

DRAFT

BASIC ASSESSMENT FOR THE PROPOSED  
DEVELOPMENT OF THE NEW 132KV,  
EXPANSION OF THE 400KV ESKOM MAJUBA  
SUBSTATION AND ASSOCIATED  
INFRASTRUCTURE, WITHIN THE ESKOM  
MAJUBA POWER STATION IN MPUMALANGA  
PROVINCE

NSOVO REF: F015-24

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PREPARED FOR  
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DOCUMENT CONTROL		
Draft Basic Assessment Report	REV000	09 June 2024






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DOCUMENT CONTROL

**PROJECT TITLE:**

**DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED DEVELOPMENT OF THE NEW 132KV SUBSTATION AND EXPANSION OF THE 400KV MAJUBA SUBSTATION AND ASSOCIATED INFRASTRUCTURE, WITHIN THE ESKOM MAJUBA POWER STATION, UNDER PIXLEY KA SEME LOCAL MUNICIPALITY IN MPUMALANGA PROVINCE.**

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Draft Basic Assessment Report	Nontokozo Gumede  _____ 05 June 2024 Candidate EAP EAPASA: Registration No. 2023/6484	Document Approval Munyadziwa Rikhotso  _____ EAPASA Registration No. 2019/ 1156
Document Approval and Quality Review		
	Document Approval Munyadziwa Rikhotso  _____ EAPASA Registration No. 2019/ 1156	Quality Review

## EXECUTIVE SUMMARY

Nsovo Environmental Consulting (hereafter referred to as Nsovo) has been appointed as the Environmental Assessment Practitioner (EAP) by Eskom Holdings SOC Ltd (hereafter referred to as Eskom) to undertake a Basic Assessment process for the proposed development of the new 132 kV substation, expansion of the existing 400 kV substation and associated infrastructure. The project is within the Majuba Power Station footprint, in the Pixley Ka Seme Local Municipalities, within the jurisdiction of Gert Sibande District Municipality, Mpumalanga Province.

In terms of the National Environmental Management Act, 1998 (Act 107 of 1998) (as amended) (NEMA) and the December 2014 EIA Regulations GN.982 and GN.983 as amended, the proposed development triggers activities that require Eskom to obtain an Environmental Authorisation (EA) through a Basic Assessment (BA) process from the National Department of Environment Forestry and Fisheries (DFFE) before commencement of the proposed development.

- This is an application for Environmental Authorisation for listed activities as contained in Government Notice Regulations (GN R), GN 983, and GNR 985.

The establishment of a new 132 kV substation and the expansion of the 400 kV yard, including the installation of 2 x 400/132 kV 500 MVA transformers at the Majuba substation, will ensure the availability of a total of 950 MW unfirm capacity and 475 MW firm capacity. The upgrades to the 400 kV equipment will be carried out under the refurbishment project at Majuba.

The Basic Assessment Report (BAR) has been compiled in line with the requirements of Appendix 1 of the EIA Regulations, and it contains the following information:

- The details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the report;
- The location of the proposed activities;
- A plan which locates the proposed activities to be undertaken;
- Description of the scope of the proposed project, including the listed activities and the associated structures and infrastructures;
- Description of Policy and Legislative content within which the development is located and an explanation of how the development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability of the proposed development;
- A full description of the process followed to reach the proposed preferred activities, site, and proposed location of the development footprint within the site;
- An undertaking under oath or affirmation by the EAP.

Consideration of alternatives is a key requirement for any EIA process and includes consideration of technical, structural, and locality. The report provides a detailed motivation for not considering alternatives other than the preferred and no-go alternatives.

This draft BAR includes specialist studies that were commissioned to respond and provide meaningful input in addressing the issues and concerns raised during the Scoping, and they include:

Specialist Study	Company	Name of Specialist
Heritage Impact Assessment	(AHTA) Archaeological and Heritage Services Africa (Pty) Ltd	Edward Matenga
Aquatic Impact Assessment	Ecology International	Byron Grant
Terrestrial Biodiversity Assessment	Mboneni Ecological Services (Pty) Ltd	Avhafarei Phamphe
Wetland Impact Assessment	Watermakers	Willem Lubbe
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane
Paleontology	Marion Bamford Consulting	Prof. Marion Bamford

Other themes that were assessed include the following:

- Civil Aviation; and
- Defence.

In line with the DFFE's recommendation during the pre-application meeting, the EAP duly undertook a sensitivity verification to confirm the screening tool's sensitivity ratings.

Positive and negative environmental impacts (ranging from habitat loss to operational effects) were identified and assessed for the proposed development.

From an ecological perspective, the development site within the Majuba Power Station area has limited natural vegetation, mostly replaced by invasive species. However, natural vegetation remains outside the power station, particularly in the Majuba Nature Reserve. No threatened plant species or protected trees were found in the study area, but a search and rescue plan for plant species of conservation concern is recommended. Fauna of conservation concern, especially reptiles and amphibians, are likely to be found within the Nature Reserve, necessitating phased earthworks and search and rescue operations to mitigate impacts.

The Palaeontological specialist indicated that based on the nature of the project, surface activities may impact the fossil heritage if preserved in the development footprint. The geological structures suggest that the rocks are the right age and type to contain fossils, but the fossils are very rare and sparsely and unpredictably distributed. Furthermore, the material to be excavated is soil, which does not preserve fossils. Since there is an extremely small chance that fossils may occur below ground in the shales of the Volksrust Formation and may be disturbed, a Fossil Chance Find Protocol has been added to this report. Taking account of the defined criteria, the potential impact on fossil heritage resources is very low.

According to the Terrestrial Biodiversity specialist, the Majuba Power Station's anthropogenic activities include ash disposal facilities, cooling towers, pollution control dams, and infrastructure such as roads and buildings. Within the power station site, limited natural vegetation remains, largely replaced by invasive plant species and weeds. However, natural vegetation persists outside the power station, particularly in the Majuba Nature Reserve. Field surveys found no threatened plant species or protected trees within the study area, but a search and rescue plan is recommended for any plant species of conservation concern discovered during construction, with suitable habitats available within the Nature Reserve for translocation.

Fauna of conservation concern, especially reptilian and amphibian species, are more likely to be found within the Nature Reserve. Mitigation measures include phased earthworks to allow fauna to move away from the development site and a search and rescue operation for slow-moving or burrowing species like moles, chameleons, snakes, and tortoises. The project activities will impact biodiversity conservation within the Nature Reserve, making it critical to limit habitat destruction and adhere to the approved footprint to maintain higher faunal and floral species diversity.

Based on a screening report, the proposed site's environmental sensitivity ranges from low (inside the power station) to high (within the nature reserve). Since the development is along the existing servitude, disturbances to natural ecosystems are expected to be minimal. Mitigation measures are essential within the Nature Reserve, and the impacts on flora and fauna can be mitigated satisfactorily, making the development ecologically acceptable. Post-construction rehabilitation should ensure no alien plant emergence or erosion.

No fatal flaws or highly significant impacts were identified that would necessitate substantial redesign or termination of the project. The main impacts have been discussed, and mitigation measures have been identified to mitigate the scale, intensity, and significance of the impacts with a high or medium rating.

The Generic Environmental Management Programme (EMPR) for substations has been adopted, and additional measures are included in Section C.

It is recommended that the proposed project be approved and all management and mitigation measures implemented to reduce its environmental impact, particularly on biodiversity, avifauna, visual, ecotourism, and ecology.

This draft BA Report is hereby submitted to Interested and Affected Parties (I&APs) and organs of the State for a 30-day review and comment period. Comments received on the draft Report will be included in the Comments and Responses Report (CRR), which will be incorporated into the final BAR for submission to DFFE for decision-making.

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**LIST OF ACRONYMS AND ABBREVIATIONS**

<b>BAR</b>	Basic Assessment Report
<b>CBA</b>	Critical Biodiversity Areas
<b>DEA</b>	Department of Environmental Affairs
<b>DFFE</b>	Department of Forestry Fisheries and the Environment
<b>DWS</b>	Department of Water and Sanitation
<b>EA</b>	Environmental Authorisation
<b>EIA</b>	Environmental Impact Assessment
<b>EMPr</b>	Environmental Management Programme
<b>I&amp;APs</b>	Interested and Affected Parties
<b>km</b>	Kilometers
<b>kV</b>	Kilovolts
<b>NEMA</b>	National Environmental Management Act
<b>NEFPA</b>	National Freshwater Ecosystem Priority Areas
<b>PPP</b>	Public Participation Process
<b>RE</b>	Renewable Energy
<b>SACAA</b>	South African Civil Aviation Authority
<b>SAIPPA</b>	South African Independent Power Producers Association
<b>SAPVIA</b>	South African Photovoltaic Industry Association
<b>SAWEA</b>	South African Wind Energy Association
<b>CAA</b>	Civil Aviation Authority
<b>SANRAL</b>	South African National Resource Agency
<b>SAHRA</b>	South African Heritage Resources Agency
<b>SOC</b>	State Owned Company
<b>WULA</b>	Water Use Licence Application

## 1 INTRODUCTION

Eskom Holdings SOC Ltd (hereafter referred to as Eskom) proposes a new 132kV substation, expansion of the 400kV Majuba substation, and associated infrastructure. The proposed project is located within the Pixley KaSeme Local Municipality, under the jurisdiction of the Gert Sibande District Municipality in the Mpumalanga Province.

In response to high interest and inquiries, Eskom has strategically decided to install two new fully equipped 400/132kV 500 MVA transformer bays at Majuba Main Transmission Station (MTS). This will ensure the availability of a total capacity of 950 MW unfirm and 475 MW firm capacity, accommodating 671 MW of 132kV IPP (Independent Power Producer) connections. The 2022 Transmission Development Plan anticipates a significant increase in demand for Renewable Energy (RE) generation by 2030, specifically requiring 31,095 MW of photovoltaic and wind generation, with a substantial portion needed by 2027. However, many transmission supply areas lack the necessary capacity, underscoring the importance of attracting and facilitating RE generation connections, particularly in areas with minimal network infrastructure. Grid Planning recognizes the need for additional transformer capacity at substations located within future areas of interest for RE generation. These areas are identified through a comprehensive process, including analysing applications from bid windows 5 and 6 and feedback from an industry survey conducted among various RE associations.

