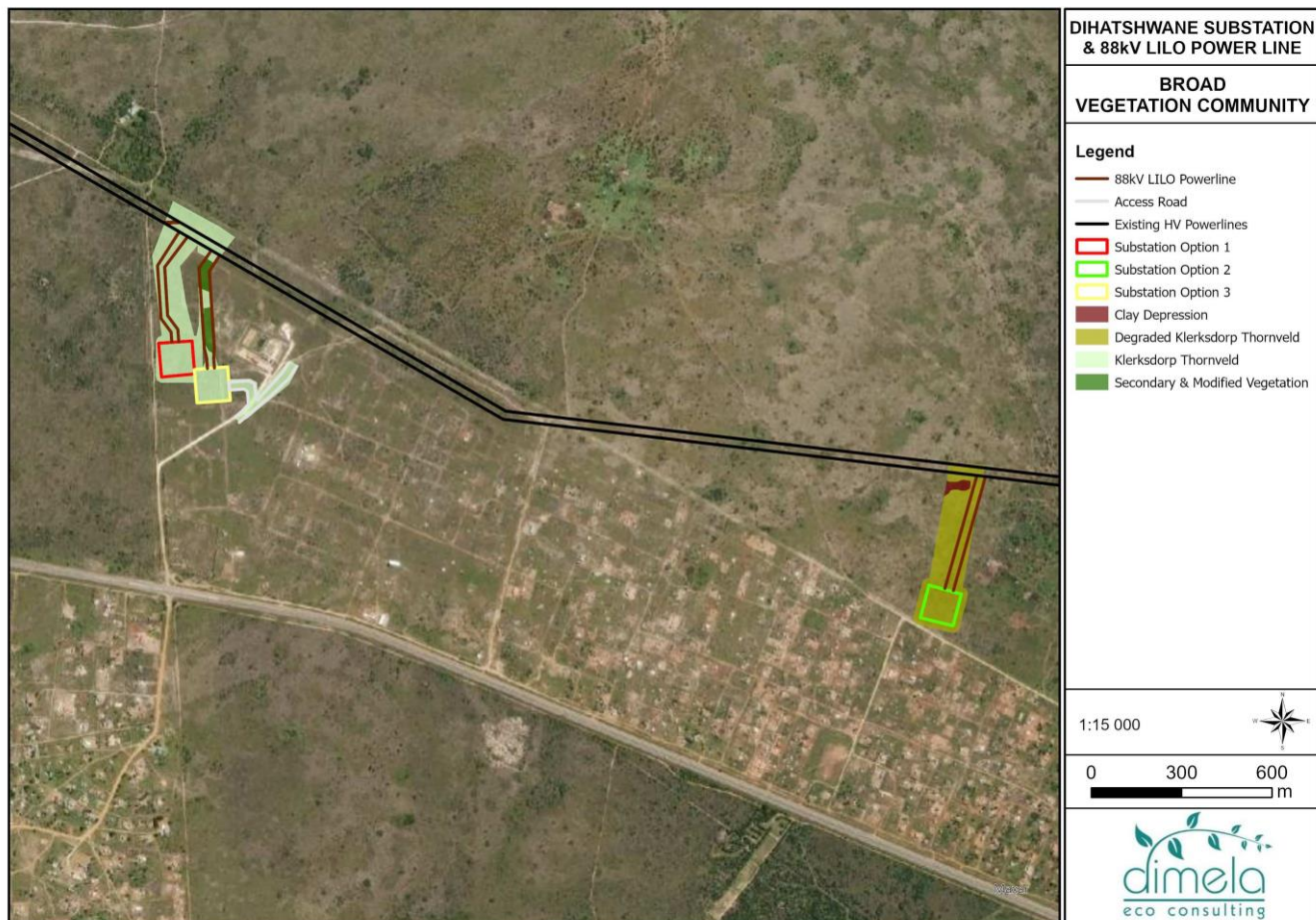
A clay depression was noted through the powerline LILO corridor, north of Option 2 (Figure 20). No wetland plant species were recorded here, and it is assumed that the area might drain slower during rainy events. The small tree *Searsia ciliata* formed dominant patches in this depression. The only species that might prefer moist soils growing here at the time of the field survey, was *Bekheya onopordifolia* var *onopordifolia*.

### Secondary and modified vegetation

Historical disturbances, associated with the construction of the water facility impacted on the vegetation within the LILO corridor of Option 3. Open pits were still noticed, colonised mainly by pioneer grass species such as *Eragrostis lehmaniana*, *Cynodon dactylon*, and *Aristida congesta*. Secondary vegetation in the northern extent of the powerline corridor included trees such as *Vachellia karoo*, *Tarchonanthus camphoratus*, and *Searsia ciliata*. The forb layer included *Gazania krebsiana*, *Helichrysum argyrospaeum* and *Felicia muricata*.

Although option 3 was not directly assessed, a transect for Option 1 did traverse a portion of Option 3 and its powerline corridor. However, a full species list was not noted during the assessment. It is highly unlikely that plant species of conservation concern are present in this vegetation group.

Refer to **Appendix E2** for the comprehensive Vegetation Assessment.



**Figure 21:** Vegetation groups on the Substation Options

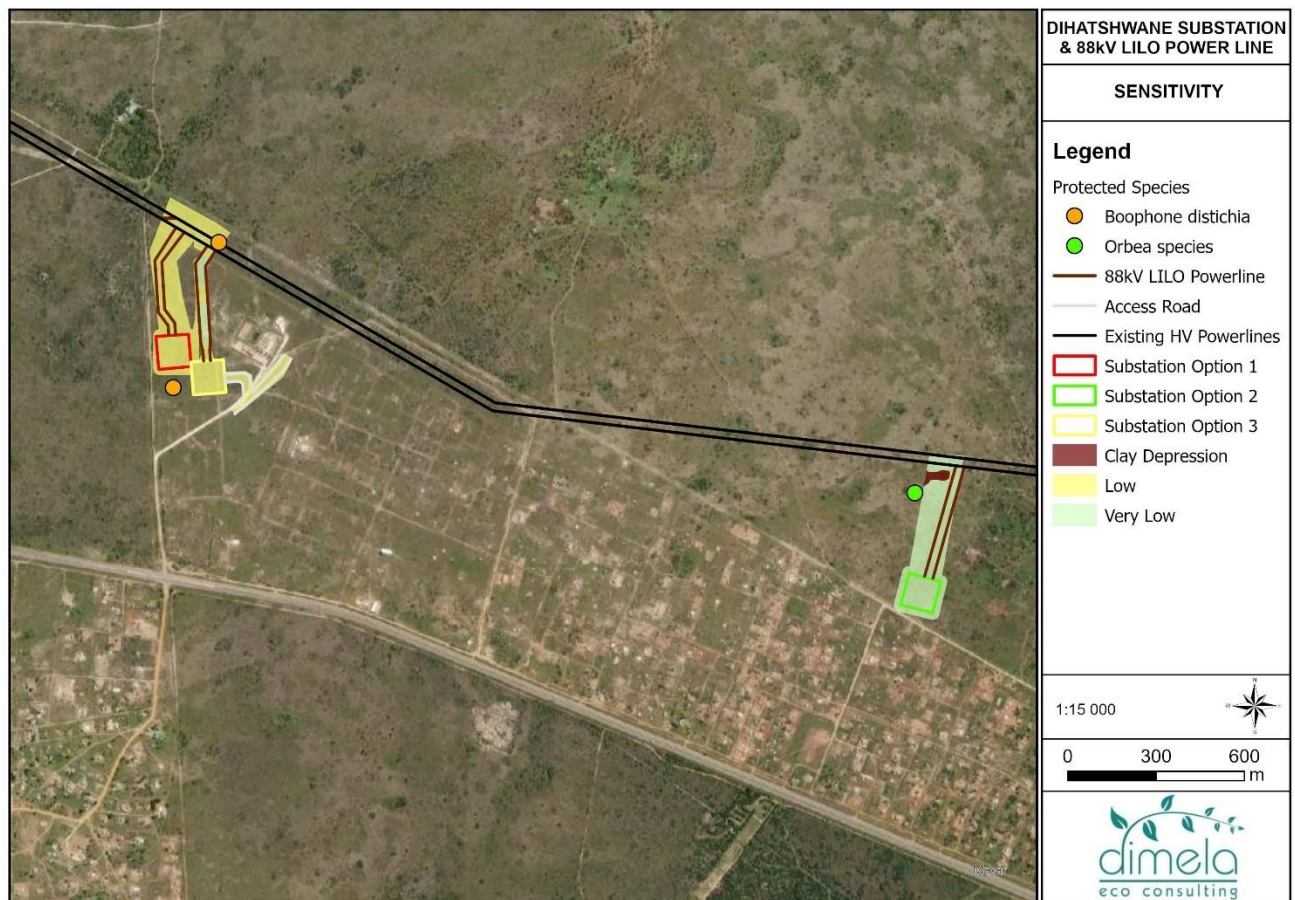
### 6.1.2 Vegetation Sensitivity:

**Critical Biodiversity Area:** Neither of the proposed Options and LILO powerline corridors are within a listed ecosystem, however, all three sites and LILO powerline corridors fall within a Critical Biodiversity Area. This indicates that the area is likely to support good condition, natural vegetation, and plant species of conservation concern. However, the proposed development footprint is small in comparison to the larger CBA2 and situated alongside existing residential and transformed areas, concentrating the developments. Development of the substation will destroy 1ha of a CBA2, while the LILO powerline corridors will impact on a maximum of about 1ha (Option 2) has the longest corridor). Vegetation within the LILO corridor could re-establish if mitigation measures are implemented and therefore the proposed development is not considered to have a significant impact on the CBA in future.

**Plant species of conservation concern:** No plant species of conservation concern were recorded at either of the proposed development sites. One (1) Vulnerable species may be present in the clay depression within the LILO powerline corridor of Option 2 and if this area is to be impacted on, the area must be assessed for its presence once sufficient rain was experienced. A geophyte, historically listed as Declining (reclassified to Least Concern, however the numbers are still Declining) were recorded close to Option 1 & 3.

**State of vegetation:** The vegetation at Option 1 was in a natural state, while the vegetation within the powerline of Option 3 included secondary and modified vegetation. Also, vegetation at Option 2 was highly degraded due to heavy grazing, harvesting of firewood and dumping. As per the Site Ecological Importance (SEI) analysis, Option 2 is the preferred site for the substation due to its proximity to existing development and its degraded state. However, if the clay depression on Option 2 has wetland properties or for any other reason Option 2 is undevelopable, then this report does not object to the development on Option 3, provided that suitable mitigation measures are implemented.

The vegetation at all three Options comprised Klerksdorp Thornveld, however, the vegetation at Option 2 was in a degraded state due to heavy grazing, harvesting of firewood and dumping. As per the SEI analysis, Option 2 scores a lower SEI due to its proximity to existing development and its degraded state. From a vegetation perspective, Option 2 is therefore the preferred site for the substation, although its associated LILO corridor is longer than that of Option 1. However, if the clay depression on Option 2 has wetland properties or for any other reason Option 2 is undevelopable, then this report does not object to the development on Option 1, provided that suitable mitigation measures are implemented. The vegetation sensitivity map (Figure 22). This map must be considered along with the fauna sensitivity map and wetland map (where applicable) to obtain an overall sensitivity map.



**Figure 22:** Vegetation Sensitivity Map

### 6.1.3 Summary of impacts assessed

## 6.2 Avifauna

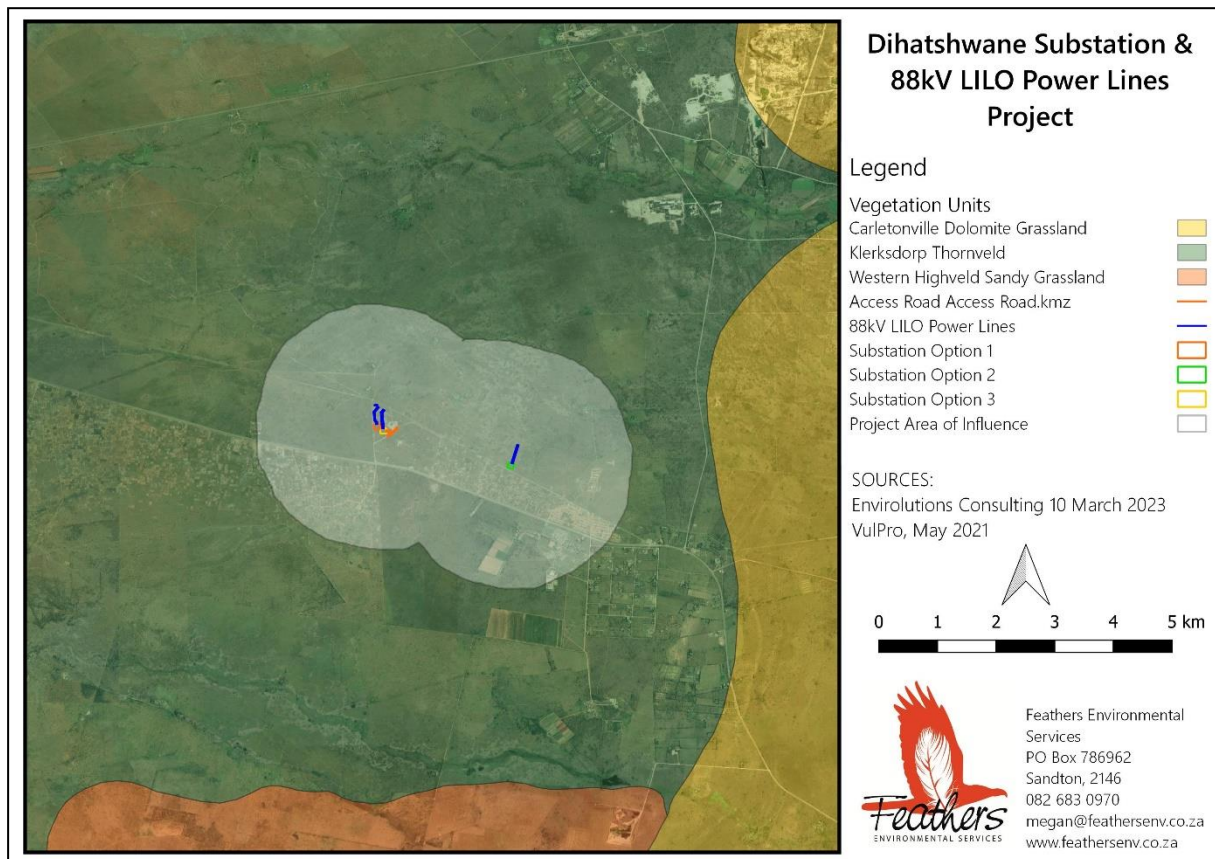
### 6.2.1 Results of the Avifauna Assessment

Vegetation is one of the primary factors determining bird species distribution and abundance in an area. It is widely accepted within ornithological circles that vegetation structure is more important in determining which bird species will occur there. The classification of vegetation types is from Mucina & Rutherford (2006 and 2012), while from an avifaunal perspective, the Atlas of southern African Birds (SABAP1) recognises six primary vegetation divisions or biomes within South Africa, namely (1) Fynbos (2) Succulent Karoo (3) Nama Karoo (4) Grassland (5) Savanna and (6) Forest (Harrison et al. 1997). Whilst much of the distribution and abundance of bird species can be attributed to the broad vegetation types present in an area, it is the smaller spatial scale habitats (micro habitats) that support the requirements of a particular bird species that need to be examined in greater detail. Micro habitats are shaped by factors other than vegetation, such as topography, land use, food availability, and various anthropogenic factors all of which will either attract or deter birds and are critically important in mapping the site in terms of avifaunal sensitivity and ultimately informing mitigation requirements. Assessment of the Dihatshwane Substation and 88kV LILO power lines PAOI revealed three broadly described avifaunal micro habitats i.e. grassland, ephemeral pans and built-up areas. APPENDIX 2 provides a photographic record of the bird habitats.

**Grassland:** The Dihatshwane Substation and 88kV LILO power line alignments are located within a single primary vegetation division namely the Grassland Biome, specifically Klerksdorp Thornveld (**Figure 23**). Klerksdorp Thornveld occurs in two regions, the first in the Wolmaransstad, Ottosdal and Hartebeestfontein region and the other from the Botsolano Game Park north of Mafikeng to the vicinity of Madibogo in the south. Mucina & Rutherford describe the vegetation type as consisting of plains or slightly undulating plains with open to dense *Vachellia karoo* bush clumps in dry grassland. Fairly significant proportions of these vegetation types have been transformed, mostly by cultivation and urbanisation (Mucina & Rutherford, 2006 and 2012).

Grasslands represent a significant foraging area for many bird species. Specifically, open grassland in the broader area could attract the following power line sensitive species Amur Falcon, Greater Kestrel, Lesser Kestrel, Lanner Falcon, Northern Black Korhaan, Pale Chanting Goshawk, Secretarybird and Western Cattle Egret. The grassland patches are also a favourite foraging area for game birds such as francolins, sandgrouse and Helmeted Guineafowl *Numida meleagris*. This in turn attracts large raptors, because of both the presence and accessibility of prey.

It is likely that most of the species mentioned in the preceding paragraph still occur in the PAOI from time to time, especially in areas where the vegetation is still intact (APPENDIX 2). The nature of the vegetation within the development footprint is poor, with evidence of significant overgrazing and pedestrian traffic.



**Figure 23:** Regional map detailing the various vegetation types and river systems occurring within the Dihatshwane Substation and 88kV LILO Power Lines PAOI.

**Ephemeral Pans:** The PAOI also contains small pans which are endorheic wetlands having closed drainage systems; water usually flows in from small catchments but with no outflow from the pan basins themselves. They are typical of poorly drained, relatively flat and dry regions. Water depth is shallow (<3m) with flooding characteristically ephemeral (Harrison *et al.* 1997). When these pans hold water (which is only likely after exceptional rainfall events), they may attract waterbirds, while large raptors could use them for bathing and drinking. When the pans are dry, they may be covered with grass, which is attractive to several large terrestrial species for foraging, roosting and breeding. It is important to note that the pans within the PAOI are relatively small (APPENDIX 2) and are likely a source of drinking water for cattle and goats. It is unlikely that these pans will attract SCC given the disturbance in within the PAOI.

**Built-up Areas and Infrastructure:** These areas include settlements and surface infrastructure such as roads. Built-up areas generally are of little value to SCC due to their degraded nature and the associated disturbance factor, with the possible exception of Lanner Falcon which hunt feral pigeons and (possibly) free-ranging poultry. The impact of the dense human population also spills over in the adjacent habitat classes through the constant movement of pedestrians, cattle and dogs into those areas. This has implications for the avifauna, particularly the larger species, in that it acts as sources of potential disturbance. These areas play an important role in providing safe refuge and foraging opportunities for small passerine species that have become common in urban, peri-urban and rural environments. Again, these species are relatively tolerant of disturbance and are therefore likely to be temporarily displaced from the area during the construction phase of the project.

TABLE 3 in Appendix E4 details the micro habitats that each of the power line sensitive bird species (recorded by SABAP2) will typically frequent in the PAOI. It must be stressed that birds can and will, by virtue of their mobility, utilise almost any areas in a landscape from time to time. However, the analysis in this table represents each species' most preferred habitats. These locations are where most of the birds of that species will spend most of their time which in turn provides an indication of where impacts on those species will be most significant.

### 6.2.2 Site Sensitivity Verification:

The proposed Project Area of Influence (PAOI) is considered to have a HIGH Animal Species sensitivity, based on the possible occurrence of Lappet-faced Vulture *Torgos tracheliotos*. A site sensitivity verification was conducted through the use of a desktop analysis and a field survey, the results of which determine the sensitivity to be LOW within the proposed development footprint. A large proportion of the PAOI is subject to significant levels of disturbance, this is particularly true for the proposed development footprint. Although Lappet-faced Vulture was previously observed within the broader PAOI, during the 15-year SABAP2 survey period, only two individuals were recorded. While the species may traverse across the proposed development footprint and occasionally forage in the area, if a carcass becomes available, it is highly unlikely that area earmarked for the proposed Dihatshwane Substation and 88kV LILO power line alignments will support the breeding requirements of the species, owing to the lack of suitable nesting substrate and the significant levels of anthropogenic disturbance at both substation locations.

The proposed 88kV LILO power lines equate to a maximum length of approximately 0.7km. There are at least eight existing high voltage powerlines and significantly more distribution and reticulation lines totaling hundreds of kilometres within the 30km radius around the proposed 88kV LILO power lines PAOI. The 88kV LILO power lines will increase the total number of existing and planned high voltage lines by a small percentage, therefore the contribution of the proposed 88kV LILO power lines to the cumulative impact of all the high voltage lines is deemed to be of LOW significance. The combined cumulative impact of the existing power lines, i.e. the 88kV LILO power lines and all future proposed power lines on avifauna within a 30km radius is considered to be of MEDIUM significance.

The habitat within which the PAOI is located is considered to have a LOW sensitivity. In recent years, anthropogenic impacts, mostly in the form of settlement, agricultural and pastoral activities have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the PAOI. The construction of the Dihatshwane Substation and 88kV LILO power lines will result in impacts of MEDIUM-LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. It is anticipated that the Dihatshwane Substation and 88kV LILO power lines can be constructed with acceptable levels of impact on the resident avifauna, subject to the recommendations made in the study.

Refer to **Appendix E4** for the comprehensive Avifauna Assessment.

### 6.2.3 Summary of impacts assessed

Poorly sited or designed facilities and infrastructure can negatively impact not only vulnerable species and habitats, but also entire ecological processes. The effects of any development on birds are highly variable and depend on a wide range of factors including the specification of the development, the topography of the surrounding land, the habitats affected and the number and diversity of species

present. With so many variables involved, the impacts of each development must be assessed individually. Each of these potential effects can interact, either increasing the overall impact on birds or, in some cases, reducing a particular impact (for example where habitat loss and disturbance causes a reduction in birds using an area which may then reduce the risk of collision). The principal areas of concern for SCC and non-SCC substation and power line sensitive species are:

## **Construction Phase**

### ***Displacement as a result of habitat loss or transformation:***

During the construction of powerlines, service roads (jeep tracks), substations and other associated infrastructure, habitat destruction/transformation inevitably takes place. This impact is dependent on various factors i.e., the location and the scale of the facility, the amount of habitat affected; the uniqueness of the habitat; and the sensitivity and conservation status of the bird species utilizing that habitat. Habitat will be cleared to accommodate the Dihatshwane Substation and to a limited extent the 88kV tower/pylon footprints, reducing the amount of habitat available to birds for foraging, roosting and breeding (Smallie, 2013) which could result in temporary or permanent displacement. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the natural habitat within the construction footprint of the substation is unavoidable. In the case of the 88kV LILO power lines, the direct habitat transformation is limited to the tower footprints and the narrow access road/track under the power line. The habitat in the study area is highly uniform from a bird impact perspective and in addition to the low SCC abundances, the displacement impact will not be of regional or national significance.

### ***Displacement 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 Dihatshwane Substation and 88kV LILO 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 development area is already subjected to a degree of disturbance in the form of settlement, and pastoral activities, the existing power line network, in addition to vehicle and pedestrian traffic. Construction activities within the PAOI are likely to result in the temporary displacement as opposed to permanent displacement of species from the area. Each of the power line sensitive species has the potential to be displaced by the construction of the Dihatshwane Substation and 88kV LILO power lines as a result of disturbance. However, many of these species have persisted despite existing disturbance within the PAOI. This resilience, coupled with the fact that similar habitat is available throughout the broader area, means that the displacement impact will not be of regional or national significance.

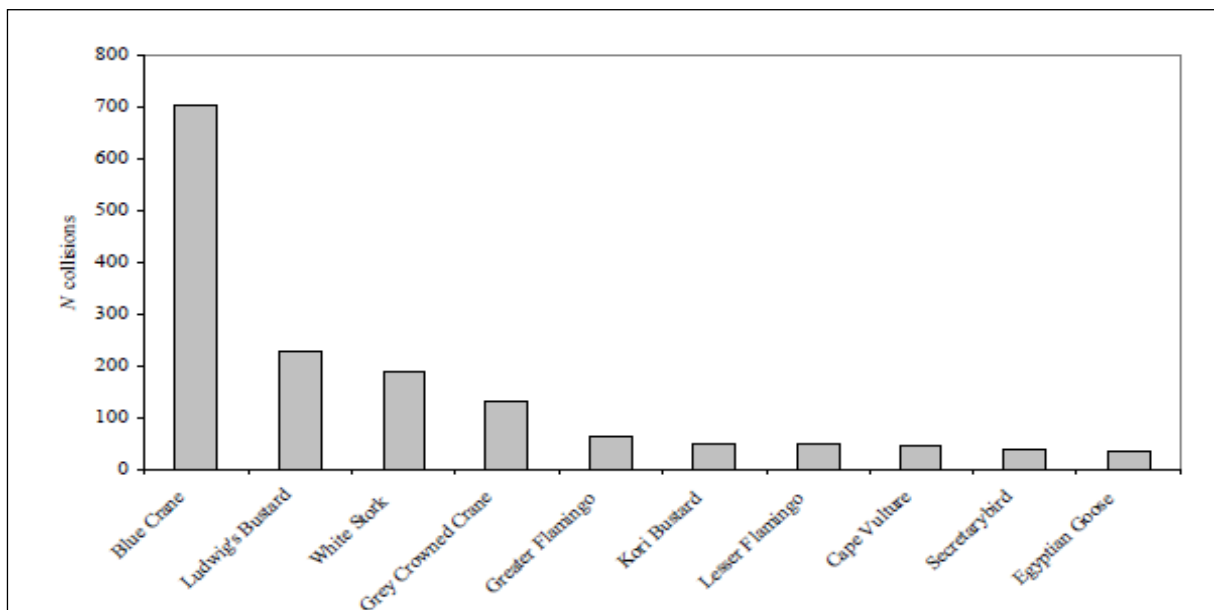
### ***Direct mortality as a result of construction activities:***

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 field survey.

## **Operational Phase**

### ***Mortality due to collisions with the 88kV power line conductors/earthwires:***

Collisions are the biggest single threat posed by power lines to birds in southern Africa (van Rooyen 2004). Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds. These species are mostly heavy-bodied birds with limited manoeuvrability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines (van Rooyen 2004, Anderson 2001). Unfortunately, many of the collision sensitive species are considered threatened in southern Africa. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because a number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth. However, from incidental record keeping by the Endangered Wildlife Trust: Wildlife & Energy Programme it is possible to give a measure of what species are likely to be impacted upon (see **Figure 24** below - Jenkins et al. 2010). This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for any specific line. Relevant to this LILO power line development, collisions may occur, but are likely to be infrequent given the short length of power line (i.e. 0.35km), the location of the loop-in and loop-out power lines directly adjacent to each other and the power lines proximity to the existing power high voltage power lines within the PAOI thereby reducing the risk of collisions to birds. The reasons for that are two-fold, namely it creates a more visible obstacle to birds and the resident birds, particularly breeding adults, which are accustomed to an obstacle in that geographic location and have learnt to avoid it (APLIC 2012; Sundar & Choudhury 2005).



**Figure 24::** The top ten collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/EWT Strategic Partnership central incident register 1996 - 2007 (Jenkins et al. 2010)

### ***Mortality due to electrocutions on the 88kV power line infrastructure:***

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 and design of the tower/pole structure and mainly affects larger,



perching species that are capable of spanning the spaces between energized components. This is particularly likely when more than one bird attempts to sit on the same pole, a behaviour that is typical of gregarious vulture species when perching or roosting. If the proposed 88kV LILLO power lines are constructed using a 132kV steel monopole specification, the clearance distances between the live components and/or live and earthed components of the 132kV tower structure should be sufficient to reduce the risk of electrocutions for most raptor species. However, this is not the case for the vulture species recorded in the PAOI. The best possible mitigation is the construction of the power line using an Eskom approved bird friendly pole/tower design (DT 7641/7649) accordance with the Distribution Technical Bulletin relating to bird friendly structures (APPENDIX 4). Additional mitigation in the form of insulating sleeves on *jumpers* present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.