The proposed project entails the following:

- **132kV Yard:**
  - Establish new 2 x 400/132 kV 500 MVA transformers.
  - 132 kV yard includes 4 feeder bays and 2 spare bays.
  - Cater for Fault Current Limiting Reactors (FCLRs) in series with transformers and between transformer pairs (1 x FCLR / busbar).
- **400kV Yard**
  - Extend the 400kV yard.
  - Equip 2 x 400 kV transformer bays.
  - Install a 400kV bus section to reduce outages and to switch between busbars during construction.
  - Repositioning 3 towers within the 400kV Alpha line to accommodate the new transformer bays.
  - Relocate the existing 60m microwave tower to accommodate the new transformer bays and elevate it to 65m.
- **Associated Infrastructure**
  - The access road will be widened by approximately 6m and upgraded.

The proposed development triggers the NEMA EIA listed activities as contained in Government Notice Regulations (GN R), GN 983, and GNR 985. As such, Eskom is required to undertake a Basic Assessment (EIA) process and obtain an Environmental Authorisation (EA) in line with the requirements of the EIA Regulations of 2014 as amended,



promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Furthermore, the project is identified as a Strategic Infrastructure Project, and confirmation is enclosed. The proposed project is located within 500 meters of a watercourse in the Majuba Nature Reserve, adjacent to the Majuba Power Station. Consequently, it activates regulatory requirements under Section 21 of the National Water Act No. 36 of 1998. Subsequently, Eskom appointed Nsovo Environmental Consulting to undertake the necessary authorisation process to comply with the legislation requirement. The project proponent is Eskom Holdings SOC Limited; the Competent Authority (CA) is the National Department of Forestry, Fisheries, and the Environment (DFFE).

## 2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Eskom has appointed Nsovo as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements stipulated in regulations 13(1) of the NEMA 2014 EIA Regulations, as amended. Nsovo is, therefore:

- Independent and objective;
- Has expertise in conducting EIAs;
- Ensures compliance with the EIA Regulations;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant, relevant environmental authority, specialists, and Interested and Affected Parties (I&APs).

Table 1 provides details of the EAP and relevant experience. The EAP CV and Declaration is attached in **Appendix A**.

**Table 1: Details of the Environmental Assessment Practitioner (EAP)**

<b>Name of Company</b>	Nsovo Environmental Consulting
<b>Person Responsible</b>	Munyadziwa Rikhotso
<b>Professional Registration</b>	EAP (EAPASA): Reg 2019/1156 Certified Nat.Sci: (SACNASP)
<b>Telephone Number</b>	087 803 9294
<b>Email</b>	<a href="mailto:munyadzi@nsovo.co.za">munyadzi@nsovo.co.za</a>
<b>Qualifications and Experience</b>	BSc Hons Environmental Science <b>20 years of experience</b>
<b>Project Related Expertise</b>	In terms of project-related expertise, the Environmental Assessment Practitioner has undertaken projects of varying scale and complexity, including:

	<ul style="list-style-type: none"> <li>• Integrated Environmental Impact Assessment and WULA for Exxaro discard dump expansion (2021).</li> <li>• Integrated Environmental Impact Assessment and WULA for Bushveld Vanchem Expansion project (2021).</li> <li>• Integrated Environmental Impact Assessment and WULA for Grammatikos Vogelfontein project (2021).</li> <li>• EIA for the proposed Tubatse Strengthening Phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province (2018).</li> <li>• EIA for the proposed Maphutha-Witkop powerline in Limpopo Province (2018).</li> </ul>
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## 2.1 DETAILS OF THE APPLICANT

The project applicant is Eskom Holdings SOC Limited. Their details are included in Table 2 below.

**Table 2: Details of the Applicant**

<b>Name of Company</b>	Eskom Holdings SOC Limited
<b>Physical Address</b>	Megawatt Park, Maxwell Drive, Sunninghill, Sandton, 2001
<b>Postal Address</b>	P.O. BOX 1091, Johannesburg, 2001

## 2.2 DETAILS OF THE SPECIALIST

To adequately identify and assess potential environmental impacts associated with the proposed project, Nsovo has appointed specialist sub-consultants listed in Table 3 below to conduct various specialist impact assessments. The DFFE Screening tool, EAP site assessment, and judgment based on available information and experience informed the specialist requirement.

**Table 3: List of specialist sub-consultants**

Specialist Study	Company	Name of Specialist
Heritage Impact Assessment	(AHS) Archaeological and Heritage Services Africa (Pty) Ltd	Edward Matenga
Aquatic Impact Assessment	Ecology International	Byron Grant
Terrestrial Biodiversity Assessment	Mboneni Ecological Services (Pty) Ltd	Avhafarei Phamphe
Wetland Impact Assessment	Watermakers	Willem Lubbe
Agricultural Impact Assessment	Nsovo Environmental Consulting	Tshiamo Setsipane
Paleontology	Marion Bamford Consulting	Prof. Marion Bamford

Other themes that were assessed include the following:

- Civil Aviation; and
- Defence.

Eskom Engineering confirmed that the area earmarked for the proposed activities is an existing terrace; the soil has been engineered. Soil as the extension will be on the existing terrace. However, test pits will be dug at the tower location. A geotechnical assessment will not be required.

In line with the DFFE's recommendation during the pre-application meeting, site sensitivity verification was conducted for the different themes to confirm the screening tool's sensitivity ratings and the outcomes are presented herein.

### **3 DESCRIPTION OF THE LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND THE LOCATION OF THE ACTIVITY ON THE PROPERTY**

This section describes the proposed location of the substation and associated infrastructure. Its primary aim is to provide the environmental aspects of the proposed development's location and describe the surroundings.

#### **3.1 LOCALITY OF THE PROPOSED PROJECT**

##### **3.1.1 PROVINCE**

The proposed development will be undertaken within the Mpumalanga Province of South Africa.

##### **3.1.2 MUNICIPAL WARDS**

The proposed substation and associated infrastructures fall within Wards 6 and 8 of Pixley Ka Seme Local Municipality. Refer to Figure 1 below for municipal wards.

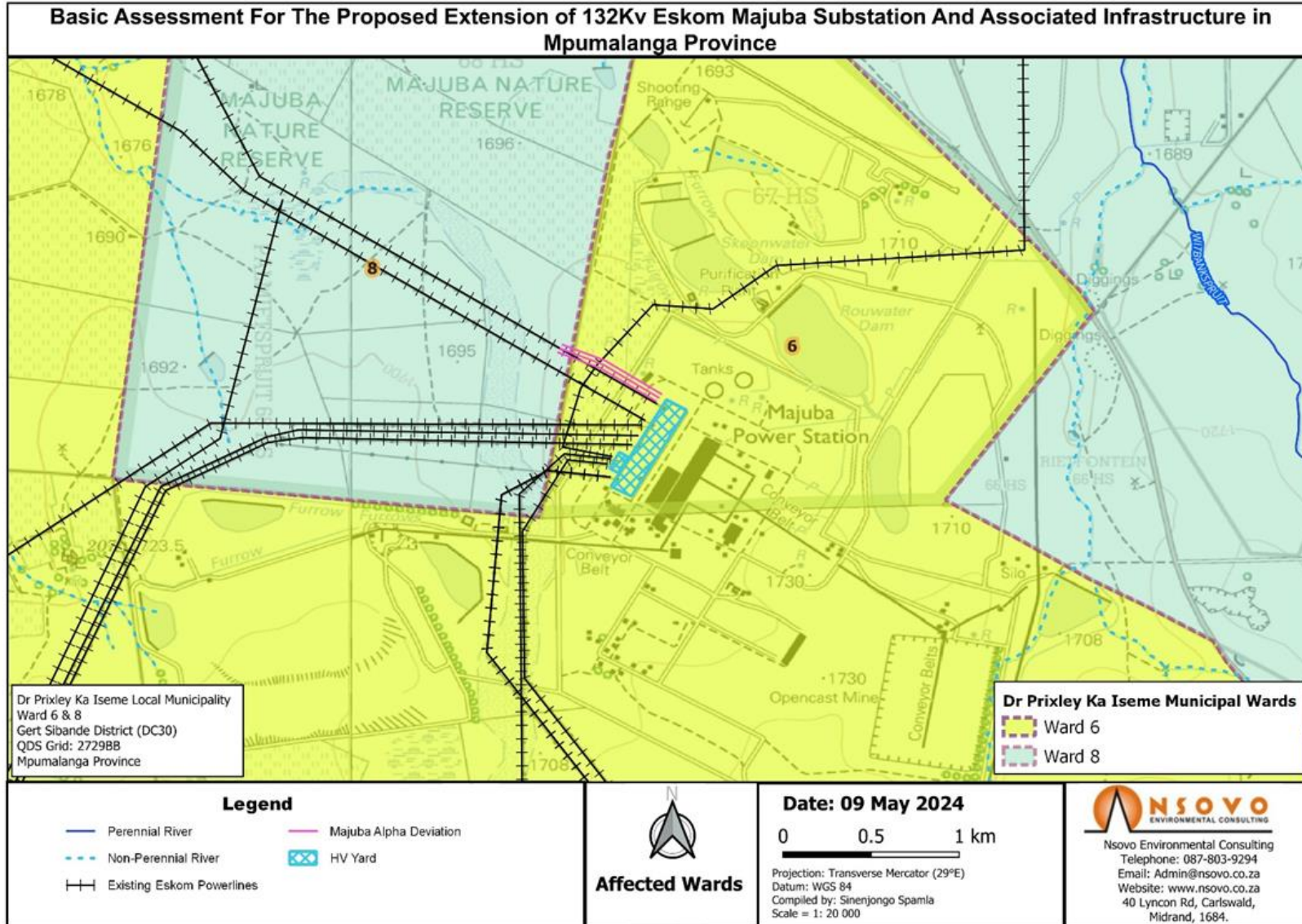


Figure 1: Project Locality and affected Wards

### 3.1.3 AFFECTED FARMS

The farms affected by the proposed development, as well as the 21-digit Surveyor General Code, are listed in **Appendix G**. The GPS center coordinates for the proposed 132kV substation are shown in Table 4 below.