***Mortality due to electrocutions on the infrastructure within the substation:***

Electrocutions within the proposed Dihatshwane Substation are possible but should not affect the more sensitive SCC as these species are unlikely to use the infrastructure within the substation yards for perching or roosting. Since it is difficult to predict with any certainty where birds are likely to nest within the substation yards, coupled with the costs associated with insulating the entire substation, electrocutions will need to be mitigated using site-specific recommendations if and when they occur.

***Impact on the quality of electrical supply:***

Although this does not form part of the brief, it is important to mention that birds could have an impact on the proposed power line infrastructure. 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. The construction of the power line using the steel monopole structure will minimise this impact in that limited perching space on the structure is available to the vultures that will readily utilise the power line towers on which to roost. Site specific mitigation can be applied reactively should this impact occur post construction.

Bird nests may also cause faults through nest material, protruding into the air gap between live components on the power line 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. Apart from the cost of replacing damaged equipment, the resultant veld fire can lead to claims for damages from landowners. 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 on the power line infrastructure. Site specific mitigation (i.e. bird guards) can be applied reactively should this impact occur.

**Decommissioning & Closure Phases**

***Displacement as a result of disturbance:***

The PAOI is already subjected to a degree of disturbance associated with the informal settlement and pastoral activities. While the decommissioning of the Dihatshwane Substation and 88kV LILLO power lines in this area will undoubtedly displace some species, the bird species likely to occupy this area, and the fact that similar habitat is available within the broader PAOI, displacement as a result of disturbance is unlikely to be permanent and of national significance.

## 7. ASSESSMENT OF POTENTIAL IMPACT

### 7.1 Impact Assessment Methodology

The following methodology and criteria were used in assessing impacts related to the proposed development.

The following methodology and criteria was used in assessing impacts related to the proposed development.

- The **Nature**, a description of what causes the effect, what will be affected, and how it will be affected.
- The **Extent**, wherein it is indicated whether:
  - 1 is limited to the immediate area or site of development
  - 2 is the local area
  - 3 is regional
  - 4 is national
  - 5 is international
- The **Duration**, wherein it is indicated whether:
  - The lifetime of the impact will be of a very short duration (0–1 years) – assigned a score of 1;
  - The lifetime of the impact will be of a short duration (2-5 years) - assigned a score of 2;
  - Medium-term (5–15 years) – assigned a score of 3;
  - Long term (> 15 years) - assigned a score of 4; or;
  - Permanent - assigned a score of 5.
- The **Magnitude**, quantified on a scale from 0-10, where a score is assigned:
  - 0 is small and will have no effect on the environment;
  - 2 is minor and will not result in an impact on processes;
  - 4 is low and will cause a slight impact on processes;
  - 6 is moderate and will result in processes continuing but in a modified way;
  - 8 is high (processes are altered to the extent that they temporarily cease); and
  - 10 is very high and results in complete destruction of patterns and permanent cessation of processes.
- The **Probability** of occurrence, which describes the likelihood of the impact actually occurring. Probability is estimated on a scale, and a score assigned:
  - Assigned a score of 1–5, where 1 is very improbable (probably will not happen);
  - Assigned a score of 2 is improbable (some possibility, but low likelihood);
  - Assigned a score of 3 is probable (distinct possibility);
  - Assigned a score of 4 is highly probable (most likely); and
  - Assigned a score of 5 is definite (impact will occur regardless of any prevention measures).
- The **Significance**, which is determined through a synthesis of the characteristics described above (refer formula below) and can be assessed as low, medium or high.
  - The status, which is described as **positive, negative or neutral**.
  - The degree to which the impact can be reversed.
  - The degree to which the impact may cause irreplaceable loss of resources.
  - The degree to which the impact can be mitigated.

The significance is determined by combining the criteria in the following formula:

**S= (E+D+M) P;** where

S = Significance weighting

E = Extent

D = Duration

M = Magnitude

P = Probability

The significance weightings for each potential impact are as follows:

- **< 30 points:** (i.e. where this impact would not have a direct influence on the decision to develop in the area),
- **31-60 points:** (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
- **> 60 points:** (i.e. where the impact must have an influence on the decision process to develop in the area).

The specialist findings presented in this section represents a summary of the detailed and original specialist studies contained in the relevant appendices to this report (**Appendices E**) The current summary of specialist findings is provided in the interest of brevity and with a view to facilitating public participation; as contemplated in the NEMA principles. The Competent Authority, with its mandate of substantive review of the EIA report, is therefore urged to also read the original specialist studies in the relevant appendices to this report with the aim of discharging its decision-making function. ***Should any discrepancy occur between this summary, and the relevant detailed specialist study; the detailed specialist study will prevail.***

## 7.2 Substation Site Alternative Evaluation

Both the Substation Alternative 1 and Alternative 2 may create impacts that might be negative to the receiving environment. The magnitude of the impacts and the type of environment that will be influenced must be comparatively evaluated in order to recommend an option and focus the specialist studies. The specialist studies' focus was to assist the EAP to understand the nature of the impacts and develop mitigation options for the recommended route.

In most case the two alternative sites do not differ in significant however where application, the differences in significance are comparatively assessed in **Table 8 and 9**. Where applicable, the **Substation Option 1 is highlighted in purple**; **Substation Option 2 in Blue**. and **Substation Option 3 is highlighted in Red**.

### 7.3 Impact Assessment Tables

#### 7.3.1 Construction Phase

**Table 8:** Construction Phase Impacts

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p><b>Nature of the Impact:</b> <u>Impact to possible wetland.</u></p> <p>Impact not application to Substation <b>Option 1</b> and <b>Option 3</b></p> <p><b>Option 2</b></p> <table border="1" data-bbox="203 679 824 1029"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Definite (5)</td> </tr> <tr> <td><b>Duration</b></td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site and Surrounds (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>55 (Medium)</b></td> <td><b>40 (Medium)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Definite (5)	Definite (5)	<b>Duration</b>	Permanent (5)	Permanent (5)	<b>Extent</b>	Site and Surrounds (2)	Site (1)	<b>Magnitude</b>	Low (4)	Minor (2)	<b>Significance</b>	<b>55 (Medium)</b>	<b>40 (Medium)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>Substation Option 1 and 3 is preferred as there are no wetlands within 500m from the site. Substation Option 2 is close to a possible wetland, which may still have wetland characteristics and if so, must be conserved.</li> </ul>	<p>Medium</p>
Description	Without Mitigation	With Mitigation																					
<b>Probability</b>	Definite (5)	Definite (5)																					
<b>Duration</b>	Permanent (5)	Permanent (5)																					
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<b>Status (positive or negative)</b>	Negative	Negative																					
<p><b>Nature of the Impact:</b> <u>Clearing of very-low and low Site Ecological Importance (SEI).</u> The development will require the removal of the vegetation at the substation footprint, as well as portions of the LILO powerline corridors.</p> <p><b>Source:</b></p> <ul style="list-style-type: none"> <li>Clearing of and damage to vegetation in construction footprint, access roads, construction camps, vehicle / machinery traffic and trampling by workers;</li> <li>Illegal disposal and dumping of construction material such as cement or oil, as well as maintenance materials during construction.</li> </ul>	<ul style="list-style-type: none"> <li>Substation Option 2 is preferred as there are more disturbances to vegetation as a result of the close proximity to the Rooigrond community.</li> <li>Plant to fence the site prior to commencement of activities, to prevent edge effects.</li> <li>Remove alien and invasive plant species as listed on 18 September 2020 in the list of Alien Invasive Species published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government</li> </ul>	<p>Medium</p>																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Definite (5)</td> </tr> <tr> <td><b>Duration</b></td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site and Surrounds (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>55 (Medium)</b></td> <td><b>40 (Medium)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Definite (5)	Definite (5)	<b>Duration</b>	Permanent (5)	Permanent (5)	<b>Extent</b>	Site and Surrounds (2)	Site (1)	<b>Magnitude</b>	Low (4)	Minor (2)	<b>Significance</b>	<b>55 (Medium)</b>	<b>40 (Medium)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<p>Gazette No 43726 of 2020) from the modified land under jurisdiction of the landowner.</p> <ul style="list-style-type: none"> <li>• An independent Environmental Control Officer (ECO) should be appointed to oversee construction.</li> <li>• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area or any natural areas outside of the construction footprint.</li> <li>• Formalise access roads and make use of existing roads and tracks where feasible, rather than creating new routes through naturally vegetated areas.</li> <li>• Prevent spillage of construction material and other pollutants, contain, and treat any spillages immediately, strictly prohibit any pollution/littering. Ensure there is a method statement in place to remedy any accidental spillages immediately.</li> <li>• Where topsoil needs to be removed, store such in a separate area where such soils can be protected until they can be re-used for post-construction rehabilitation where applicable. Never mix topsoil with subsoils or other spoil materials.</li> <li>• After construction, the land must be cleared of rubbish, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that prior to construction.</li> <li>• Limit clearing of vegetation in the LILO footprint to the absolute minimum (e.g., around the base of pylons) and prevent trampling and compaction in areas not cleared.</li> </ul>	
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Definite (5)	Definite (5)																							
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<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> <u>Removal / Destruction of protected plants and plants of conservation concern.</u>                      Development could impact on suitable habitat to plant species of conservation concern. Such species were not confirmed to occur; however, suitable habitat is present. Declining and provincially protected species will also be impacted; however, these can be relocated to suitable habitat on the site, but outside of the development footprint, to ensure their persistence.</p>			<ul style="list-style-type: none"> <li>• The <i>Boophone distichia</i> species was recorded south of the Option 1 site and along the existing distribution line. These species are unlikely to be impacted on but must be relocated to outside of the development footprint if it will be impacted on.</li> <li>• A provincially protected succulent was recorded west of the Option 2 LILO corridor. If this species is to be impacted on,</li> </ul>	Medium																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																																										
<p><b>Option 1 and Option 3</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Medium term (3)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Low (4) Only if plants are avoided or relocated, else rating stays at 6</td> </tr> <tr> <td><b>Significance</b></td> <td><b>33 (Medium)</b></td> <td><b>14 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table> <p><b>Option2</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>High (8)</td> <td>Moderate (6)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>42 (Medium)</b></td> <td><b>20 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Medium term (3)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	Moderate (6)	Low (4) Only if plants are avoided or relocated, else rating stays at 6	<b>Significance</b>	<b>33 (Medium)</b>	<b>14 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Medium term (3)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	High (8)	Moderate (6)	<b>Significance</b>	<b>42 (Medium)</b>	<b>20 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<p>or found elsewhere in the proposed footprint, it should be relocated with the permission of the local authority.</p> <ul style="list-style-type: none"> <li>If the clay depression on Option 2 is confirmed by the wetland specialist to have wetland characteristics, then it may be suitable habitat to a Vulnerable species. If any development will impact thereon, then a terrestrial plant assessment as per the protocols for a terrestrial plant species assessment, as published in the Government Gazette No 43855 on 30 October 2020 in terms of sections 24(5)(a) and 25 (5)(h) of NEMA should be undertaken. This must be done prior to construction. If a plant species of conservation concern is recorded on the site, the treat status of such species will determine the size of a buffer area around the population (SANBI, 2020).</li> <li>The ECO should take note of any unearthed geophytes and contact a specialist for the correct naming and threat status of the species. This will determine whether any follow-up action is required.</li> <li>All succulent species unearthed during construction must be relocated to outside of the development footprint. A specialist should be consulted as to the species and suitable method and locality for relocation.</li> <li>Construction workers may not tamper or remove these plants, and neither may anyone collect seed from the plants without permission from the local authority.</li> </ul>	
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POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p><b>Nature of the Impact:</b> <u>Potential increase in alien and invasive vegetation.</u>                      The seed of alien invasive plant species that occur on and in the vicinity of the construction areas could spread into the disturbed and stockpiled soil. Also, the construction vehicles and equipment were likely used on various other sites and could introduce alien invasive plant seeds or indigenous plants not belonging to this vegetation unit to the construction site. In addition, if rehabilitation of the indigenous vegetation around the development are unsuccessful or is not enforced, exotic and invasive vegetation may further invade the area.</p> <p><b>Both Options</b></p> <table border="1" data-bbox="203 624 824 943"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Probable (3)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>High (8)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>70 (High)</b></td> <td><b>21 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Definite (5)	Probable (3)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	High (8)	Low (4)	<b>Significance</b>	<b>70 (High)</b>	<b>21 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>• Alien invasive species, in particular category 1b species that were identified within the study area, should be removed from the development footprint and immediate surrounds, prior to construction or soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.</li> <li>• All alien seedlings and saplings must be removed as they become evident for the duration of construction.</li> <li>• All construction vehicles and equipment, as well as construction material should be free of plant material. Therefore, all equipment and vehicles should be thoroughly cleaned prior to access on to the construction areas. This should be verified by the ECO.</li> <li>• If filling material is to be used, this should be sourced from areas free of invasive species.</li> </ul>	<p>Medium</p>
Description	Without Mitigation	With Mitigation																					
<b>Probability</b>	Definite (5)	Probable (3)																					
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<b>Status (positive or negative)</b>	Negative	Negative																					
<p><b>Nature of the Impact:</b> <u>Bush densification.</u>                      Bushveld is prone to bush densification whereby open bushveld, in the absence of good veld management, become denser and dominated by stands of encroacher species e.g. "stands of plants of the kinds specified in Table 4 of Regulation 16 (CARA), where individual plants are closer to each other than three times the mean crown diameter" (Agricultural Research Council, 2013). Plants in this group are not alien plants, but indigenous plants that tend to become abnormally abundant when the area is degraded (Agricultural Research Council, 2013). The plants themselves are thus not the problem, but their increased abundance or encroachment into bushveld serves as an indicator of poor land management practices. Disturbances and a lack of fire can result in species such as <i>Vachellia karroo</i> and <i>Searsia lancea</i> and <i>S ciliata densifying</i> in the surrounding landscape.</p>	<ul style="list-style-type: none"> <li>• Substation Option 2 is preferred as there are more disturbances to vegetation as a result of the close proximity to the Rooigrond community.</li> <li>• The substation and powerlines must be protected from fire (e.g. sprinkler systems around the facilities boundary), without suppressing natural fires within the open vegetation.</li> <li>• Do not disturb soil unnecessary and do not disturb vegetation or soils beyond the site boundary.</li> <li>• Ensure that areas outside of the operational footprint that were disturbed, are adequately rehabilitated and that dense stands of encroacher species are prevented.</li> </ul>	<p>Medium</p>																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p><b>Option 1</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>36 (Medium)</b></td> <td><b>14 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	Moderate (6)	Low (4)	<b>Significance</b>	<b>36 (Medium)</b>	<b>14 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative		
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<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste.                      All contaminating substances, including waste, must be handled properly on site to prevent contamination of surrounding habitats through contaminated runoff.</p>			<ul style="list-style-type: none"> <li>• Either Substation Option 1 or 3 is preferred as there are more disturbances to fauna habitat in this area.</li> <li>• Discontinue use of all faulty machinery / equipment on site until properly repaired.</li> <li>• Due to proximity of petrol stations, hydrocarbon storage on site should be limited to daily needs only.</li> <li>• Plan and implement a proper stormwater management plan from the onset.</li> </ul>	Medium																					
<p><b>Option 1</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>					Description	Without Mitigation	With Mitigation																		
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POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<b>Probability</b>	Highly Probable (4)	Improbable (2)	<ul style="list-style-type: none"> <li>Facilities will be provided for storage of all hazardous substances and waste to prevent the exposure of these substances to the environment. These will be erected on site before any substances are brought to site. The aim is to PREVENT exposure of fauna to any potential toxin.</li> <li>All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks.</li> <li>All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. Refuse bins with properly secured lids will be placed on site to collect waste for separation, recycling and disposal.</li> <li>Cement bags will be stored under a tarpaulin and on an impervious sheet. Cement mixing will take place within a designated flat area only.</li> <li>All hydrocarbons and cement spills on bare ground will be cleared immediately.</li> <li>Inspect and clear all litter and waste from the site and surrounds.</li> </ul>	
<b>Duration</b>	Medium term (3)	Short term (2)		
<b>Extent</b>	Local (2)	Site (1)		
<b>Magnitude</b>	High (8)	Low (4)		
<b>Significance</b>	52 (Medium)	14 (Low)		
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Option 2</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>	<ul style="list-style-type: none"> <li>Substation Option 2 is subject to higher levels of disturbance and is less likely to attract avian priority species and is therefore preferred.</li> <li>Avoid removal of sensitive vegetation types. The recommendations of the Terrestrial vegetation assessment; must be strictly implemented, especially as far as limitation</li> </ul>	Medium
<b>Probability</b>	Highly Probable (4)	Improbable (2)		
<b>Duration</b>	Medium term (3)	Short term (2)		
<b>Extent</b>	Local (2)	Site (1)		
<b>Magnitude</b>	High (8)	Low (4)		
<b>Significance</b>	52 (Medium)	14 (Low)		
<b>Status (positive or negative)</b>	Negative	Negative		
<p><b>Nature of the Impact:</b> Displacement of SCC and non-SCC priority species as a result of habitat loss &amp; transformation</p> <p>During the construction of powerlines, service roads (jeep tracks), substations and other associated infrastructure, habitat destruction/transformation inevitably takes place. This impact is dependent on various factors i.e., the location and the scale of the facility, the amount of habitat affected; the uniqueness of the habitat; and the</p>				