**Table 4: Centre coordinates of the proposed extension.**

Farm/Portions	Centre Coordinates	Surveyor General Codes
Majuba Power Station NO 263 HS	27° 2' 52,253"S 30° 9' 43,663"E	TOHS00000000026300000
Palmeitspruit 68 HS	27° 3' 36,1584"S 29° 45' 16,2576"E	TOHS00000000006800000

### 3.1.4 LOCALITY MAP

Figure 2 Below is a locality map representing the proposed study area on a scale of 1:50 000. The proposed study area is primarily industrial, within an existing operational Eskom Majuba Power Station. On the other hand, the proposed project site is within the Majuba Nature Reserve, a reserve administered by the Eskom Majuba Power Station. The A3 Locality Map is attached in **Appendix A**.

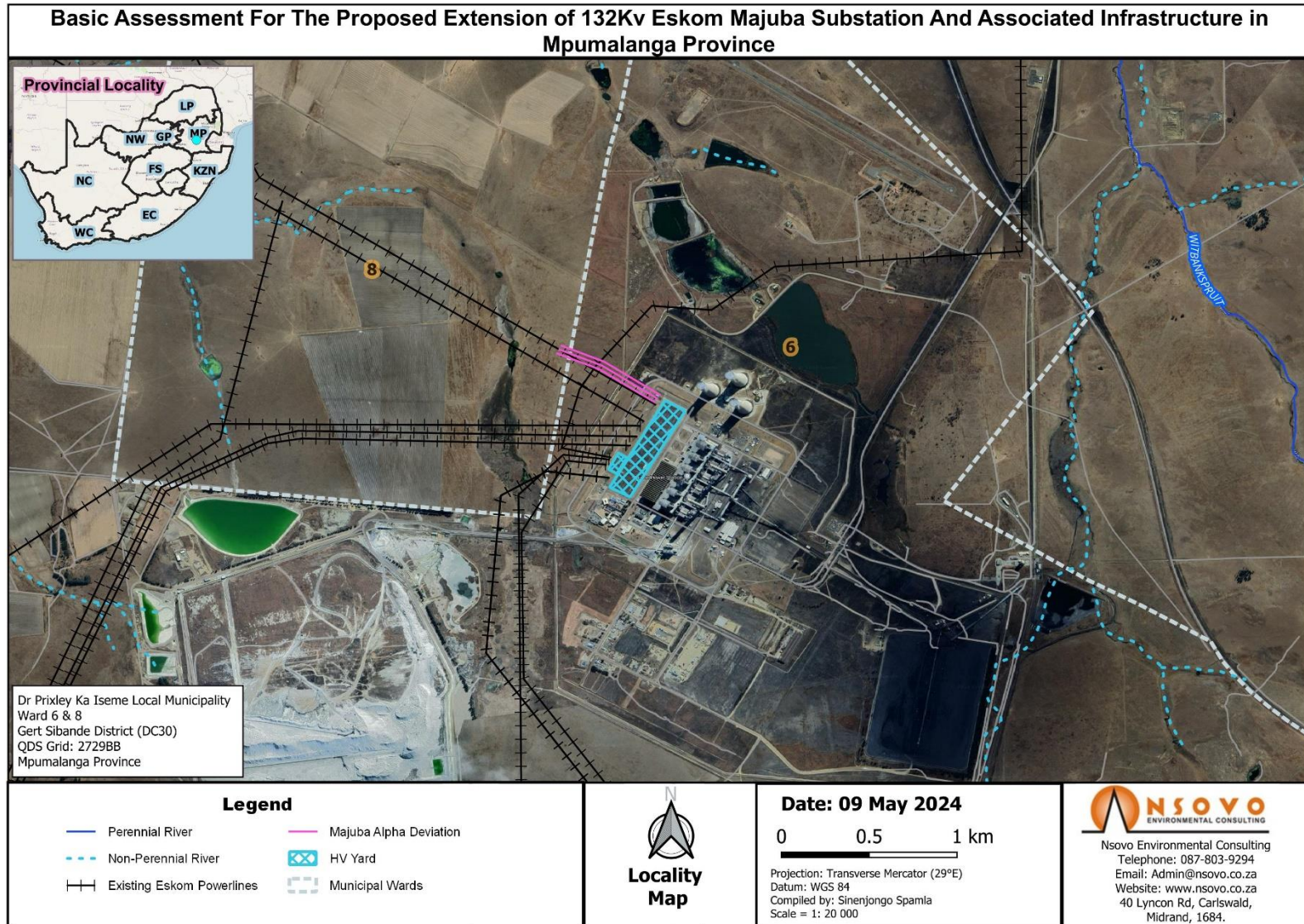


Figure 2: Project locality map

## 3.2 SURROUNDING LAND USES

This section describes the land uses within and around the proposed study area.

### 3.2.1 ECONOMIC ACTIVITIES

The primary economic sectors in the Pixley Ka Seme Local Municipality are agriculture, community services, construction, mining, electricity, finance, manufacturing, transport, and trade.

### 3.2.2 RESIDENTIAL

The closest community to the study area is Bergvliet, approximately 8 km away. Schurvepoort is a low-medium income residential household adjacent to the Majuba Power Station. Amersfoort and Perdekop residential communities are approximately 12 km and 15 km, respectively.

### 3.2.3 ROAD NETWORK

Pixley Ka Seme's total road network spans 278 km, with 85 km surfaced and 193 km gravel. The municipal roads are in poor condition due to heavy coal haulage traffic, which increases maintenance costs for all government levels. The N11, connecting Limpopo Province and Northern KZN through Ermelo, Amersfoort, and Volksrust, is a vital freight and potential tourism route in good condition that can spur economic development in the region.

Other Regional roads include the R23 (Volksrust to Standerton), R35 (Amersfoort to Bethal), and R543 (Volksrust to Piet Retief). Many local and provincial roads need adequate graveling or tarring. The proposed project is within an existing power station, so primary access will be the current roads used to access the Majuba Power Station. Access to the site will be through an existing gravel road that will be widened by approximately 6m as part of the project.

### 3.2.4 SUBSTATION AND ASSOCIATED INFRASTRUCTURE

The proposed project is within the existing Eskom Majuba Power Station a coal-fired power station with a total capacity of approximately 4,110 MW across six generating units. It features coal handling and storage systems, natural draft cooling towers, and ash handling facilities. The station's power is transmitted via 400 kV high-voltage lines connected to the national grid. It also includes water supply infrastructure for steam generation and cooling, advanced control and monitoring systems, and on-site maintenance workshops, ensuring efficient and reliable electricity production.



Figure 3: Majuba Power Station Photographs



4 A PLAN THAT LOCATES THE PROPOSED ACTIVITY OR ACTIVITIES APPLIED FOR, AS WELL AS ASSOCIATED STRUCTURES AND INFRASTRUCTURE AT AN APPROPRIATE SCALE

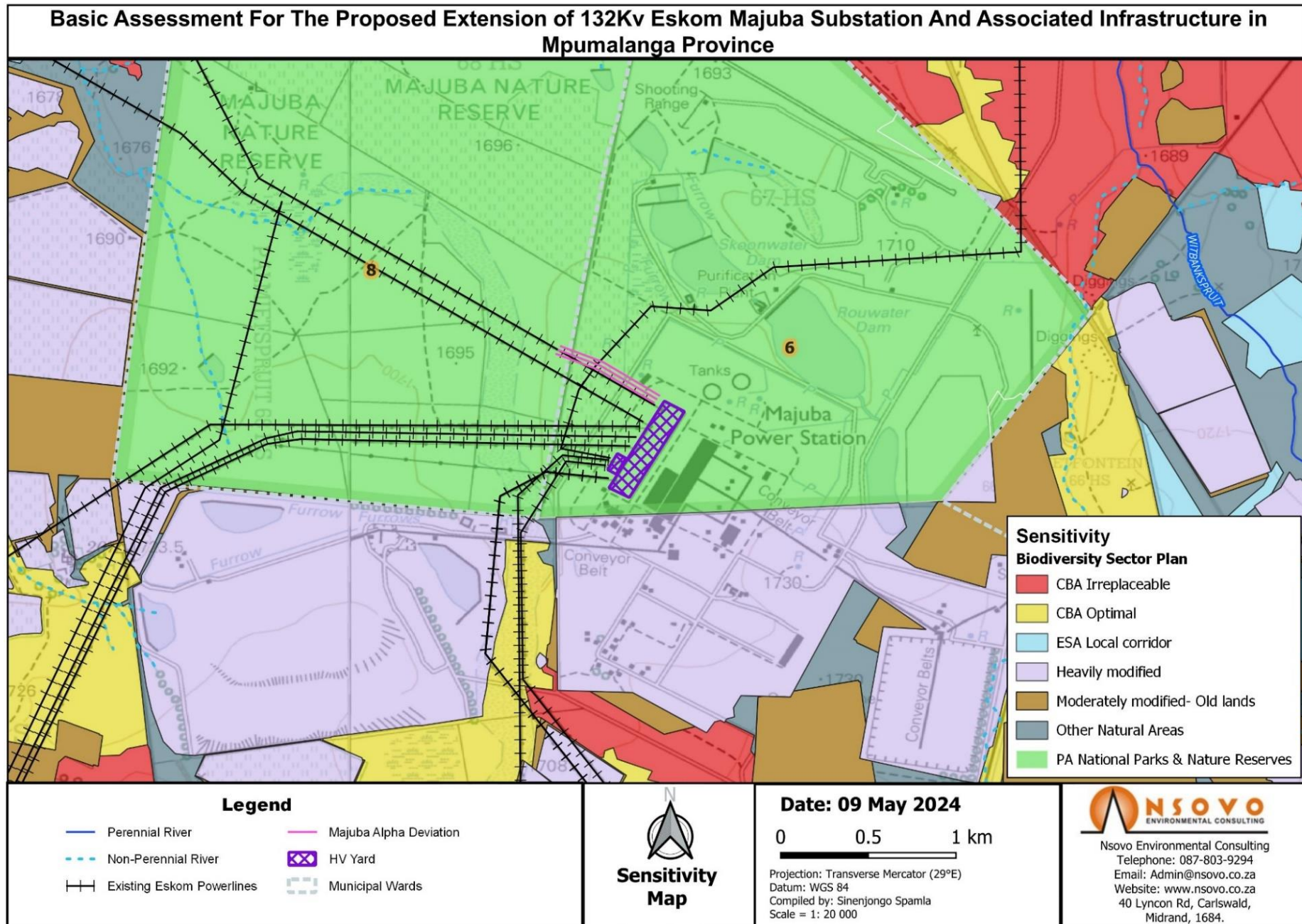


Figure 4: Majuba Biodiversity Sensitivity Map

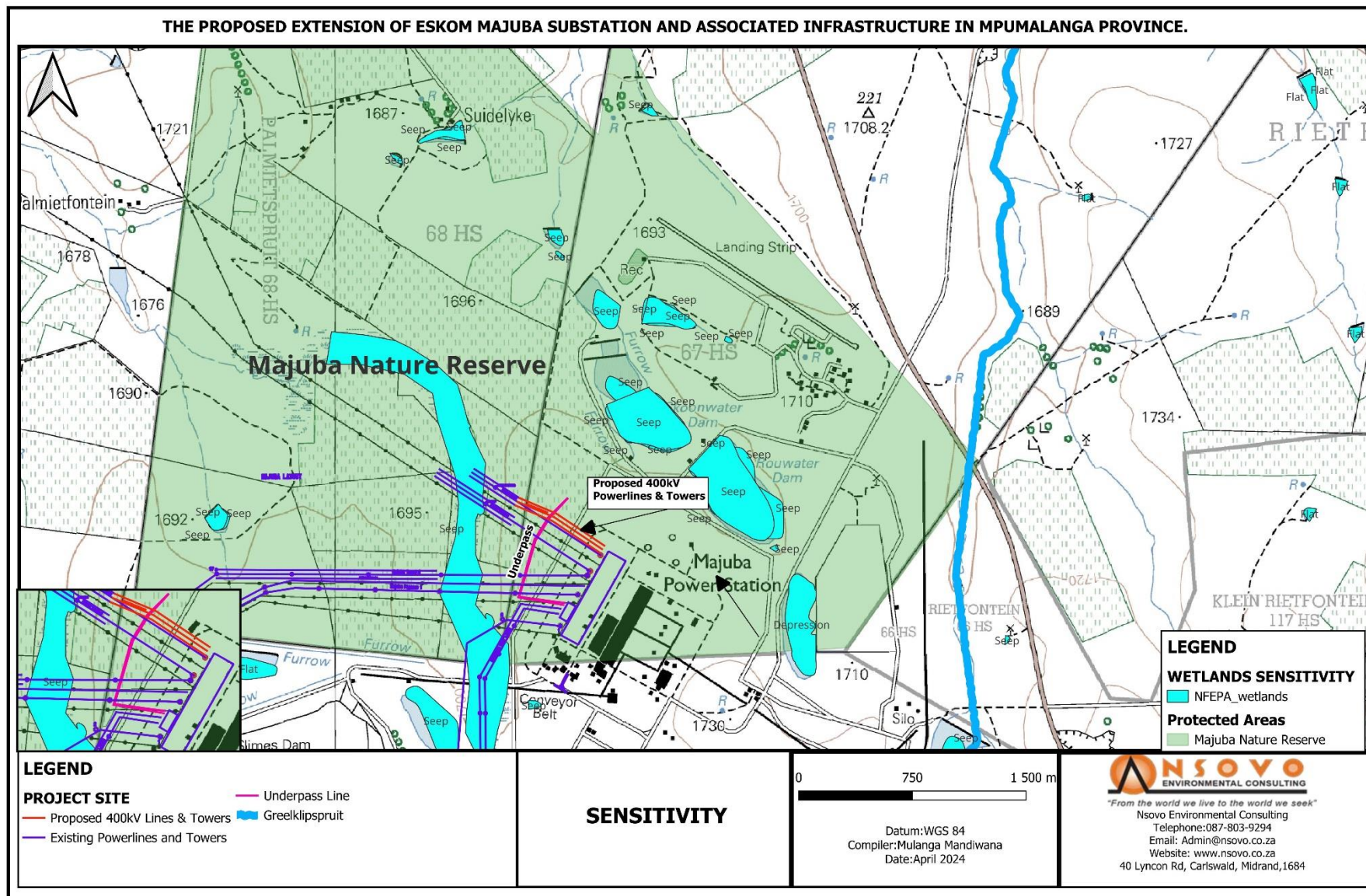


Figure 5: Majuba Wetland Sensitivity Map

## 5 DESCRIPTION OF THE PROPOSED ACTIVITY

This section describes the proposed activities, focusing on the listed activities that trigger the Basic Assessment process.

### 5.1 BACKGROUND AND THE PROPOSED SCOPE OF WORK

As highlighted above, the 2022 Transmission Development Plan generation assumptions project demand for 31,095 MW of photovoltaic and wind generation by 2030, with 16,604 MW required as early as 2027. Given the limited or nonexistent capacity in many Transmission supply areas, there's a critical need to attract and facilitate Renewable Energy power generation connections, particularly in regions where grid capacity remains underutilized, often necessitating minimal network infrastructure. Grid Planning has identified the necessity for additional transformer capacity at substations within prospective RE generation zones. These areas were pinpointed through an analysis of applications processed in bid window 5 (BW5) and those received for bid window 6 (BW6), alongside an industry survey conducted among various RE associations (SAWEA, SAIPPA, SAPVIA). In response to significant interest and inquiries for 671 MW of 132kV Independent Power Producer (IPP) connections at Majuba MTS, a strategic decision was made to install two new fully equipped 400/132kV 500 MVA transformer bays. This initiative aims to ensure the availability of a total capacity of 950 MW unfirmed and 475 MW firm, meeting the burgeoning demand and fostering sustainable energy growth.

### 5.2 ACTIVITIES ASSOCIATED WITH THE PROJECT

#### 5.2.1 CONSTRUCTION METHOD

The proposed 132kV yard will connect to the existing 400kV yard, which is planned to be extended. Based on a similar project estimate using the provided scope of work, the construction method for the 132/400kV substation involves establishing a new 132 kV yard with 2 x 400/132 kV 500 MVA transformers, extending the 400 kV busbar and equipping 2 x 400 kV and 2 x 132 kV transformer bays along with 4 x 132 kV feeder bays. This includes constructing foundations, installing switchgear and wiring, and performing electrical tests. Such projects also cater for the installation of transformer FCLRs, relocating feeder bays, terminal towers, lines, telecoms, and secondary plants as required. Finally, the installation and commissioning of necessary secondary plant equipment will ensure the substation is fully operational and integrated with the primary systems, thereby facilitating the smooth and efficient generation and distribution of renewable energy.

#### 5.2.2 ACCESS ROADS

The access road will be widened and upgraded to accommodate transformers (approximately 6m).

### 5.2.3 TOWERS LOCATIONS

Three towers will be relocated to a new footprint within the 400 kV servitude and connected to the existing yard.

### 5.2.4 RELOCATION OF MAST

Relocating the existing 60m microwave tower to accommodate the new transformer bays and elevate it to 65m. The figure below depicts the proposed new site.



Figure 6: Proposed Mast Position

### 5.2.5 COMPLETION OF CONSTRUCTION WORK

Once construction work is complete, the affected site areas will be rehabilitated as per the specifications of the EMPr and the approved Method Statements, among other activities. The rehabilitation activities will include:

- Removal of excess building material and waste;
- Repairing any damage caused by construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous vegetation where necessary.

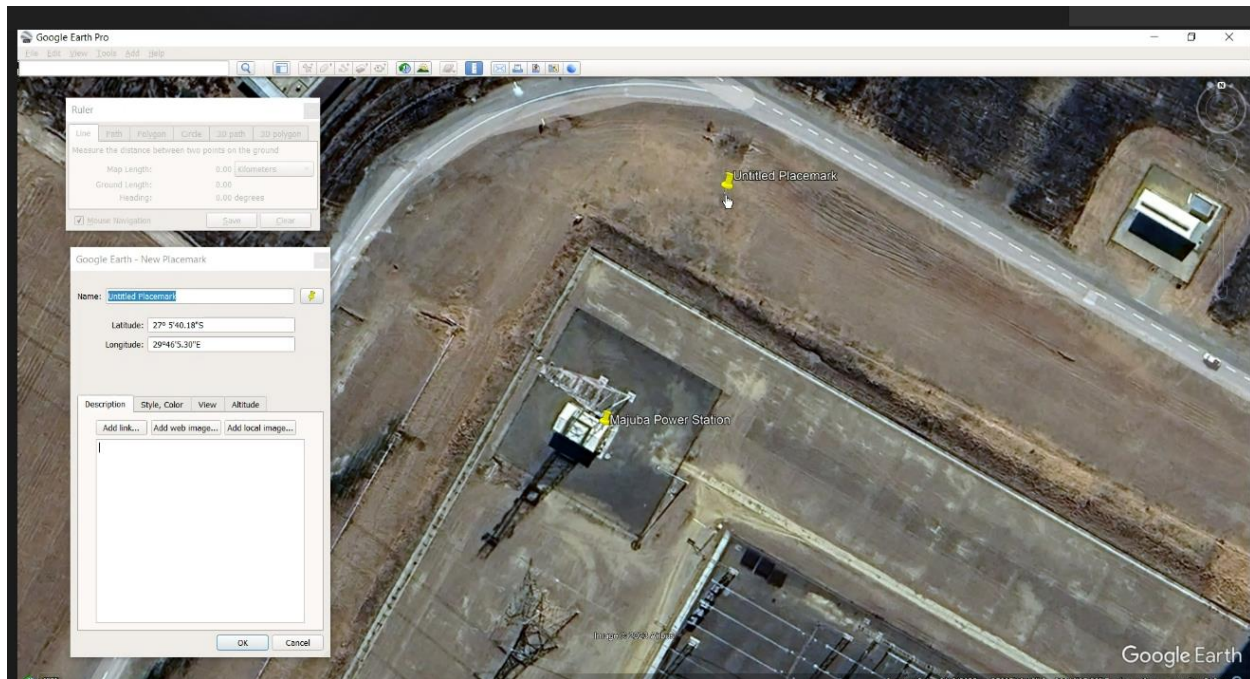


Figure 7: Area earmarked for the proposed project with engineered soils.