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																																	
<p>sensitivity and conservation status of the bird species utilizing that habitat. Habitat will be cleared to accommodate the Dihatshwane Substation and to a limited extent the 88kV tower/pylon footprints, reducing the amount of habitat available to birds for foraging, roosting and breeding which could result in temporary or permanent displacement. Unfortunately, very little mitigation can be applied to reduce the significance of this impact as the total permanent transformation of the natural habitat within the construction footprint of the substation is unavoidable. In the case of the 88kV LILO power lines, the direct habitat transformation is limited to the tower footprints and the narrow access road/track under the power line. The habitat in the study area is highly uniform from a bird impact perspective and in addition to the low SCC abundances, the displacement impact will not be of regional or national significance.</p> <p><b>Option 1</b> and <b>Option 3</b></p> <table border="1" data-bbox="203 778 824 1129"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Highly Probable (4)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Long term (4)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>44 (Medium)</b></td> <td><b>18 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table> <p><b>Option 2</b></p> <table border="1" data-bbox="203 1193 824 1377"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Highly Probable (4)	Improbable (2)	<b>Duration</b>	Long term (4)	Long term (4)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Moderate (6)	Low (4)	<b>Significance</b>	<b>44 (Medium)</b>	<b>18 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Medium term (3)	<b>Extent</b>	Site (1)	Site (1)	<p>of the construction footprint and rehabilitation of disturbed areas is concerned.</p> <ul style="list-style-type: none"> <li>• Construction activity should be restricted to the immediate footprint of the infrastructure.</li> <li>• All construction activities should be strictly managed according to generally accepted environmental best practice standards, so as to avoid any unnecessary impact on the receiving environment.</li> <li>• All temporary disturbed areas should be rehabilitated according to the site’s rehabilitation plan, following construction.</li> <li>• Maximum use should be made of existing access roads and the construction of new roads should be kept to a minimum.</li> </ul>	
Description	Without Mitigation	With Mitigation																																	
<b>Probability</b>	Highly Probable (4)	Improbable (2)																																	
<b>Duration</b>	Long term (4)	Long term (4)																																	
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POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED												
<b>Magnitude</b>	Moderate (6)	Low (4)														
<b>Significance</b>	<b>33 (Medium)</b>	<b>16 (Low)</b>														
<b>Status (positive or negative)</b>	Negative	Negative														
<p><b>Nature of the Impact:</b> <u>Displacement of SCC and non-SCC priority species as a result of disturbance.</u>                      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 Dihatshwane Substation and 88kV LILO 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 development area is already subjected to a degree of disturbance in the form of settlement, and pastoral activities, the existing power line network, in addition to vehicle and pedestrian traffic. Construction activities within the PAOI are likely to result in the temporary displacement as opposed to permanent displacement of species from the area. Each of the power line sensitive species has the potential to be displaced by the construction of the Dihatshwane Substation and 88kV LILO power lines as a result of disturbance. However, many of these species have persisted despite existing disturbance within the PAOI. This resilience, coupled with the fact that similar habitat is available throughout the broader area, means that the displacement impact will not be of regional or national significance.</p> <p><b>Option 1 and Option 3</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Highly Probable (4)</td> <td>Probable (3)</td> </tr> <tr> <td><b>Duration</b></td> <td>Short term (2)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Highly Probable (4)	Probable (3)	<b>Duration</b>	Short term (2)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<ul style="list-style-type: none"> <li>Substation Option 2 is subject to significant levels of disturbance and is less likely to attract avian priority species and is therefore preferred.</li> <li>Access to the remainder of the site should be strictly controlled to prevent unnecessary disturbance of priority species.</li> <li>Measures to control noise should be applied according to current best practice in the industry.</li> </ul>	Medium
Description	Without Mitigation	With Mitigation														
<b>Probability</b>	Highly Probable (4)	Probable (3)														
<b>Duration</b>	Short term (2)	Short term (2)														
<b>Extent</b>	Local (2)	Site (1)														

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<b>Magnitude</b>	Moderate (6)	Low (4)		
<b>Significance</b>	<b>40 (Medium)</b>	<b>21 (Low)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Option 2</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>		
<b>Probability</b>	Probable (3)	Improbable (2)		
<b>Duration</b>	Short term (2)	Short term (2)		
<b>Extent</b>	Local (2)	Site (1)		
<b>Magnitude</b>	Moderate (6)	Low (4)		
<b>Significance</b>	<b>30 (Low)</b>	<b>14 (Low)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Nature of the Impact:</b> <u>Loss and disturbance of heritage sites due to the development.</u>			<ul style="list-style-type: none"> <li>Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.</li> </ul>	Low
<b>Both Options</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>		
<b>Probability</b>	Very improbable (1)	Very improbable (1)		
<b>Duration</b>	Permanent (5)	Permanent (5)		
<b>Extent</b>	Site (1)	Site (1)		
<b>Magnitude</b>	Minor (2)	Minor (2)		
<b>Significance</b>	<b>8 (Low)</b>	<b>8 (Low)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p>As no sites, features or objects of cultural significance are known to exist in the development area, there would be no impact as a result of the proposed development.</p>																							
<p><b>Nature of the Impact:</b> Loss and disturbance to palaeontology due to the development.</p> <p><b>Both Options</b></p> <table border="1" data-bbox="201 563 826 912"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Very improbable (1)</td> <td>Very improbable (1)</td> </tr> <tr> <td><b>Duration</b></td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Minor (2)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>8 (Low)</b></td> <td><b>8 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Very improbable (1)	Very improbable (1)	<b>Duration</b>	Permanent (5)	Permanent (5)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Minor (2)	Minor (2)	<b>Significance</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>• If any palaeontological material is exposed during clearing, digging, excavating, drilling or blasting SAHRA must be notified. All construction activities must be stopped, a 30m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures; especially shallow caves.</li> <li>• A Phase 2 Palaeontological Mitigation is only required if fossils are found during construction.</li> <li>• Protocol for finds must be followed.</li> <li>• It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.</li> </ul>	<p>Medium</p>
Description	Without Mitigation	With Mitigation																					
<b>Probability</b>	Very improbable (1)	Very improbable (1)																					
<b>Duration</b>	Permanent (5)	Permanent (5)																					
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<b>Significance</b>	<b>8 (Low)</b>	<b>8 (Low)</b>																					
<b>Status (positive or negative)</b>	Negative	Negative																					
<p><b>Nature of Impact:</b> Visual                      Surface disturbances and the presence of a construction team are uncharacteristic events in the study area and may cause unsightly views as a result of the activity to the property owners as well as neighbouring property owners.                      Introduction of construction equipment, ground staff, construction vehicles and equipment that is unfamiliar in the baseline environment.                      Source of Impact:</p> <ul style="list-style-type: none"> <li>• Construction vehicles.</li> <li>• Construction material.</li> <li>• Barricading and fencing.</li> <li>• Rubble on site.</li> <li>• Construction crew.</li> </ul> <p><b>Option 1 and Option 3</b></p> <table border="1" data-bbox="201 1326 826 1383"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation				<ul style="list-style-type: none"> <li>• Either Substation Option 1 or 3 is preferred as it is within and surrounded by open land; whereas Substation Option 2 is within close proximity to the Rooigrond community and the visual impact during construction will be high.</li> <li>• Construction vehicles should only park in designated areas.</li> <li>• Waste to be kept only at specific sites on site and to be removed weekly.</li> <li>• Construction camp or laydown yards must be completely screened from sensitive viewpoints. Preferably, construction camps should be in a dedicated construction camp in an area that is already disturbed.</li> <li>• Avoid the construction of additional access roads by keeping to existing roads where possible.</li> </ul>	<p>High</p>															
Description	Without Mitigation	With Mitigation																					

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<b>Probability</b>	Definite (5)	Highly Probable (4)	<ul style="list-style-type: none"> <li>Avoid removal of any large trees or shrubs that may open views to the construction site and compromise the natural screening capacity of the study area.</li> <li>Clearly demarcate the construction site to limit the area of disturbance.</li> <li>Keep dust levels down by regularly wetting dirt roads and exposed soil areas.</li> <li>Remove rubble and other waste that is generated by the construction process as soon as possible and dispose at an appropriate dump site.</li> <li>Keep the construction camp neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of sight from sensitive viewpoints.</li> <li>Enhance screening of the construction camps by erecting a temporary fence with a 3m high shade cloth to limit the intrusive nature of such a site.</li> </ul>	
<b>Duration</b>	Medium term (3)	Short term (2)		
<b>Extent</b>	Site (1)	Site (1)		
<b>Magnitude</b>	High (8)	Moderate (6)		
<b>Significance</b>	<b>60 (Medium)</b>	<b>36 (Medium)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Option 2</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>	<ul style="list-style-type: none"> <li>Substation Option 1/3 is preferred as it is within and surrounded by open land; whereas Substation Option 2 is within close proximity to the Rooigrond community and the construction (including construction vehicles and machinery) will result in a higher dust exposure to the community.</li> <li>Vegetation clearance should be kept to a minimum (only where necessary).</li> <li>Wet all unprotected cleared areas and stockpiles with water to suppress dust pollution during dry and windy periods.</li> </ul>	Medium
<b>Probability</b>	Definite (5)	Highly Probable (4)		
<b>Duration</b>	Medium term (3)	Short term (2)		
<b>Extent</b>	Local (2)	Site (1)		
<b>Magnitude</b>	High (8)	Moderate (6)		
<b>Significance</b>	<b>65 (High)</b>	<b>36 (Medium)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		
<p><b>Nature of Impact: Dust Generation</b>                      Construction machinery and heavy vehicles which are likely to make use of the existing gravel roads to transport equipment and material to the construction site, are likely to generate dust which is likely to be perceptible by affected properties. Trucks may potentially distribute dust along internal access roads as well as into the watercourse given the nature of the activities.                      Source of Impact:</p> <ul style="list-style-type: none"> <li>Clearing of vegetation.</li> <li>Construction vehicles.</li> </ul>				

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Description	Without Mitigation	With Mitigation																							
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<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of Impact:</b> <u>Crime, safety and security</u>  <b>Source of Impact:</b></p> <ul style="list-style-type: none"> <li>Lack of security.</li> <li>Easy access.</li> <li>Construction area not enclosed.</li> <li>Poorly trained personnel using equipment and vehicles.</li> </ul>			<ul style="list-style-type: none"> <li>Substation Option 3 is the preferred as it is within and surrounded by open land; whereas Substation Option 2 is within close proximity to the Rooigrond community and the construction (including construction vehicles and machinery) will result in more noise pollution to the community.</li> </ul>	Medium																					

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<p><b>Nature of Impact:</b> <u>Noise</u>                      Source of Impact:</p> <ul style="list-style-type: none"> <li>• Construction vehicles.</li> <li>• Equipment and machinery.</li> </ul>			<ul style="list-style-type: none"> <li>• Substation Option 1 or 3 is preferred as it is within and surrounded by open land; whereas Substation Option 2 is within close proximity to the Rooigrond community and the construction (including construction vehicles and machinery) can have a safety risk to them</li> <li>• Construction and the use of construction machinery should be limited between 06h00 and 18h00 on weekdays only.</li> </ul>	High																																										