### 5.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The following listed activities (Table 5) are triggered by the proposed development in terms of EIA Regulations as amended:

Table 5: Listed Activities triggering EIA Regulations applicable to the proposed project.

Regulation	Listed activities	Activity/Project Description
<b>GN R. 983 Activity 11</b>	The development of facilities or infrastructure for the transmission and distribution of electricity-  (i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.	The proposed project entails the development of the 132kV Eskom Majuba Substation and associated infrastructure.
<b>GN R 983 Activity 47</b>	The expansion of facilities or infrastructure for the transmission and distribution of electricity where the expanded capacity will exceed 275 kilovolts and the development footprint will increase.	Eskom Majuba proposes to extend their 400kV Yard by 35m x 128 (0.448ha).

Regulation	Listed activities	Activity/Project Description
<b>GN R 983</b> <b>Activity 56</b>	The widening of a road by more than 6 meters or the lengthening of a road by more than 1 kilometer— (i) where the existing reserve is wider than 13,5 meters;	The access road will be widened and upgraded to accommodate transformers (approximately 6 m).
<b>GN R 983</b> <b>Activity 28</b>	Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes, or afforestation on or after 01 April 1998 and where such development: (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare, excluding where such land has already been developed for residential, mixed, retail, commercial, industrial, or institutional purposes.	The project is within the Majuba Nature Reserve, administered by the Eskom Majuba Power Station.
<b>GN R 985</b> <b>Activity 3 a &amp; b, f</b> <b>(aa)</b>	The development of masts or towers of any material or type used for telecommunication broadcasting or radio transmission purposes where the mast or tower- (a) is to be placed on a site not previously used for this purpose and (b) will exceed 15 meters in height – but excluding attachments to existing buildings and masts on rooftops.	The proposed activities will require relocating an existing 60-meter microwave tower to a new location within the development area and elevating it to 65 meters.

#### 5.4 WATER USE LICENCE

The proposed project is less than 500 meters from the watercourse, within the Majuba Nature Reserve, next to Majuba Power Station. For the wetlands' sensitivity map, refer to Figure 5 above. Table 6 provides the listed activities triggered by the proposed project. The proposed project triggers activities under Section 21 of the National Water Act No. 36 of 1998 as follows:

**Table 6: Triggered Water uses**

Water uses	Purpose/Description
Section 21: I. (c) - impeding or diverting the flow of water in a watercourse.	<ul style="list-style-type: none"> <li>Establishment of a new 132 kV Yard, with 2 x 400/132 kV 500 MVA transformers</li> </ul>
II. (i) - is altering the bed, banks, course, or characteristics of a watercourse	<ul style="list-style-type: none"> <li>Extending the 400 kV busbar</li> </ul>
	<ul style="list-style-type: none"> <li>Widening of the existing access road</li> </ul>

## 6 A DESCRIPTION OF THE POLICY AND LEGISLATIVE CONTEXT WITHIN WHICH THE DEVELOPMENT IS PROPOSED

The EIA Regulations of December 2014, as amended, require a description of applicable legislation in the Basic Assessment report. Therefore, this section lists and describes the acts and legislation relevant to the proposed development. Table 6 below summarises the current South African environmental legislation pertinent to the proposed development.

The Basic Assessment process considered municipal policies, plans, by-laws, Eskom policies, and world best practices. The list of legislations that apply to the project is not exhaustive; however, it provides a guideline for the relevant aspects of each Act.

**Table 7: Legislation pertaining to the proposed project.**

Aspect	Relevant Legislation	Brief Description
Environment	National Environmental Management: Act 1998 (Act No. 107 of 1998) as amended.	The overarching principles of sound environmental responsibility reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) apply to all listed projects. Construction and operation of activities shall be conducted per the generally accepted principles of sustainable development, integrating social, economic, and environmental factors.

Aspect	Relevant Legislation	Brief Description
		<p>This application for Environmental Authorisation complies with the requirements of the NEMA and EIA Regulations of 2014, as amended.</p>
Biodiversity	<p>National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)</p>	<p>The National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) aims to manage and conserve South Africa's biodiversity within the framework of the NEMA and protect species and ecosystems that warrant national protection. The National Spatial Biodiversity Assessment was developed as part of its implementation strategy.</p> <p>The project is within the nature reserve, and according to the DFFE Screening Tool, the Biodiversity sensitivity is high.</p> <p>The site verification was conducted concurrently with the Terrestrial biodiversity impact assessment, and during the survey, it was concluded that the proposed development site falls within Low (inside the Power Station) to High (within the Nature Reserve) categories in terms of ecological sensitivity. However, the proposed development is situated along the existing servitude, and therefore, the disturbances to the natural ecosystems and vegetation clearance will be relatively small. The mitigation measures within the Nature reserve must be enforced.</p>
Protected Areas	<p>National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003)</p>	<p>National Environmental Management: Protected Areas Act, 2003 (Act No.57 of 2003) aims to provide conservation and management to South African Protected areas such as Nature reserves and National parks.</p> <p>The proposed project is located within the Majuba Nature Reserve.</p>



Aspect	Relevant Legislation	Brief Description
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	<p>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the need for cultural and heritage impact assessment in areas earmarked for development exceeding 0.5ha. The Act makes provision for the potential destruction of existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).</p> <p>A Heritage Impact Assessment was conducted, and it was confirmed that no obvious heritage artifacts were noted.</p>
Conservation of Agricultural Resources Act	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	<p>The objective is to provide control over the utilisation of the natural agricultural resources of the Republic to promote the conservation of soil, water sources, and vegetation, combating weeds and invader plants, and for matters connected to that.</p> <p>The Screening Tool rated Agricultural Resources Sensitivity as High; however, following verification, it was confirmed to be low. The proposed project's immediate footprint has engineered soils.</p>
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	<p>The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable noise management and control laws refer to the National Noise Control Regulations issued in terms of the Environmental Conservation Act, 1989 (Act 73 of 1989).</p> <p>Contractors occupying the site may generally increase the ambient noise levels in the area. Additional noise may be expected from increased heavy-duty traffic, construction equipment, and activities.</p>
Water	National Water Act, 1998 (Act 36 of 1998)	This Act provides fundamental reform of laws relating to water resources and use. The preamble recognises that water resource management aims to achieve sustainable

Aspect	Relevant Legislation	Brief Description
		<p>water use for all users. Protecting the quality of water resources is necessary to ensure the sustainability of the nation's water resources in the interests of all water users.</p> <p>The proposed Substation is situated within 500 m of the wetland, which requires a Water Use Licence from the Department of Water and Sanitation.</p>
Waste	National Environmental Management: Waste Act 59 of 2008	<p>This act fundamentally reforms the law regulating waste management to protect health and the environment by providing reasonable measures for preventing pollution and ecological degradation and securing ecologically sustainable development. It also ensures the provision of national norms and standards for regulating waste management by all spheres of government. The National Environmental Management: Waste Act provides for specific waste management measures, licensing and control of waste management activities, remediation of contaminated land, compliance and enforcement, and related matters.</p> <p>The proposed project can generate general waste, which will be discarded at a licensed facility and does not trigger a waste license.</p>
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996)	<p>The Constitution of South Africa, 1996 (Act No. 108 of 1996) provides for an environmental right (contained in the Bill of Rights, Chapter 2). The state is obliged "to respect, protect, promote and fulfill the social, economic and environmental rights of everyone."</p> <p>The environmental right states that:        "Everyone has the right –        a) To an environment that is not harmful to their health or well-being; and</p>

Aspect	Relevant Legislation	Brief Description
		<p>b) To have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that –</p> <ul style="list-style-type: none"> <li>• Prevent pollution and ecological degradation;</li> <li>• Promote conservation; and</li> <li>• Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”</li> </ul>
Civil Aviation	Civil Aviation Act 13 of 2009	<p>As outlined in Part 139.01.30 of the Civil Aviation Regulations (GN R425, GG 35398 of 1 June 2012), Buildings or other objects which will constitute an obstruction or potential hazard to aircraft moving in the navigable air space in the vicinity of an airport or navigation aid, or which will adversely affect the performance of the radio navigation or instrument landing systems must not be erected or allowed to come into existence without the prior approval of the Director.</p> <p>According to the DFFE Screening Tool Report, the Civil Aviation Theme is high. The Amersfoort Aerodrome is approximately 13km from the proposed site, outside the 8 km high-risk zone but within the 15km medium-risk zone. Other unlicensed aerodromes were also identified within proximity to the site. Requisite microwave mast clearance must be sought from the CAA.</p>
Defence	Defence Act 42 of 2002	<p>The Defence Act 42 of 2002 is a comprehensive piece of legislation in South Africa that governs various aspects of national defence, military organization, and security matters.</p> <p>The screening tool assessed the proposed site as having low sensitivity to Defence concerns. Therefore, according to protocols for Specialist (GN.320) of March 2020, there are no anticipated adverse impacts on the defence.</p>
Protection of Information	The Protection of Personal Information	Part of this responsibility is to protect the information inside the organisation and be responsible when it comes

Aspect	Relevant Legislation	Brief Description
	Act, 2013 (Act No. 4 of 2013)	to storing and sharing personal information. Therefore, information such as email addresses and contact numbers will not be distributed during the Public Participation Process.

## 7 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

This section justifies the need for the proposed project with a focus on the benefits and its importance to the people within the Pixley Ka Seme Local Municipality, particularly the affected communities.

### 7.1 MOTIVATION FOR THE DEVELOPMENT

Eskom's transmission and distribution network plays a pivotal role in South Africa's economic and socio-economic development by ensuring a reliable supply of high-quality electricity. This infrastructure is crucial for powering industries, enabling access to education, improving healthcare, and creating job opportunities. As electricity demand evolves, enhancing the distribution system becomes imperative to effectively meet these growing needs. Therefore, the proposed project aligns with Eskom's strategic goals to strengthen service delivery and infrastructure, ensuring sustainable development and meeting the dynamic requirements of the region.

### 7.2 BENEFITS OF THE PROJECT

Expanding the 400kV infrastructure and developing a new 132kV substation represents a significant opportunity for enhancing socio-economic and ecological outcomes. The provision of electricity yields numerous social benefits for governmental entities, individuals, industries, and communities alike, enabling developmental progress and fostering the growth of small and medium enterprises. This, in turn, has the potential to bolster disposable incomes. To fully capitalize on these advantages, the proposed project is imperative.

Advantages of the proposed powerline include:

- **Capacity Enhancement:** Adding transformer capacity at substations in areas identified for renewable energy (RE) generation allows for integrating additional photovoltaic and wind generation. This expansion ensures that the substation can handle the increased load from new RE sources, meeting the demand projected in the Transmission Development Plan.
- **Reliability and Resilience:** The extension improves the reliability of the grid by strengthening the substation's infrastructure. With increased capacity and upgraded equipment, the substation can better withstand fluctuations in demand and potential disruptions, enhancing overall grid resilience.
- **Facilitation of RE Integration:** Extending the substation directly supports the goal of enabling RE generation connections. By providing additional transformer capacity, the substation becomes better equipped to handle the influx of renewable energy from sources like solar and wind, thereby promoting the transition to a cleaner energy mix.
- **Support for Economic Growth:** The substation extension supports the integration of renewable energy and contributes to economic growth.

This project aims to strengthen the electricity arm, allow load growth, and improve supply reliability.

## 8 A MOTIVATION FOR THE PREFERRED SITE, ACTIVITY, AND TECHNOLOGY ALTERNATIVE

Evaluating alternatives is crucial in the EIA Basic Assessment (BA) process. These alternatives undergo assessments based on their environmental, technical, and economic feasibility. Once identified, the preferred alternative is presented to the authorities for approval.

According to the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended, feasible and reasonable alternatives must be identified and considered within the Environmental Impact Basic Assessment Report. The Regulation defines alternative as follows: *"...in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:*

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

The various alternatives must be assessed regarding both environmental acceptability and economic feasibility. The selection of the preferred alternative must be based on several factors:

- Public input, ascertained through the PPP;
- Specialists' recommendations;
- Environmental constraints;
- Technical feasibility;
- Economic cost-benefit analysis;
- Best practicable environmental option, i.e., the option that provides the most benefit or causes the least damage to the environment as a whole at a cost acceptable to society in both the long and short term; and
- Optimisation of existing infrastructure, such as access roads.

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

In terms of Section 24 of NEMA, the proponent must demonstrate that alternatives have been described and investigated in sufficient detail during the Environmental Authorisation application process. It is important to highlight

that alternatives must be practical, feasible, reasonable, and viable to cater for an unbiased approach to the project and, in turn, to ensure environmental protection. The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the proposed activity's environmental benefits and reducing or avoiding potentially significant negative impacts.

Various role players must contribute to their identification and evaluation to ensure full disclosure of alternative activities. Stakeholders have an important contribution to make during the EIA Process, and each role is detailed as follows:

The role of the environmental practitioner is to:

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

The role of the proponent (Eskom) is to:

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

The role of the public is to:

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

The applicability of each alternative type to the proposed project is outlined in Table 8 must be highlighted that the alternatives presented in the table are derived from both the EIA Regulations (2014) as amended and the Department of Environmental Affairs (now Department of Forestry, Fisheries, and the Environment) 2004 Integrated Environmental Information Series on the Criteria for determining alternatives in EIA. This report will further discuss where the alternative applies to the project.

Table 8: Project alternative types (DFFE IEM Series 11)

Alternative	Applicability
<b>No-go Option</b>	The 'no-go' alternative is sometimes referred to as the 'no-action' alternative (Glasson <i>et al.</i> , 1999) and, at other times, the 'zero-alternative.' It assumes that the activity does not go ahead, implying a continuation of the current situation or the status quo. This alternative must be discussed on all projects as it allows for assessing impacts should the activity not be undertaken. <b>This alternative is discussed in this report and not recommended.</b>
<b>Activity alternatives</b>	These are sometimes referred to as project alternatives, although the term activity can be used broadly to embrace policies, plans, programs, and projects. Consideration of such alternatives requires a change like the proposed activity. This would entail a process where a different project is proposed. <b>Only one activity alternative is discussed in this report.</b>
<b>Location/ property alternatives</b>	Location alternatives could be considered for the entire proposal or a proposal component. The latter is sometimes considered under site layout alternatives. A distinction should also be drawn between alternative locations that are geographically quite separate and alternative locations nearby. In the case of the latter, alternative locations in the same geographic area are often referred to as alternative sites. Site alternatives do not apply to the proposed project, as they involve expanding the existing 400kV Yard and incorporating the new 132kV component connecting directly to this expansion; as such, the location is already determined, and only the layout of the new infrastructure within the available site may be assessed. Consequently, no alternative substation sites will be considered for this development. <b>Alternative substation locations are not discussed in this report.</b>
<b>Process alternatives</b>	Various terms are used for this category, including technological alternatives and equipment alternatives. Considering such alternatives includes achieving the same goal using a different method or process. An industrial process could be changed, or an alternative technology could be used. These are also known as technological and equipment alternatives and will be discussed as they apply to the type of pipeline used and the removal of vegetation required. The technology in terms of the overhead powerline type is consistent for most of this area and, therefore, <b>will not be discussed in this report.</b>
<b>Demand alternatives</b>	Demand alternatives arise when a demand for a particular product or service can be met by some alternative means. This applies to the demand for a product or service. An example of this would be where there is a need to provide more electricity. Specific to the proposed project, alternatives regarding the electricity demand will be discussed in



Alternative	Applicability
	<p>detail as the issues around electricity and reliable supply are known. The motivation highlighted that the proposed project aims to meet the RE demand by enabling the RE substation to connect to the proposed substations. The Majuba substation was identified as the most suitable for responding to the identified demand. <b>As part of the feasibility assessment, other alternatives for meeting the demand were assessed; however, the report only focuses on the most preferred (proposed Majuba expansion) as it's the only feasible alternative with the least impact.</b></p>
<b>Scheduling alternatives</b>	<p>These are sometimes known as sequencing or phasing alternatives. In this case, an activity may comprise several components, which can be scheduled in a different order or at different times and, as such, produce different impacts. <b>These do not apply to the project and will not be discussed.</b></p>
<b>Input alternatives</b>	<p>By their nature, input alternatives are most applicable to industrial applications that may use different raw materials or energy sources in their processes. <b>Input alternatives are not relevant to the project.</b></p>
<b>Routing alternatives</b>	<p>Alternative routes, such as power lines, transport, and pipeline routes, are generally considered for linear developments. Although the project seeks to make a few amends along the existing 400kV powerline, no alternatives were considered. <b>Therefore, route alternatives do not apply to this development.</b></p>
<b>Site layout alternatives</b>	<p>Site layout alternatives permit consideration of different spatial configurations of an activity on a particular site. This may include specific components of a proposed development or the entire activity. Site layouts apply to existing substations; however, due to space constraints, the only feasible alternative is the one presented in this report. More so because other options may encroach on the identified wetlands. <b>Only one layout alternative is offered for this project.</b></p>
<b>Scale alternatives</b>	<p>In some cases, activities that can be broken down into smaller units can be undertaken on different scales. For example, a housing development within an overall mixed-use development could have the option of 1,000, 2,000, or 4,000 housing units. Each of these scale alternatives may have different impacts. However, the proposed project will be broken down into smaller units. <b>Scale alternatives do not apply to the proposed project.</b></p>
<b>Design alternatives.</b>	<p>This entails the consideration of different designs for aesthetic purposes or other construction materials to optimize local benefits and sustainability, which would constitute design alternatives. Appropriate applications of design alternatives are pylon towers. Various tower design alternatives have been proposed for this project,</p>

Alternative	Applicability
	including the cross-rope suspension type, guyed-vee suspension tower, narrow base tower, and the self-supporting type. The selection of tower designs will depend on factors such as topographical conditions and visual sensitivity. <b>Therefore, design alternatives do not apply to this development and are not discussed in this report.</b>

### 8.1 MOTIVATION FOR THE PREFERRED LAYOUT WITHIN THE PROPOSED SITE

As highlighted, Site alternatives do not apply to the proposed project, as they involve expanding the existing 400kV Yard and incorporating the new 132kV component connecting directly to this expanded infrastructure. Figure 5 below shows the yard extension layout within the available site.

The project site selection was primarily based on Eskom's pre-feasibility study, which technically determined the broad location based on the project's needs. The environmental and specialist teams then undertook subsequent site visits further to assess the viability of the selected substation location.<sup>5</sup> Detailed Public Participation will also be conducted to ensure the community's input is considered in decision-making.