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<p><b>Nature of impact:</b> <u>Traffic and accessibility</u></p> <ul style="list-style-type: none"> <li>• Anticipated impact on traffic owing to construction vehicles and heavy vehicles delivering materials to the site.</li> <li>• Traffic congestion in and around the area may offend locals and road users during the construction phase.</li> </ul>	<ul style="list-style-type: none"> <li>• Either Substation Option 1 or 3 is preferred as it is within and surrounded by open land; whereas Substation Option 2 is within close proximity to the Rooigrond community and the construction vehicles moving in and out of the area can cause a traffic hindrance.</li> </ul>	Medium																																										

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<b>Status (positive or negative)</b>	Negative	Negative																																										
<p><b>Nature of impact:</b> Pollution due to inappropriate handling of generated waste on site. Waste generation could have negative impacts on the environment if not controlled adequately. Waste streams likely to include domestic waste, spent grinding material, mixed concrete, paint cans and brushes, construction rubble and other construction waste.</p>	<ul style="list-style-type: none"> <li>• Either Substation Option 1 or 3 is preferred as there are no wetlands within 500m from the site. Substation Option 2 is close to an artificial wetland, which still has wetland characteristics and must be conserved.</li> </ul>	Medium																																										

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Description	Without Mitigation	With Mitigation																																												
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<b>Status (positive or negative)</b>	Negative	Negative																																												
<p><b>Nature of impact:</b> Socioeconomic  <b>Source of Impact:</b></p> <ul style="list-style-type: none"> <li>Job creation for local skilled labour, general labour and suppliers.</li> <li>Skills development.</li> </ul>			<ul style="list-style-type: none"> <li>General and skilled locals must be considered for employment during construction (contractor and construction crew).</li> <li>Local suppliers must be considered for the purchase of construction material.</li> </ul>	Low (Positive)																																										

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<b>Both Options</b>				
<b>Description</b>	<b>Without Enhancement</b>	<b>With Enhancement</b>		
<b>Probability</b>	Probable (3)	Highly Probable (4)		
<b>Duration</b>	Short term (2)	Short term (2)		
<b>Extent</b>	Local (2)	Local (2)		
<b>Magnitude</b>	Low (4)	Moderate (6)		
<b>Significance</b>	<b>24 (Low)</b>	<b>40 (Medium)</b>		
<b>Status (positive or negative)</b>	Positive	Positive		

7.3.2 Operational Impacts

Table 9: Operational Phase Impacts

POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<p><b>Nature of the Impact:</b> <u>Impact to possible wetland.</u></p> <p>Impact not application to Substation <b>Option 1</b> and <b>Option 3</b></p> <p><b>Option 2</b></p> <table border="1" data-bbox="203 638 824 957"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Short term (2)</td> <td>Temporary (1)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>21 (Low)</b></td> <td><b>8 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Short term (2)	Temporary (1)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Low (4)	Minor (2)	<b>Significance</b>	<b>21 (Low)</b>	<b>8 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>With regards to maintenance activities to the substation and LILO, either Substation Option 1 or 3 is preferred as there are no wetlands within 500m from the site. Substation Option 2 is close to a possible wetland, which may still have wetland characteristics and if so, must be conserved.</li> </ul>	<p>Low</p>
Description	Without Mitigation	With Mitigation																					
<b>Probability</b>	Probable (3)	Improbable (2)																					
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<b>Status (positive or negative)</b>	Negative	Negative																					
<p><b>Nature of Impact:</b> <u>Clearing of very-low and low SEI.</u></p> <p><b>Option 1</b> and <b>Option 3</b></p> <table border="1" data-bbox="203 1109 824 1396"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Highly Probable (4)</td> <td>Probable (3)</td> </tr> <tr> <td><b>Duration</b></td> <td>Short term (2)</td> <td>Temporary (1)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site and Surrounds (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>32 (Medium)</b></td> <td><b>12 (Low)</b></td> </tr> </tbody> </table>	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Highly Probable (4)	Probable (3)	<b>Duration</b>	Short term (2)	Temporary (1)	<b>Extent</b>	Site and Surrounds (2)	Site (1)	<b>Magnitude</b>	Low (4)	Minor (2)	<b>Significance</b>	<b>32 (Medium)</b>	<b>12 (Low)</b>	<ul style="list-style-type: none"> <li>Ensure that maintenance work does not take place haphazardly, but according to a fixed plan.</li> <li>Maintenance workers may not trample natural vegetation and work should be restricted to previously disturbed footprint. In addition, mitigation measures as set out for the construction phase should be adhered to.</li> </ul>	<p>Medium</p>			
Description	Without Mitigation	With Mitigation																					
<b>Probability</b>	Highly Probable (4)	Probable (3)																					
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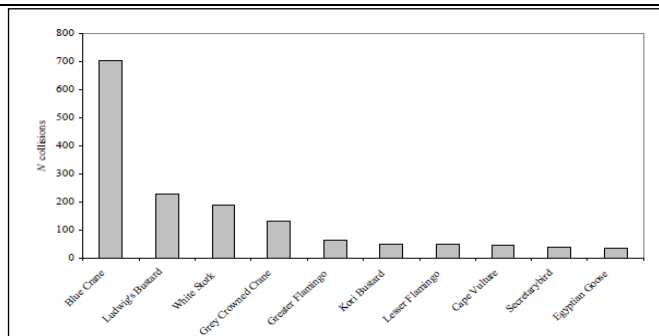
POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Option 2</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>		
<b>Probability</b>	Probable (3)	Possible (2)		
<b>Duration</b>	Short term (2)	Temporary (1)		
<b>Extent</b>	Site and Surrounds (2)	Site (1)		
<b>Magnitude</b>	Low (4)	Minor (2)		
<b>Significance</b>	<b>24 (Low)</b>	<b>8 (Low)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		
<b>Nature of Impact:</b> <u>Removal / Destruction of protected plants and plants of conservation concern.</u>			<ul style="list-style-type: none"> <li>Prevent trampling and edge effects beyond the approved development footprint.</li> <li>The relocated species should be monitored for at least three years post relocation. If die back is noted, a specialist should be consulted, and corrective action taken as soon as possible.</li> </ul>	Low
<b>Option 1 and Option 3</b>				
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>		
<b>Probability</b>	Probable (3)	Improbable (2)		
<b>Duration</b>	Short term (2)	Temporary (1)		
<b>Extent</b>	Local (2)	Site (1)		
<b>Magnitude</b>	Moderate (6)	Low (4)		
<b>Significance</b>	<b>30 (Low)</b>	<b>12 (Low)</b>		
<b>Status (positive or negative)</b>	Negative	Negative		

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
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<b>Significance</b>	<b>24 (Low)</b>	<b>12 (Low)</b>																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> <u>Potential increase in alien and invasive vegetation.</u></p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>30 (Low)</b></td> <td><b>10 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	Low (4)	Minor (2)	<b>Significance</b>	<b>30 (Low)</b>	<b>10 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>No alien and invasive plant species as listed on 18 September 2020 in the list of Alien Invasive Species published in terms of the National Environmental Management: Biodiversity Act (Act 10 of 2004) (Government Gazette No 43726 of 2020) may be planted within the development.</li> <li>Only use indigenous species for rehabilitation or landscaping.</li> <li>Remove alien invasive species from the disturbance footprint as soon as they become apparent.</li> </ul>	Low
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Probable (3)	Improbable (2)																							
<b>Duration</b>	Long term (4)	Short term (2)																							
<b>Extent</b>	Local (2)	Site (1)																							
<b>Magnitude</b>	Low (4)	Minor (2)																							
<b>Significance</b>	<b>30 (Low)</b>	<b>10 (Low)</b>																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> <u>Bush densification.</u></p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Local (2)	Site (1)	<ul style="list-style-type: none"> <li>Monitor the establishment of dense stands of encroacher species and remove or thin as soon as detected.</li> </ul>	Low									
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Probable (3)	Improbable (2)																							
<b>Duration</b>	Long term (4)	Short term (2)																							
<b>Extent</b>	Local (2)	Site (1)																							

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																																										
<b>Magnitude</b>	Low (4)	Minor (2)																																												
<b>Significance</b>	<b>30 (Low)</b>	<b>10 (Low)</b>																																												
<b>Status (positive or negative)</b>	Negative	Negative																																												
<p><b>Nature of the Impact:</b> Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste.</p> <p>Option 1 and Option 3</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Long term (4)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>30 (Low)</b></td> <td><b>18 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table> <p>Option 2</p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Probable (3)</td> <td>Improbable (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Long term (4)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>36 (Medium)</b></td> <td><b>18 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Long term (4)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	Low (4)	Low (4)	<b>Significance</b>	<b>30 (Low)</b>	<b>18 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	Description	Without Mitigation	With Mitigation	<b>Probability</b>	Probable (3)	Improbable (2)	<b>Duration</b>	Long term (4)	Long term (4)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	Moderate (6)	Low (4)	<b>Significance</b>	<b>36 (Medium)</b>	<b>18 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>• During Operation and Maintenance Activities:</li> <li>• Discontinue use of all faulty machinery / equipment on site until properly repaired.</li> <li>• Due to proximity of petrol stations, hydrocarbon storage on site should be limited to daily needs only.</li> <li>• Ensure proper stormwater management throughout.</li> <li>• Facilities will be provided for storage of all hazardous substances and waste to prevent the exposure of these substances to the environment. These will be erected on site before any substances are brought to site. The aim is to PREVENT exposure of fauna to any potential toxin.</li> <li>• All equipment / machinery will be serviced and maintained within operating specifications to prevent the risks of leaks.</li> <li>• All waste (domestic, hydrocarbon, hazardous) must be managed in line with the prescribed waste management plan. Refuse bins with properly secured lids will be placed on site to collect waste for separation, recycling and disposal.</li> <li>• Cement bags will be stored under a tarpaulin and on an impervious sheet. Cement mixing will take place within a designated flat area only.</li> <li>• All hydrocarbons and cement spills on bare ground will be cleared immediately.</li> <li>• Inspect and clear all litter and waste from the site and surrounds.</li> </ul>	Low
Description	Without Mitigation	With Mitigation																																												
<b>Probability</b>	Probable (3)	Improbable (2)																																												
<b>Duration</b>	Long term (4)	Long term (4)																																												
<b>Extent</b>	Local (2)	Site (1)																																												
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<b>Significance</b>	<b>36 (Medium)</b>	<b>18 (Low)</b>																																												
<b>Status (positive or negative)</b>	Negative	Negative																																												



POTENTIAL IMPACTS	PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED
<p><b>Nature of the Impact:</b> <u>Mortality of SCC and non-SCC priority species due to collision with the 88kV LILO powerline conductors/earthwires.</u></p> <p>Collisions are the biggest single threat posed by power lines to birds in southern Africa. Most heavily impacted upon are bustards, storks, cranes and various species of waterbirds. These species are mostly heavy-bodied birds with limited maneuverability, which makes it difficult for them to take the necessary evasive action to avoid colliding with power lines. Unfortunately, many of the collision sensitive species are considered threatened in southern Africa. Quantifying this impact in terms of the likely number of birds that will be impacted, is very difficult because a number of variables play a role in determining the risk, for example weather, rainfall, wind, age, flocking behaviour, power line height, light conditions, topography, population density and so forth. However, from incidental record keeping by the Endangered Wildlife Trust: Wildlife &amp; Energy Programme it is possible to give a measure of what species are likely to be impacted upon (see the figure below). This only gives a measure of the general susceptibility of the species to power line collisions, and not an absolute measurement for any specific line. Relevant to this LILO power line development, collisions may occur, but are likely to be infrequent given the short length of power line (i.e. 0.35km), the location of the loop-in and loop-out power lines directly adjacent to each other and the power lines proximity to the existing power high voltage power lines within the PAOI thereby reducing the risk of collisions to birds. The reasons for that are two-fold, namely it creates a more visible obstacle to birds and the resident birds, particularly breeding adults, which are accustomed to an obstacle in that geographic location and have learnt to avoid it.</p>	<ul style="list-style-type: none"> <li>• Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the Dihatshwane Substation and 88kV LILO power lines to the Eskom-Endangered Wildlife Trust Strategic Partnership.</li> <li>• Insulating material (if applied) to be maintained during the operational life span of the Dihatshwane Substation and 88kV LILO powerlines.</li> </ul>	<p>Low</p>



**Figure 25:** The top ten collision prone bird species in South Africa, in terms of reported incidents contained in the Eskom/EWT Strategic Partnership central incident register 1996 – 2007

**Option 1 and Option 3**

Description	Without Mitigation	With Mitigation
<b>Probability</b>	Possible (2)	Highly Unlikely (1)
<b>Duration</b>	Long term (4)	Medium term (3)
<b>Extent</b>	Local (2)	Local (2)
<b>Magnitude</b>	Moderate (6)	Low (4)
<b>Significance</b>	<b>24 (Low)</b>	<b>9 (Low)</b>
<b>Status (positive or negative)</b>	Negative	Negative

**Option 2**

Description	Without Mitigation	With Mitigation
<b>Probability</b>	Possible (2)	Highly Unlikely (1)
<b>Duration</b>	Long term (4)	Medium term (3)
<b>Extent</b>	Local (2)	Local (2)
<b>Magnitude</b>	Moderate (5)	Low (4)

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																		
<b>Significance</b>	<b>22 (Low)</b>	<b>9 (Low)</b>																				
<b>Status (positive or negative)</b>	Negative	Negative																				
<p><b>Nature of the Impact:</b> Mortality of SCC and non-SCC priority species as a result of electrocution on the 88kV LILO powerline infrastructure.</p> <p>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. Electrocution risk is strongly influenced by the power line voltage and design of the tower/pole structure and mainly affects larger, perching species that are capable of spanning the spaces between energized components. This is particularly likely when more than one bird attempts to sit on the same pole, a behaviour that is typical of gregarious vulture species when perching or roosting. If the proposed 88kV LILO power lines are constructed using a 132kV steel monopole specification, the clearance distances between the live components and/or live and earthed components of the 132kV tower structure should be sufficient to reduce the risk of electrocutions for most raptor species. However, this is not the case for the vulture species recorded in the PAOI. The best possible mitigation is the construction of the power line using an Eskom approved bird friendly pole/tower design (DT 7641/7649) accordance with the Distribution Technical Bulletin relating to bird friendly structures. Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.</p> <p><b>Option 1 and Option 3</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Highly Probable (4)</td> <td>Highly Unlikely (1)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Regional (3)</td> <td>Local (2)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>52 (Medium)</b></td> <td><b>6 (Low)</b></td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Highly Probable (4)	Highly Unlikely (1)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Regional (3)	Local (2)	<b>Magnitude</b>	Moderate (6)	Minor (2)	<b>Significance</b>	<b>52 (Medium)</b>	<b>6 (Low)</b>	<ul style="list-style-type: none"> <li>The 88kV powerline must be constructed using a bird friendly structure.</li> <li>Additional mitigation in the form of insulating sleeves on jumpers present on strain poles and terminal poles is also required, alternatively all jumpers must be suspended below the crossarms.</li> </ul>	Low
Description	Without Mitigation	With Mitigation																				
<b>Probability</b>	Highly Probable (4)	Highly Unlikely (1)																				
<b>Duration</b>	Long term (4)	Short term (2)																				
<b>Extent</b>	Regional (3)	Local (2)																				
<b>Magnitude</b>	Moderate (6)	Minor (2)																				
<b>Significance</b>	<b>52 (Medium)</b>	<b>6 (Low)</b>																				

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED												
<b>Status (positive or negative)</b>	Negative	Negative														
<b>Option 2</b>																
<b>Description</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>														
<b>Probability</b>	Highly Probable (4)	Highly Unlikely (1)														
<b>Duration</b>	Long term (4)	Short term (2)														
<b>Extent</b>	Regional (3)	Local (2)														
<b>Magnitude</b>	Low (4)	Minor (2)														
<b>Significance</b>	<b>44 (Medium)</b>	<b>6 (Low)</b>														
<b>Status (positive or negative)</b>	Negative	Negative														
<p><b>Nature of the Impact:</b> Mortality of SCC and non-SCC priority species as a result of electrocution within the Dihatshwane Substation.</p> <p>Electrocutions within the proposed Dihatshwane Substation are possible but should not affect the more sensitive SCC as these species are unlikely to use the infrastructure within the substation yards for perching or roosting. Since it is difficult to predict with any certainty where birds are likely to nest within the substation yards, coupled with the costs associated with insulating the entire substation, electrocutions will need to be mitigated using site-specific recommendations if and when they occur.</p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Possible (2)</td> <td>Highly Unlikely (1)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Local (2)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Possible (2)	Highly Unlikely (1)	<b>Duration</b>	Long term (4)	Short term (2)	<b>Extent</b>	Local (2)	Local (2)	<ul style="list-style-type: none"> <li>Eskom line and servitude managers are requested to report all bird electrocutions encountered during routine inspections and line patrols of the Dihatshwane Substation and 88kV LILO power lines to the Eskom-Endangered Wildlife Trust Strategic Partnership.</li> <li>Insulating material (if applied) to be maintained during the operational life span of the Dihatshwane Substation and 88kV LILO powerlines.</li> </ul>	Low
Description	Without Mitigation	With Mitigation														
<b>Probability</b>	Possible (2)	Highly Unlikely (1)														
<b>Duration</b>	Long term (4)	Short term (2)														
<b>Extent</b>	Local (2)	Local (2)														

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<b>Magnitude</b>	Low (4)	Minor (2)																							
<b>Significance</b>	20 (Low)	6 (Low)																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> Hazardous substance spillages.</p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Highly Probable (3)</td> <td>Probable (3)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Medium term (3)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>High (8)</td> <td>Moderate (6)</td> </tr> <tr> <td><b>Significance</b></td> <td>42 (Medium)</td> <td>30 (Low)</td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Highly Probable (3)	Probable (3)	<b>Duration</b>	Long term (4)	Medium term (3)	<b>Extent</b>	Local (2)	Site (1)	<b>Magnitude</b>	High (8)	Moderate (6)	<b>Significance</b>	42 (Medium)	30 (Low)	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>• Continuous monitoring must be undertaken.</li> <li>• Maintenance must be done regularly.</li> <li>• Spills must be reported and contained immediately.</li> <li>• Rehabilitation must be undertaken where required.</li> <li>• Spill trays and drip trays must always be available on site.</li> <li>• Bunding must be in place as well.</li> </ul>	Medium
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Highly Probable (3)	Probable (3)																							
<b>Duration</b>	Long term (4)	Medium term (3)																							
<b>Extent</b>	Local (2)	Site (1)																							
<b>Magnitude</b>	High (8)	Moderate (6)																							
<b>Significance</b>	42 (Medium)	30 (Low)																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of the Impact:</b> Loss and disturbance of heritage sites due to the development.</p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Very improbable (1)</td> <td>Very improbable (1)</td> </tr> <tr> <td><b>Duration</b></td> <td>Permanent (5)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Minor (2)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td>8 (Low)</td> <td>8 (Low)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Very improbable (1)	Very improbable (1)	<b>Duration</b>	Permanent (5)	Permanent (5)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Minor (2)	Minor (2)	<b>Significance</b>	8 (Low)	8 (Low)	<ul style="list-style-type: none"> <li>• Should graves, fossils or any archaeological artefacts be identified during construction, work on the area where the artefacts were found, must cease immediately and it should immediately be reported to a heritage practitioner or local museum so that an investigation and evaluation of the finds can be made.</li> </ul>	Low			
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Very improbable (1)	Very improbable (1)																							
<b>Duration</b>	Permanent (5)	Permanent (5)																							
<b>Extent</b>	Site (1)	Site (1)																							
<b>Magnitude</b>	Minor (2)	Minor (2)																							
<b>Significance</b>	8 (Low)	8 (Low)																							

POTENTIAL IMPACTS			PROPOSED MITIGATION	RISK OF THE IMPACT MITIGATION NOT BEING IMPLEMENTED																					
<i>Status (positive or negative)</i>	Negative	Negative																							
<p><b>Nature of the Impact:</b> <u>Loss and disturbance to palaeontology due to the development.</u></p> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Possible (2)</td> <td>Possible (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Short term (2)</td> <td>Short term (2)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Minor (2)</td> <td>Minor (2)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>10 (Low)</b></td> <td><b>10 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Possible (2)	Possible (2)	<b>Duration</b>	Short term (2)	Short term (2)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Minor (2)	Minor (2)	<b>Significance</b>	<b>10 (Low)</b>	<b>10 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>If any palaeontological material is exposed during maintenance, SAHRA must be notified. All maintenance activities must be stopped, a 30m no-go barrier constructed and a palaeontologist should be called in to determine proper mitigation measures.</li> <li>Protocol for finds must be followed.</li> <li>It is further suggested that a Section 37(2) agreement of the Occupational, Health and Safety Act 85 of 1993 is signed with the relevant maintenance contractors to protect the environment (fossils) and adjacent areas as well as for safety and security reasons.</li> </ul>	Low
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Possible (2)	Possible (2)																							
<b>Duration</b>	Short term (2)	Short term (2)																							
<b>Extent</b>	Site (1)	Site (1)																							
<b>Magnitude</b>	Minor (2)	Minor (2)																							
<b>Significance</b>	<b>10 (Low)</b>	<b>10 (Low)</b>																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of Impact:</b> <u>Dust Generation</u></p> <p>Construction machinery and heavy vehicles during maintenance which will likely make use of the existing gravel roads to transport equipment and material to the site are likely to generate dust which is likely to be perceptible by adjacent residents and the watercourse. Trucks may potentially distribute dust along internal access roads as well as into the watercourse given the nature of maintenance activities.</p> <p>Source of Impact:</p> <ul style="list-style-type: none"> <li>Construction vehicles.</li> <li>Machinery used for maintenance.</li> </ul> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Possible (2)</td> <td>Possible (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Temporary (1)</td> <td>Temporary (1)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Low (4)</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Possible (2)	Possible (2)	<b>Duration</b>	Temporary (1)	Temporary (1)	<b>Extent</b>	Local (2)	Local (2)	<b>Magnitude</b>	Low (4)	Low (4)	<ul style="list-style-type: none"> <li>Dust suppression and wet spraying should be implemented during operation and maintenance works.</li> <li>Limit maintenance hours to daytime and weekdays.</li> <li>Speed limits should be enforced to ensure that the generation of dust by construction vehicles during maintenance and for operational aspects are limited.</li> </ul>	Low						
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Possible (2)	Possible (2)																							
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<b>Significance</b>	<b>14 (Low)</b>	<b>14 (Low)</b>																							
<b>Status (positive or negative)</b>	Negative	Negative																							
<p><b>Nature of Impact:</b> <u>Noise</u>                      Source of Impact:</p> <ul style="list-style-type: none"> <li>Construction vehicles during maintenance.</li> <li>Equipment and machinery during maintenance.</li> </ul> <p><b>Both Options</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Mitigation</th> <th>With Mitigation</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Possible (2)</td> <td>Possible (2)</td> </tr> <tr> <td><b>Duration</b></td> <td>Short term (2)</td> <td>Temporary (1)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Low (4)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>16 (Low)</b></td> <td><b>14 (Low)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Mitigation	With Mitigation	<b>Probability</b>	Possible (2)	Possible (2)	<b>Duration</b>	Short term (2)	Temporary (1)	<b>Extent</b>	Local (2)	Local (2)	<b>Magnitude</b>	Low (4)	Low (4)	<b>Significance</b>	<b>16 (Low)</b>	<b>14 (Low)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>Inform residents of planned maintenance works.</li> <li>Institute noise control measures throughout maintenance periods.</li> <li>Maintenance activities must abide by the national noise laws and the municipal noise by-laws with regard to the abatement of noise caused by mechanical equipment.</li> <li>Speed limits must be adhered to.</li> </ul>	Low
Description	Without Mitigation	With Mitigation																							
<b>Probability</b>	Possible (2)	Possible (2)																							
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<p><b>Nature of Impact:</b> <u>Visual</u></p> <p><b>Option 1 and Option 3</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Enhancement</th> <th>With Enhancement</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Definite (5)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Long term (4)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Low (4)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>60 (Medium)</b></td> <td><b>50 (Medium)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Negative</td> <td>Negative</td> </tr> </tbody> </table>			Description	Without Enhancement	With Enhancement	<b>Probability</b>	Definite (5)	Definite (5)	<b>Duration</b>	Long term (4)	Long term (4)	<b>Extent</b>	Local (2)	Local (2)	<b>Magnitude</b>	Moderate (6)	Low (4)	<b>Significance</b>	<b>60 (Medium)</b>	<b>50 (Medium)</b>	<b>Status (positive or negative)</b>	Negative	Negative	<ul style="list-style-type: none"> <li>Regular maintenance</li> </ul>	High
Description	Without Enhancement	With Enhancement																							
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<p><b>Nature of impact:</b> Socioeconomic                      Source of Impact:</p> <ul style="list-style-type: none"> <li>Overall upliftment of the area.</li> </ul> <p><b>Option 1 and Option 3</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Enhancement</th> <th>With Enhancement</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Definite (5)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Local (2)</td> <td>Local (2)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>High (8)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>60 (Medium)</b></td> <td><b>75 (High)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Positive</td> <td>Positive</td> </tr> </tbody> </table> <p><b>Option 2</b></p> <table border="1"> <thead> <tr> <th>Description</th> <th>Without Enhancement</th> <th>With Enhancement</th> </tr> </thead> <tbody> <tr> <td><b>Probability</b></td> <td>Definite (5)</td> <td>Definite (5)</td> </tr> <tr> <td><b>Duration</b></td> <td>Long term (4)</td> <td>Permanent (5)</td> </tr> <tr> <td><b>Extent</b></td> <td>Site (1)</td> <td>Site (1)</td> </tr> <tr> <td><b>Magnitude</b></td> <td>Moderate (6)</td> <td>Moderate (6)</td> </tr> <tr> <td><b>Significance</b></td> <td><b>55 (Medium)</b></td> <td><b>60 (Medium)</b></td> </tr> <tr> <td><b>Status (positive or negative)</b></td> <td>Positive</td> <td>Positive</td> </tr> </tbody> </table>			Description	Without Enhancement	With Enhancement	<b>Probability</b>	Definite (5)	Definite (5)	<b>Duration</b>	Long term (4)	Permanent (5)	<b>Extent</b>	Local (2)	Local (2)	<b>Magnitude</b>	Moderate (6)	High (8)	<b>Significance</b>	<b>60 (Medium)</b>	<b>75 (High)</b>	<b>Status (positive or negative)</b>	Positive	Positive	Description	Without Enhancement	With Enhancement	<b>Probability</b>	Definite (5)	Definite (5)	<b>Duration</b>	Long term (4)	Permanent (5)	<b>Extent</b>	Site (1)	Site (1)	<b>Magnitude</b>	Moderate (6)	Moderate (6)	<b>Significance</b>	<b>55 (Medium)</b>	<b>60 (Medium)</b>	<b>Status (positive or negative)</b>	Positive	Positive	<ul style="list-style-type: none"> <li>Regular maintenance</li> </ul>	Medium (Positive)
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#### 7.4 No-Go Alternative

No go Alternative (compulsory). This is the alternative of not developing the substation. This alternative will result in limited construction impacts already occurring in the study area. However, should the infrastructure not be developed as proposed, areas within and surrounding Dihatshwane and Rooigrond will remain without electricity and the existing grid will remain under pressure. This is an undesirable alternative for the project as it will pose negative impacts from the social and economic perspective and is not considered desirable. The negative impacts of the no go alternative are considered to outweigh the positive impacts of this alternative. The no go alternative is therefore not preferred.