## 8.2 NO-GO ALTERNATIVE

In accordance with GN R982, the option not to act must be considered. This option is usually considered when the proposed development is envisaged to have significant adverse environmental impacts and mitigation measures cannot effectively ameliorate the identified impacts. The no-go alternative would be not undertaking the proposed development.

## 9 DETAILS OF THE PUBLIC PARTICIPATION PROCESS UNDERTAKEN IN TERMS OF REGULATION 41 OF THE REGULATIONS, INCLUDING COPIES OF THE SUPPORTING DOCUMENTS AND INPUTS

The NEMA EIA Regulations require that during the EIA process, the Organs of State, together with Interested and Affected Parties (I&APs), be informed of the application and allowed to comment on the application.

Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the BAR and EIA processes. The PPP provides I&APs with an opportunity to provide comments, raise issues of concern, or make suggestions that may enhance the project's benefits.

The primary purpose of the PPP report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, I&APs; and
- To ensure that the EIA process fully addresses the issues and concerns raised.

Chapter 6, Regulation 39 through 44 of the 2014 EIA Regulations, stipulates how the PPP should be conducted and the minimum requirements for a compliant process. These requirements include but not limited to:

Fixing a notice board at or on the fence of-

- (i) The proposed site where the activity is to be undertaken (the application relates to); and
- (ii) A place conspicuous to the public at the site's boundary.

Giving written notice to:

- The occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be conducted;
- The owners or persons in control of the occupied land and the adjacent land to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be conducted;
- The municipal councillor of the ward where the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;
- The municipality which has jurisdiction in the area;

- Any organ of the state having jurisdiction in respect of any aspect of the activity; and
- Any other party as required by the competent authority.

Placing an advertisement in

- (i) One of the local newspapers within or around the proposed site

In line with the above, the principle of Public Participation holds that those affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision). One of the primary objectives of conducting the PPP is to provide Interested and Affected Parties with an opportunity to express their concerns and views on issues relating to the proposed project. The principles of public participation are to ensure that the PPP:

- Communicates the interests of and meets the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- Is as inclusive and transparent as possible; it must be conducted in line with the requirements of Regulations 39 through 44 of the EIA Regulations as amended.

## 9.1 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process aligns with the process contemplated in Regulations 39 through 44 of the EIA Regulations as amended, in terms of NEMA, which provides that I&APs must be notified about the proposed project.

### 9.1.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Stakeholder mapping has been conducted to identify stakeholders who must be involved in this process. Furthermore, directly affected parties within a 100m distance will be notified through site notices. Local newspapers will inform the community of the project and invite them to register as interested and affected parties.

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government departments), landowners, and the public. Notification and request for comments were submitted to the following key stakeholders.

**Table 9: Authorities and Key Stakeholders**

- |  |
|--|
| <ul style="list-style-type: none"> <li>• Department of Fisheries, Forestry and the Environment.</li> <li>• Department of Water and Sanitation.</li> <li>• Dr Pixley Ka Seme Local Municipality.</li> </ul> |
|--|

- Gert Sibande District Municipality.
- Mpumalanga Tourism and Park Agency.
- Mpumalanga Department of Cooperative Governance Human Settlement and Traditional Affairs.
- Mpumalanga Department of Agriculture and Rural Development.
- Mpumalanga Department of Public works, roads, and infrastructure.
- South African Heritage Resource Agency.
- Mpumalanga Heritage Resources Agency.
- South African Civil Aviation Authority (SACAA).
- South African National Parks (SANParks)
- South African National Biodiversity Institute (SANBI).
- South African National Defence Force.
- Surrounding landowners.
- Environmental Groups and Non-Governmental Organisations (NGOs).

#### **9.1.2 PUBLIC PARTICIPATION DATABASE**

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 326, the public participation practitioner must keep a register of I&APs. A register will be compiled to fulfill this requirement, and details of I&APs, including their comments, will be updated throughout the project cycle.

#### **9.1.3 SITE NOTICES**

The A2-size notices will be fixed at conspicuous locations within and around the proposed development area. The details of where the notices were placed will be provided in the Final BAR. The notices will be in English and one other local language.

#### **9.1.4 PLACEMENT OF ADVERTISEMENT IN THE LOCAL NEWSPAPER**

An English newspaper advertisement will be placed in the local newspaper. The advertisement aims to inform further the I&APs of the proposed activities and the availability of draft reports for review and comments. Thirty (30) days will be allowed for the public to submit their comments, issues, and concerns.

#### **9.1.5 PLACEMENT OF DRAFT BASIC ASSESSMENT REPORT FOR COMMENTS**

The draft Basic Assessment Report will be released for review and comments by interested and affected parties and identified stakeholders. Proof of submission of the draft BAR to all stakeholders, all comments received from stakeholders, and the Comments and Response Report (CRR) will be attached to the final BAR for submission to the

DFFE.

#### **9.1.6 PUBLIC MEETINGS**

Given the proposed site's distance from communities, no meetings are planned. However, focus group meetings will be arranged accordingly.

### **10 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE, AND CULTURAL ASPECTS**

This section outlines parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description and knowledge of the existing environment, potential interactions between the project and the environment are identified below. The project's possible effects on the human environment, socio-economic conditions, and physical and cultural resources are included.

#### **10.1 SOCIO-ECONOMIC DESCRIPTION**

This section presents the socio-economic aspects focusing on the Province and Municipalities within the proposed study area.

##### **10.1.1 PROVINCIAL DESCRIPTION OF THE PROPOSED PROJECT**

Mpumalanga Province is in the eastern part of South Africa, covering almost 76,495 km<sup>2</sup> of diverse landscape, with a population of approximately 4,679,786. Mpumalanga is predominantly a mountainous province. It includes the eastern spur of the Drakensberg, rising to more than 7,500 feet (2,300 m) in the northeast, and descends westward from the great interior plateau (Highveld) of southern Africa to form a relatively narrow Lowveld plain along the border with Mozambique and Swaziland.

The province has three district municipalities: Ehlanzeni District, Gert Sibande District, and Nkangala District. These districts are further subdivided into 17 local municipalities. The proposed development is in Dr Pixley Ka Seme Local Municipality. The capital city of Mpumalanga is Nelspruit, while other major cities and towns include Witbank, Middelburg, Secunda, and Ermelo.

##### **10.1.2 DISTRICT MUNICIPALITY WITHIN WHICH THE STUDY AREA IS LOCATED**

The Gert Sibande District Municipality is a Category C Municipality Mpumalanga Province. It borders Ehlanzeni and Nkangala District Municipalities to the north, South African provinces such as KwaZulu-Natal and Free State provinces

to the south, and Gauteng province to the west ([www.odm.org.za](http://www.odm.org.za)). It also borders with other countries, such as Swaziland to the east and Mozambique to the west.

According to the IDP (2017), this is the largest district in the Mpumalanga province and is comprised of seven local municipalities: Govan Mbeki, Chief Albert Luthuli, Msukaligwa, Dipaleseng, Mkhondo, Lekwa, and Dr Pixley ka Seme Local Municipality (proposed area of the project).

### **10.1.3 LOCAL MUNICIPALITY WITHIN WHICH THE STUDY AREA IS LOCATED**

#### **10.1.3.1 PIXLEY KA SEME LOCAL MUNICIPALITY**

The Pixley Ka Seme Local Municipality is a Category B municipality situated within the Gert Sibande District in the Mpumalanga Province. It is bordered by Msukaligwa in the north, the Free State and KwaZulu-Natal Provinces in the south, Mkhondo in the east, and Lekwa in the west. It is one of the seven municipalities comprising the district, accounting for 16% of its geographical area. The municipality is named after Pixley Ka Seme, a founder and president of the African National Congress. Volksrust is the seat of the municipality. The Municipality covers an area of 5 227km<sup>2</sup>. The municipality has four towns: Amersfoort, Perdekop, Volksrust, and Wakkerstroom (<https://www.statssa.gov.za>).

The main Economic Sectors within this Municipality are Agriculture (20%), trade (19.9%), community services (16.4%), construction (12.1%), finance (5.9%), manufacturing (4.6%), transport (4.4%), utilities (3.8%), and mining (2.2%) ([www.municipalities.co.za](http://www.municipalities.co.za)).



Figure 8: Dr. Pixley Ka Seme Local Municipality ([www.municipalities.co.za](http://www.municipalities.co.za))

#### 10.1.4 CLIMATIC CONDITION OF THE PROPOSED AREA

The Majuba Power Station lies within quaternary sub-catchment C11J of rainfall zone C1B. The Majuba Power Station area is characterized by moderate summer rainfall, and according to the Köppen Classification, the area's climate is defined as temperate to warm temperature with summer rainfall. The climate in the study area can be described as typical highveld conditions with moderate and wet summers, while winters are cold and dry. Severe frost and snow are sometimes experienced. The area also falls within the mist belt. The winds in the region are usually north-westerly and reach maximum speeds in the afternoon. During thunderstorms, strong and gusty south-westerly winds are common but short in duration for these wind periods. During prolonged droughts, dust storms may be frequent. Local thunderstorms and showers are responsible for most of the precipitation during the summer. Hail and lightning are sometimes associated with thunderstorms, mainly from October to December and March. Fog occurs frequently throughout the year. The winds in the region are usually north-westerly and reach their maximum speed in the afternoon.



Gert Sibande District, located in the southeastern part of Mpumalanga Province, experiences a subtropical highland climate characterized by distinct seasonal variations. Summers, spanning from October to March, are warm to hot, with average daytime temperatures ranging from 20°C to 30°C (68°F to 86°F) and occasionally exceeding 35°C (95°F) in some areas. Winters, from April to September, are mild to cool, with daytime temperatures averaging between 5°C and 20°C (41°F to 68°F). Night temperatures can drop significantly, sometimes approaching freezing, especially in higher elevations.

The district receives most of its rainfall during the summer months, with precipitation peaking between October and March. Annual rainfall varies considerably across the district, ranging from approximately 600 mm to 1,200 mm, with higher rainfall generally observed in the eastern parts near the escarpment. Due to increased precipitation and temperatures, humidity levels are higher in summer, while winters are usually drier with lower humidity.