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
Impact to possible wetland – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Clearing of very-low and low SEI – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Removal / Destruction of protected plants and plants of conservation concern – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Potential increase in alien and invasive vegetation – No-go would mean study site status quo is maintained.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Bush densification – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk

Displacement of SCC and non-SCC priority species as a result of habitat loss & transformation – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Displacement of SCC and non-SCC priority species as a result of disturbance – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Loss and disturbance of heritage sites due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Loss and disturbance to palaeontology due to the development – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Visual – No-go would mean study site status quo is maintained.	P – Low	There are no mitigation measures	P – Low	Low risk
Dust generation – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Crime, safety and security: during construction – No-go would imply that the area remains as is.	P – High	There are no mitigation measures	P – High	Low risk
Noise – No-go would imply no construction noise.	P – High	There are no mitigation measures	P – High	Low risk
Traffic and accessibility – No-go would imply no impact to traffic and accessibility.	P – Medium	There are no mitigation measures	P – Medium	Low risk
Pollution due to inappropriate handling of generated waste on site – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk
Hazardous substance spillages anticipated during the operational period – No-go would mean study site status quo is maintained.	P – High	There are no mitigation measures	P – High	Low risk

Socioeconomic impacts anticipated during the construction period – No-go would mean no local job opportunities for general and skilled labourers as well as no opportunities for local retailers.	N – High	The development of the substation will provide job opportunities for locals and for local retailers.	N – High	High risk
Socioeconomic impacts anticipated during the operational period – No-go would mean that overall community upliftment will not occur.	N – High	By providing electricity to the local communities in the area, overall upliftment in these areas will occur as a basic need is being met.	N – High	High risk
Electricity supply anticipated during the operational period – No-go would mean that electricity will not be supplied to the local communities in the area.	N – High	The substation will connect to the existing grid and will be able to take the pressure off from the existing network. It will also be supplying electricity to areas that do not have this basic service.	N – High	High risk

## 7.5 Cumulative impacts

Cumulative impacts can result from actions which may not be significant on their own but which are significant when added to the impact of other similar actions. The anticipated cumulative impacts of this development include the following:

- **Spread of alien vegetation**

Disturbance during construction will result in more alien plant species occurring on site as such plant species proliferate in disturbed areas.

- **Increased socio-economic upliftment as a result of the proposed development**

Constructing the proposed substation and LILO will result in direct jobs being created during the construction phase. During the operational phase, the supply of electricity will be allowed to the local communities in the area and reduce the pressure on the existing grid. This will in turn assist Eskom in achieving their mandate of providing affordable electricity.

- **Destruction or degradation of protected plants and plants of conservation concern**

Loss of functionality of protected plants and plants of conservation concern, as well as erosion due to edge effects can occur as a result of the proposed development. If mitigation measures are adequately implemented, no cumulative impacts are expected.

- **Direct impact on species richness and loss of habitat (fauna)**

Construction and operational activities may result in cumulative impact to the traditional migration routes of mammals, reptiles and especially frogs on the study site and on adjacent properties. Altered population dynamics of natural indigenous species could cause significant impact on overall faunal community structure and alter natural food-chains. It is imperative that effective protective measures should be put into place to protect wetlands and their buffer areas. The increased roads and traffic will definitely cause permanent disruption of migration routes unless mitigation takes place.

Responsible environmental management will be required during the entire project life cycle. These management measures should be guided by the Generic Environmental Management Programme (EMPr) attached as **Appendix F**.

## 8. CONCLUSIONS AND RECOMMENDATIONS

### 8.1 Summaries of Specialist findings

#### 8.1.1 Aquatic Biodiversity Assessment

Based on available desktop techniques and in-field recordings, no wetlands or watercourses were recorded at either substation. However, Option 2 could potentially exhibit some wetland features during high rainfall events due to the high clay content of the soil. Due to this **Option 1 and 3 is thus the preferred substation**. Additional consideration made to determine the best suitable substation include:

- Option 1 and 3 is located in an area where development is fast expanding and likely to become developed eventually.
- The area near Option 2 may have some temporary wetness during the rainy season (classification as a wetland to be confirmed through a hydrogeological assessment).
- Option 1 and 3 has adequate access roads while Option 2 may require additional access roads.
- A wetland is shown on the hydrological layers on and adjacent Option 2 although wetland indicators could not be found during the site assessment).
- Option 1 and 3 are equally the preferred options since Substation Option 2 will only be able to supply the Rooigrond community as a result of the location.

#### 8.1.2 Terrestrial Vegetation and Plant Species Habitat Assessment

The vegetation at all the substation Options comprised Klerksdorp Thornveld, however, the vegetation at Option 2 was in a degraded state due to heavy grazing, harvesting of firewood and dumping, while the powerline corridor of Option 3 included secondary and modified vegetation. As per the Site Ecological Importance (SEI) analysis, Option 2 scores a lower SEI due to its proximity to existing development and its degraded state. From a vegetation perspective, **Option 2 is therefore the preferred site for the substation, although its associated LILO corridor is longer than that of Option 1 & 3. However, if the clay depression on Option 2 has wetland properties or for any other reason Option 2 is undevelopable, then this report does not object to the development on Option 3**, provided that suitable mitigation measures are implemented. If mitigation measures are implemented throughout the project, the impact that the development will have in the long term is minimal.

#### 8.1.3 Terrestrial Fauna and Biodiversity Assessment

The site is composed of bushveld and rocky bushveld of varying degrees of shrub / tree density. Modified (cleared grasslands) and disturbed areas (excavations) were evident around Option 1 and Option 3. The anthropogenic activity in and around site (pedestrians, herders with stock animals and informal settlers) and the possible activity of domestic animals (feral cats), means that many animals could be disturbed or hunted or chased off site. No highly significant impacts were identified in terms of this study, and impacts can all be adequately mitigated through vigilant activity, good planning and good housekeeping practices during construction phase. Operational phase is assumed to be limited to maintenance and not expected to impact further on the area in terms of terrestrial fauna as long as the mitigations stipulated in this report are adhered to. In terms of this assessment there is no reason not to authorise the activity in terms of terrestrial fauna biodiversity and animal species and either of the three options are considered adequate for development. However, despite the proximity to the PA, **Option 1 and Option 3 are preferred** as they are within a disturbed plot already affected by general activity, adjacent to an impeding structure (the existing PA's wall) in terms of terrestrial fauna mobility and have more evidence of extensive historical disturbance (cleared bushveld and excavations). They also do not extend into the open space that could contribute to an expansive ecological corridor associated with the Molopo River.

#### 8.1.4 Avifaunal Impact Assessment

In conclusion, the habitat within which the project area is located is considered to have a LOW sensitivity. In recent years, anthropogenic impacts, mostly in the form of settlement, agricultural and pastoral activities have largely transformed the landscape resulting in a negative impact on avifaunal diversity and abundance with the project area. The construction of the Dihatshwane Substation and 88kV LILO power lines will result in impacts of MEDIUM-LOW significance to birds occurring in the vicinity of the new infrastructure, which can be reduced further through the application of mitigation measures. It is anticipated that the Dihatshwane Substation and 88kV LILO power lines can be constructed with acceptable levels of impact on the resident avifauna, subject to recommendations in Appendix E4. In accordance with the outcomes of the impact assessment the proposed Dihatshwane Substation locations and 88kV LILO power line alignments are not deemed to present unmitigable negative environmental issues or impacts. It is this specialist's opinion that the construction of the Dihatshwane Substation and 88kV LILO power lines will result in acceptable levels of impact on the resident avifauna subject to the aforementioned mitigation and management measures.

#### 8.1.5 Heritage Impact Assessment

From a heritage perspective, there are no preferred options; both will result in similar impacts. From a heritage point of view, it is recommended that the proposed project be allowed to continue on acceptance of the mitigation measures and conditions presented in the report.

#### 8.1.6 Palaeontological Impact Assessment

Both the proposed sites lie on the Tertiary-Quaternary Calcrete that might have trapped fossils although none has been reported from this area. Nonetheless, a Fossil Chance Find Protocol should be added to the EMP. Based on this information it is recommended that no further palaeontological impact assessment is required unless fossils are found by the contractor, environmental officer or other designated responsible person once excavations or drilling for foundations have commenced. Since the impact will be low, as far as the palaeontology is concerned, the project should be authorised. There is no preferred option for the Dihatshwane Substation as far as the palaeontological heritage. Both are acceptable.

#### 8.1.7 Environmental Sensitivities Mapping

From the conclusions of the detailed studies undertaken, sensitive areas within the development were identified and flagged for consideration and avoidance (where possible) by the Preferred Layout Plan. The following highly sensitive areas/environmental features as shown in **Figure 26** have been identified on the site

- **Aquatic and Wetland:** Area around Substation Option 2 could potentially exhibit some wetland features during high rainfall events due to the high clay content of the soil.
- **Terrestrial Biodiversity:** Vegetation at Option 2 was in a degraded state due to heavy grazing, harvesting of firewood and dumping. As per the Site Ecological Importance (SEI) analysis, Option 2 scores a lower SEI due to its proximity to existing development and its degraded state. The *Boophane distichia* species was recorded close to the Option 1 and Option 3 sites and along the existing distribution line. These species are unlikely to be impacted on (Figure 26) but must be relocated to outside of the development footprint if it will be impacted on. A provincially protected succulent was recorded west of the Option 2 LILO corridor. If this species is to be impacted on, or found elsewhere in the proposed footprint, it should be relocated with the permission of the local authority.

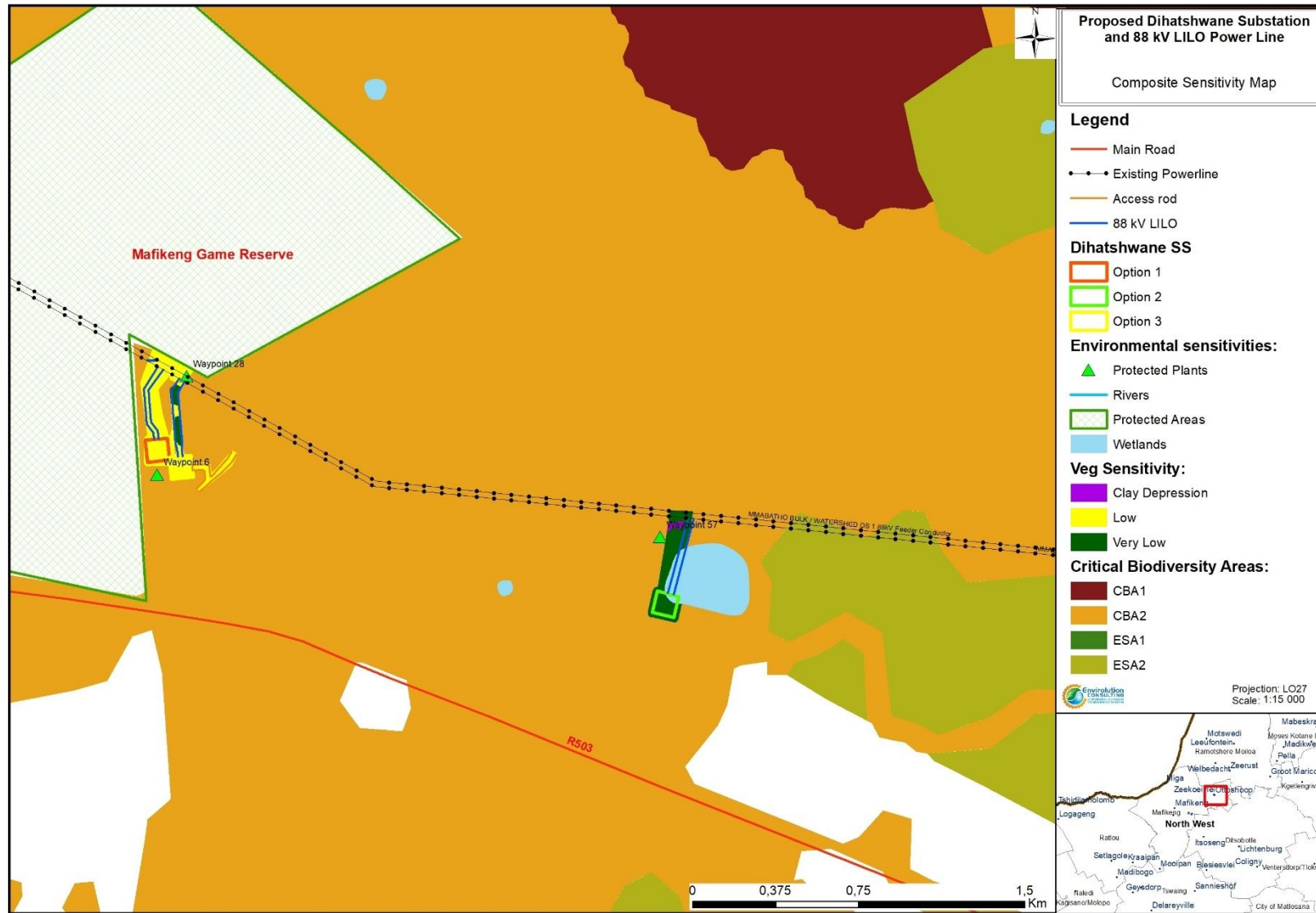


Figure 26: Composite Environmental Sensitivity Map (refer to Appendix A for the A3 Maps)



### 8.2 Impact Summary of the alternatives

The **Table 10** below gives an overall summary of the preferred alternatives for each component of the development as a result of the comparative assessment undertaken in Table 8 and 9. According to the above table, overall a collective significance of impacts would be less for both Option 1 and 3.

**Table 10:** Construction Phase Impacts

Construction Phase						
Nature of Impact	Substation Option 1		Substation Option 2		Substation Option 3	
	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation	Without Mitigation	With Mitigation
Impact to possible wetland	N/A	N/A	55 (Medium)	40 (Medium)	N/A	N/A
Clearing of very-low and low SEI	55 (Medium)	40 (Medium)	55 (Medium)	40 (Medium)	55 (Medium)	40 (Medium)
Removal/ Destruction of protected plants and plants of conservation concern	33 (Medium)	14 (Low)	42 (Medium)	20 (Low)	33 (Medium)	14 (Low)
Potential increase in alien and invasive vegetation	70 (High)	21 (Low)	70 (High)	21 (Low)	70 (High)	21 (Low)
Bush densification	36 (Medium)	14 (Low)	33 (Medium)	14 (Low)	36 (Medium)	14 (Low)
Contamination of fauna environment through use and storage of hazardous substances,	52 (Medium)	14 (Low)	52 (Medium)	14 (Low)	52 (Medium)	14 (Low)

littering and dumping of waste						
Displacement of SCC and non-SCC priority species as a result of habitat loss & transformation	<b>44 (Medium)</b>	<b>18 (Low)</b>	<b>33 (Medium)</b>	<b>16 (Low)</b>	<b>44 (Medium)</b>	<b>18 (Low)</b>
Displacement of SCC and non-SCC priority species as a result of disturbance	<b>40 (Medium)</b>	<b>21 (Low)</b>	<b>30 (Low)</b>	<b>14 (Low)</b>	<b>40 (Medium)</b>	<b>21 (Low)</b>
Loss and disturbance of heritage sites due to the development	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>
Loss and disturbance to palaeontology due to the development	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>	<b>8 (Low)</b>
Visual impact	<b>60 (Medium)</b>	<b>36 (Medium)</b>	<b>65 (High)</b>	<b>36 (Medium)</b>	<b>60 (Medium)</b>	<b>36 (Medium)</b>
Dust Generation	<b>55 (Medium)</b>	<b>27 (Low)</b>	<b>55 (Medium)</b>	<b>40 (Medium)</b>	<b>55 (Medium)</b>	<b>27 (Low)</b>
Crime, safety and security	<b>40 (Medium)</b>	<b>21 (Low)</b>	<b>44 (Medium)</b>	<b>24 (Low)</b>	<b>40 (Medium)</b>	<b>21 (Low)</b>
Noise	<b>60 (Medium)</b>	<b>36 (Medium)</b>	<b>65 (High)</b>	<b>36 (Medium)</b>	<b>60 (Medium)</b>	<b>36 (Medium)</b>
Traffic and accessibility	<b>45 (Medium)</b>	<b>32 (Medium)</b>	<b>65 (High)</b>	<b>40 (Medium)</b>	<b>45 (Medium)</b>	<b>32 (Medium)</b>
Pollution due to inappropriate handling	<b>44 (Medium)</b>	<b>24 (Low)</b>	<b>52 (Medium)</b>	<b>30 (Low)</b>	<b>44 (Medium)</b>	<b>24 (Low)</b>

of generated waste on site						
<b>Operational Phase</b>						
<b>Nature of Impact</b>	<b>Substation Option 1</b>		<b>Substation Option 2</b>		<b>Substation Option 3</b>	
	<b>Without Mitigation</b>	<b>With Mitigation</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>	<b>Without Mitigation</b>	<b>With Mitigation</b>
Impact to possible wetland	N/A	N/A	21 (Low)	8 (Low)	N/A	N/A
Clearing of very-low and low SEI	32 (Medium)	12 (Low)	24 (Low)	8 (Low)	32 (Medium)	12 (Low)
Removal / Destruction of protected plants and plants of conservation concern	30 (Low)	12 (Low)	24 (Low)	12 (Low)	30 (Low)	12 (Low)
Potential increase in alien and invasive vegetation	30 (Low)	10 (Low)	30 (Low)	10 (Low)	30 (Low)	10 (Low)
Bush densification	30 (Low)	10 (Low)	30 (Low)	10 (Low)	30 (Low)	10 (Low)
Contamination of fauna environment through use and storage of hazardous substances, littering and dumping of waste	30 (Low)	18 (Low)	36 (Medium)	18 (Low)	30 (Low)	18 (Low)

Mortality of SCC and non-SCC priority species due to collision with the 88kV LILO powerline conductors/earthwires	24 (Low)	9 (Low)	22 (Low)	9 (Low)	24 (Low)	9 (Low)
Mortality of SCC and non-SCC priority species as a result of electrocution on the 88kV LILO powerline infrastructure	52 (Medium)	6 (Low)	44 (Medium)	6 (Low)	52 (Medium)	6 (Low)
Mortality of SCC and non-SCC priority species as a result of electrocution within the Dihatshwane Substation	20 (Low)	6 (Low)	20 (Low)	6 (Low)	20 (Low)	6 (Low)
Hazardous substance spillages	42 (Medium)	30 (Low)	42 (Medium)	30 (Low)	42 (Medium)	30 (Low)
Heritage impacts	8 (Low)	8 (Low)	8 (Low)	8 (Low)	8 (Low)	8 (Low)
Palaeontology impacts	10 (Low)	10 (Low)	10 (Low)	10 (Low)	10 (Low)	10 (Low)
Dust	14 (Low)	14 (Low)	14 (Low)	14 (Low)	14 (Low)	14 (Low)
Noise	16 (Low)	14 (Low)	16 (Low)	14 (Low)	16 (Low)	14 (Low)
Visual	60 (Medium)	50 (Medium)	70 (High)	60 (Medium)	60 (Medium)	50 (Medium)
<b>Positive Impacts</b>						

Nature of Impact	Substation Option 1		Substation Option 2		Substation Option 3	
	Without Enhancement	With Enhancement	Without Enhancement	With Enhancement	Without Enhancement	With Enhancement
Socio-economic Impacts: during construction	24 (Low)	40 (Medium)	24 (Low)	40 (Medium)	24 (Low)	40 (Medium)
Socio-economic Impacts: during operation	60 (Medium)	75 (High)	55 (Medium)	60 (Medium)	60 (Medium)	75 (High)
Electricity supply	60 (Medium)	75 (High)	55 (Medium)	60 (Medium)	60 (Medium)	75 (High)

### 8.3 Conclusion (Impact Statement)

One of the objectives of this study is to determine the preferred location of the Dihatshwane Substation within the proposed study area. The three substation locations with their associated LILO lines were assessed.

#### Comparative Assessment of Alternatives:

Based on available desktop techniques and in-field recordings, no wetlands or watercourses were recorded at either substation.

- **Aquatic:** Option 2 could potentially exhibit some wetland features during high rainfall events due to the high clay content of the soil. The area near Option 2 may have some temporary wetness during the rainy season (classification as a wetland to be confirmed through a hydro-pedological assessment). A wetland is shown on the hydrological layers on and adjacent Option 2 although wetland indicators could not be found during the site assessment). Due to this Option 1 and 3 location is thus the preferred substation.
- **Avifauna & Vegetation:** The location of substation Option 1 adjacent to the Mafikeng Game Reserve and its proximity to the pans in the north west of the PAOI, make this option the least preferred. Although Option 3 is located 120m from the Mafikeng Game Reserve property boundary, in bird terms this is still within the disturbance impact zone. However, its location adjacent to the existing water treatment facility and is therefore not Option 2 is subject to significant levels of disturbance and less likely to attract avian priority species and is therefore nominated as the preferred substation alternative. However, neither alternatives are fatally flawed and can be utilised with appropriate mitigation.

Option 2 is considered more disturbed so a slightly lower environmental impact and preferred by the Avifaunal studies otherwise the study states that neither alternatives are fatally flawed and can be utilised with appropriate mitigation. The Both sites have some vegetation of concern that requires removal and must be managed adequately.

- **Technically:** Additional technical consideration made to determine the best suitable substation include:
  - Option 1 and 3 are located in an area where development is fast expanding and likely to become developed eventually;
  - Option 1 and 3 has adequate access roads while Option 2 may require additional access roads.
  - Option 1 and 3 are equally the preferred options by the local municipality as these aligns with their current development plans approved for the area. Substation Option 2 will only be able to supply the Rooigrond community as a result of the location.
  - Substation Option 2 will require a longer length of LILO to connect to the existing grid. This may imply a slightly longer construction period. Option 1 and 3 allow for multiple areas to be connected to the electricity grid supply whereas Option 2 is limited and only feeds Rooigrond. All three options have very similar impacts.
  - The alternative 1 and 3 will be technically viable because of the Municipality development planned to take in the area. Eskom is planning with Municipality to accommodate the future lines whereas for alternative 2 there is already RDP houses

on the way for proper line routes which will have an impact on the safety of the community.

- The project will also take load from the existing network whereby downloading Mahikeng Main Substation and Rooigrond Substation and alternative 1 and 3 will make this simple to achieve as compared to option 2.
- **Socially:** Option 1 and 3 are ideal as they are not within close proximity to communities and the impacts will have a lower significance to the communities. However due to its close proximity to the Mafikeng Nature Reserve, Option 3 has been proposed. Option 2 will have some risk towards the communities such as visual, noise, dust as well as crime and safety.

**Preferred Option:** This assessment shows that either alternatives are fatally flawed and can be utilised with appropriate mitigation. However, technically Option 2 is the least preferred, the location of substation Option 1 adjacent to the Mafikeng Game Reserve makes this option the least preferred by the Reserve Management Board, whom requested that Eskom move this location away from their boundary. Option 3 (the new site) is located 120m from the Mafikeng Game Reserve property boundary and **Option 3** is therefore nominated as the **preferred substation alternative**.

The project will result in some unavoidable environmental impacts during construction but this is not a fatal flaw. The nature of the project has been planned in such a way that there are minimal negative environmental impacts. None of these adverse impacts are considered unacceptably significant and all can be managed to acceptable levels through the effective implementation of the recommended mitigation measures. In addition, the project will provide benefits to the local community in terms of service provision. The project has considered constraints, and is considered to meet the requirements of sustainable development. Environmental specifications for the management of potential impacts are detailed within the Generic Environmental Management Programme (EMPr) for the Dihatshwane substation and LILO Powerline development included within **Appendix F**.

#### 8.4 Recommendations

In accordance with the outcomes of the baseline conditions as presented in Section 6, in conjunction with the impact assessment detailed in Section 7 of this Report, the proposed Dihatshwane Substation locations and 88kV LILO power line alignments are **not deemed to present unmitigable negative environmental issues or impacts**. It is this specialist's opinion that the construction of the Dihatshwane Substation and 88kV LILO power lines will result in acceptable levels of impact on the resident avifauna subject to the aforementioned mitigation and management measures.

Envirolution Consulting (Pty) Ltd thus suggests the approval of the **Preferred Substation Option 3 and associated 88kV LILO power line alignments** be considered for approval subject to the following general recommendations:

1. The removal of protected plant species should be avoided where possible. Where required, necessary permits/ approvals must be in place and rehabilitation must be ensured.
2. The managing body of the Mafikeng Game Reserve must be consulted on the proposed project and any requirements of the Nature Reserves' EMPr regarding buffer zones must be complied with. All sites are within the 5km buffer of a Protected Area.
3. Should archaeological sites or graves be exposed during further construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made. The appropriate steps to take are indicated in the Generic EMPr.

4. A Fossil Chance Find Protocol should be in place.
5. Implementing the Generic EMPr to guide construction and operational activities to provide a framework for the on-going assessment of environmental performance.
6. Water Use License: The relevant authorisations and water use licenses must be obtained from the DWS prior to the commencement of construction activities if Substation Option 2 is considered and if it is regarded as having wetland conditions.
7. No development other than the authorized activities will be allowed within a wetland or buffer of the wetland measured from the edge of the wetland, or any other sensitive environmental area.
8. An independent ECO must be appointed/ designated to ensure that regular inspections are performed during the construction phase and to ensure the implementation of mitigation measures. Furthermore, an ECO must monitor compliance with all the conditions of the Generic EMPr and the environmental authorization once issued.
9. There is continued consultation with relevant stakeholders/landowner through an appointed community liaison officer during construction.
10. Reports on the status of construction and legal compliance are submitted to DFFE at stipulated intervals.
11. Clearance of the area should be as minimal as possible and construction activities be confined to areas where construction will take place (development footprint) to prevent negative impacts onto the surrounding environment.
12. Avoid, as far as reasonably possible, disturbing the wetlands. Similarly, restore wetlands that will remain intact if they have been affected by construction activity – where applicable.
13. Adequate measures must be put in place to prevent polluted runoff water from entering wetlands, soil and other sensitive environmental areas, thus preventing surface and groundwater pollution.
14. Servicing/maintenance/washing of vehicles must not be carried on the construction site and only emergency repairs can be done on site.
15. In the event of a major incident (e.g. fire causing damage to property and environment, major spill or leak of contaminants), the relevant authorities should be notified as per the notification of emergencies/ incidents, as per the requirements of Section 30(3) of NEMA.
16. Construction noise on site must not exceed 85 decibels (DB) as stipulated in the Occupation Health and Safety Act (Act No. 85 of 1993).
17. All relevant legislation and requirements of other government departments (National, Provincial), in particular of Section 28 (duty of care) of NEMA, must be complied with.
18. Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by DFFE.
19. Maximise the employment of local people and the procurement of local resources during the construction and maintenance phases to ensure maximum benefit to the provincial/local economy.
20. Implement the recommendations made in the specialist studies and Generic EMPr.
21. The Generic EMPr should form part of the contractor's tender documentation.
22. Period for which the Environmental Authorisation is Required: The Environmental Authorisation is required for a period of 10 years from the date of issue. Should a longer period be required, the applicant/ EAP will be required to provide a detailed motivation on what the period of validity should be



## 9. APPENDICES

The following appendixes are attached:

### **Appendix A: Site plan(s)**

- Appendix A1: Locality Maps
- Appendix A2: Sensitivity Maps
- Appendix A3 - Composite Sensitivity Maps

### **Appendix B: Site Photographs**

### **Appendix C: Facility Illustrations**

### **Appendix D: Public Participation Process**

- Appendix D1: Site Notices
- Appendix D2: Newspaper Advertisement
- Appendix D3: Written notifications
- Appendix D4: Authority Consultation
- Appendix D5: Comments on the Draft BA Report
- Appendix D6: Minutes of meetings
- Appendix D7: Comment & Response Report
- Appendix D8: I&APs Database

### **Appendix E: Specialist Studies**

- Appendix E1: Aquatic Biodiversity Assessment
- Appendix E2: Terrestrial Vegetation and Plant Species Habitat Assessment
- Appendix E3: Terrestrial Fauna and Biodiversity Assessment
- Appendix E4: Avifaunal Impact Assessment
- Appendix E5: Heritage Impact Assessment
- Appendix E6: Palaeontological Impact Assessment
- Appendix E7: Specialist Declarations

### **Appendix F: Generic Environmental Management Programme (EMPr)**

### **Appendix G: Other Information**

- Appendix G1 - Details of EAP (expertise) and Affirmation
- Appendix G2 – Network Planning Proposal
- Appendix G3 - Screening Report