Wind patterns in the district can vary, with occasional strong winds, particularly during the transitional seasons of spring and autumn. Frost can occur during the winter months, especially in higher elevation areas, and while snowfall is rare, it is possible in the higher elevations near the Drakensberg mountains. The diverse topography of Gert Sibande District, ranging from highveld plateaus to lowveld plains, significantly influences its climatic conditions, contributing to the variety in temperature and precipitation patterns across the region (<https://www.sahistory.org.za/place/driefontein-mpumalanga>).

#### 10.1.5 GEOLOGY

The study area is situated on the northeastern edge of the Great Karoo Basin, which primarily consists of sediments from the Karoo Supergroup, dating from the Carboniferous to early Jurassic periods. These sediments have been intruded by Karoo dolerite along planes of weakness, significantly contributing to the region's geological structure. The study area is located within the central-eastern part of the central Karoo Basin and is primarily underlain by the Permian Ecca Group, particularly the Vryheid and Volksrust Formations. In this region, only the rocks of the Volksrust Formation are exposed. These rocks have been extensively intruded by dolerite sills and dykes during the Jurassic period, in association with the emplacement of the Drakensberg Mountains.

The geology of the area includes well-lithified (hard) rocks with little primary porosity. The Vryheid Formation outcrops 8 km north of the power station, with both formations grading into each other and deposited on the Ventersdorp basement. The region's geology also features extensive intrusions of Jurassic dolerite from the Karoo Igneous Province, forming a network of dykes, sills, and sheets. These dolerites, comprising dark-colored, crystalline basaltic rocks, are found north and south of the power station and likely underlie it in some areas. Although no significant quaternary or unconsolidated deposits are mapped near the power station, small sand, alluvium, or colluvium deposits are expected near larger rivers or stream courses in the broader study area.

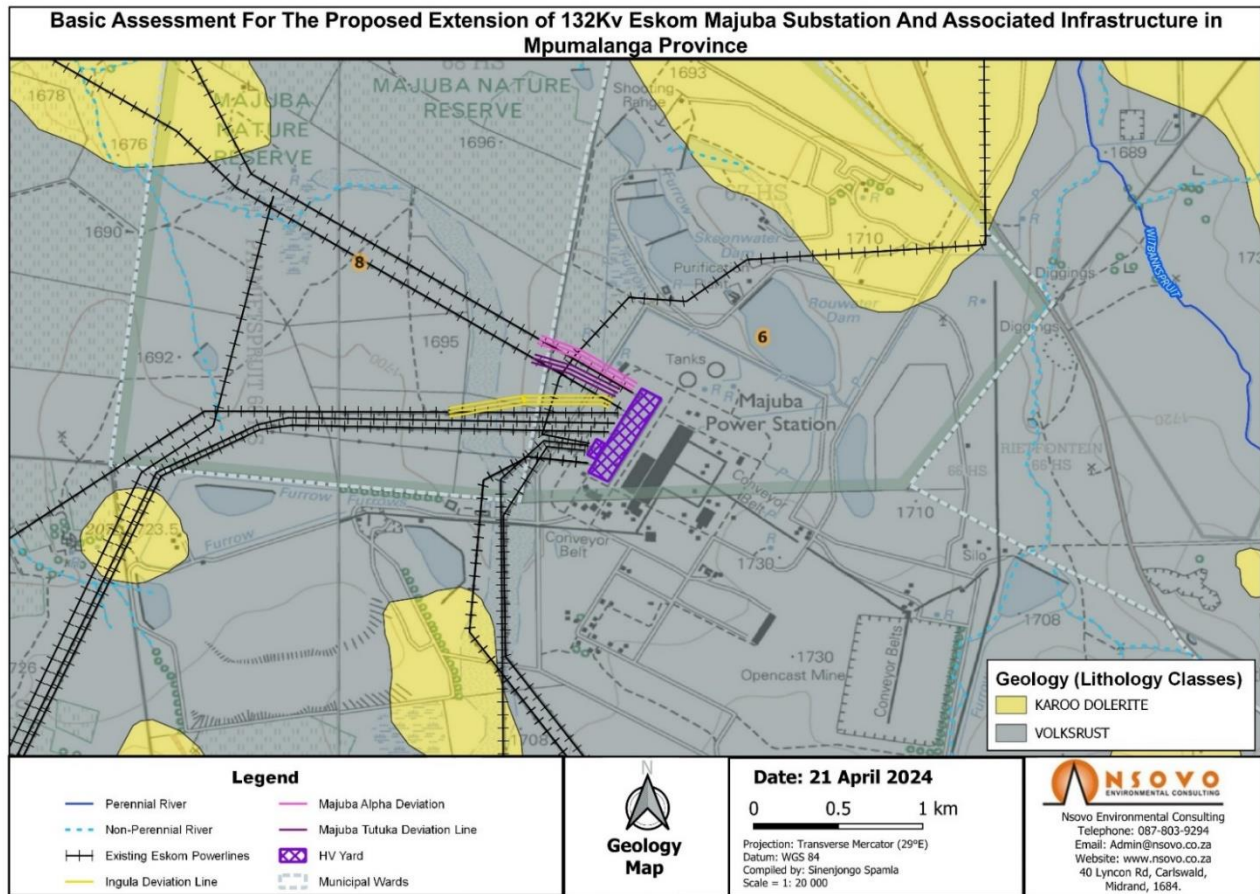


Figure 9: Geology Map

### 10.1.6 TOPOGRAPHY OF THE STUDY AREA

The Majuba Power Station is characterized by a predominantly flat to gently rolling terrain. This landscape is typical of the Highveld region, known for its extensive, open plains. The area around the power station has an average elevation of approximately 1,600 meters (5,250 feet) above sea level, contributing to the local climate and vegetation patterns. Grasslands dominate the vegetation in the vicinity, supporting both agriculture and livestock farming. The region features a few water bodies and small rivers, which play a role in the local hydrology and serve the operational needs of the power station. The area is also well-developed with infrastructure, including roads, railways, and transmission lines that connect Majuba Power Station to the national grid, facilitating the transportation of coal and other materials required for power generation.

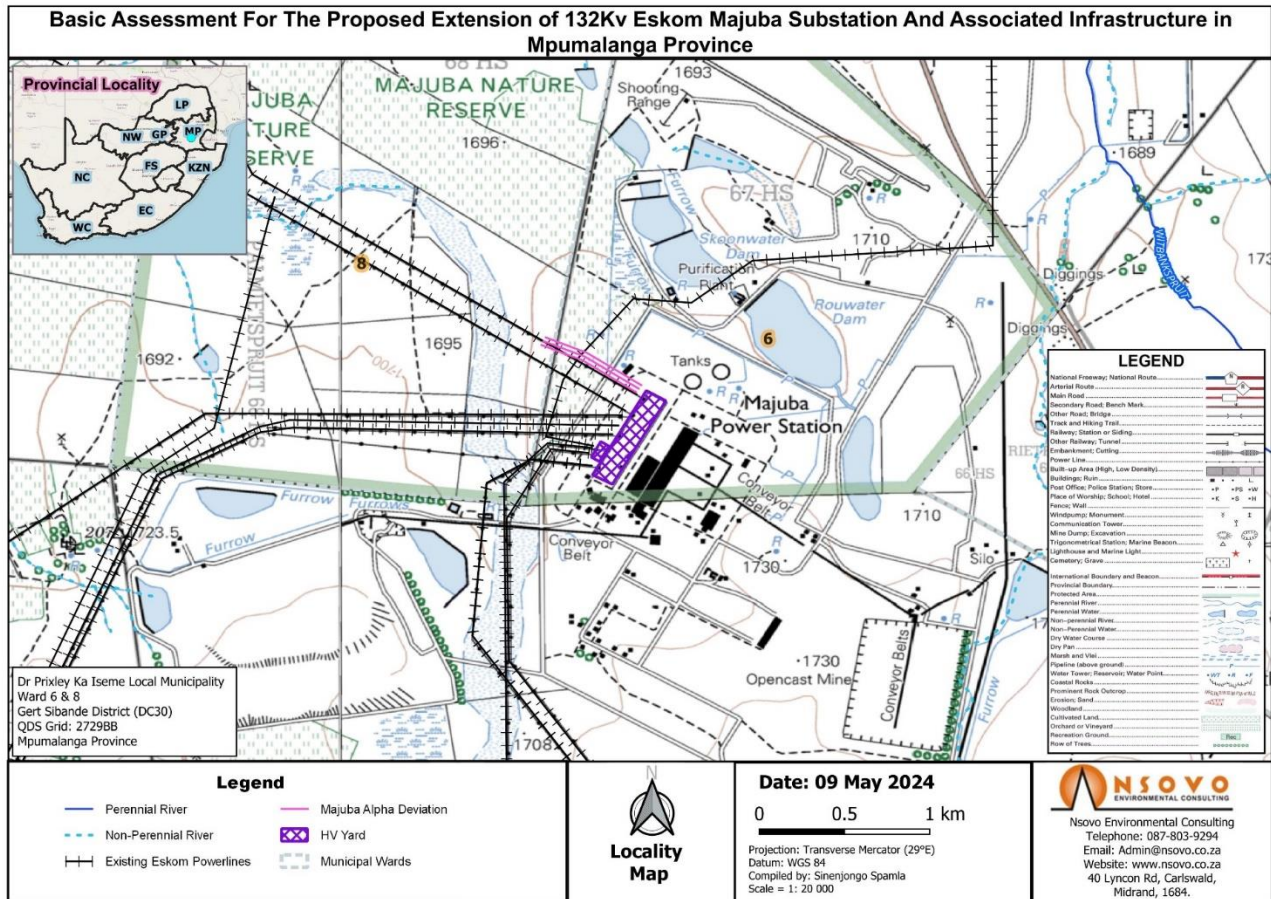


Figure 10: Topography Locality Map

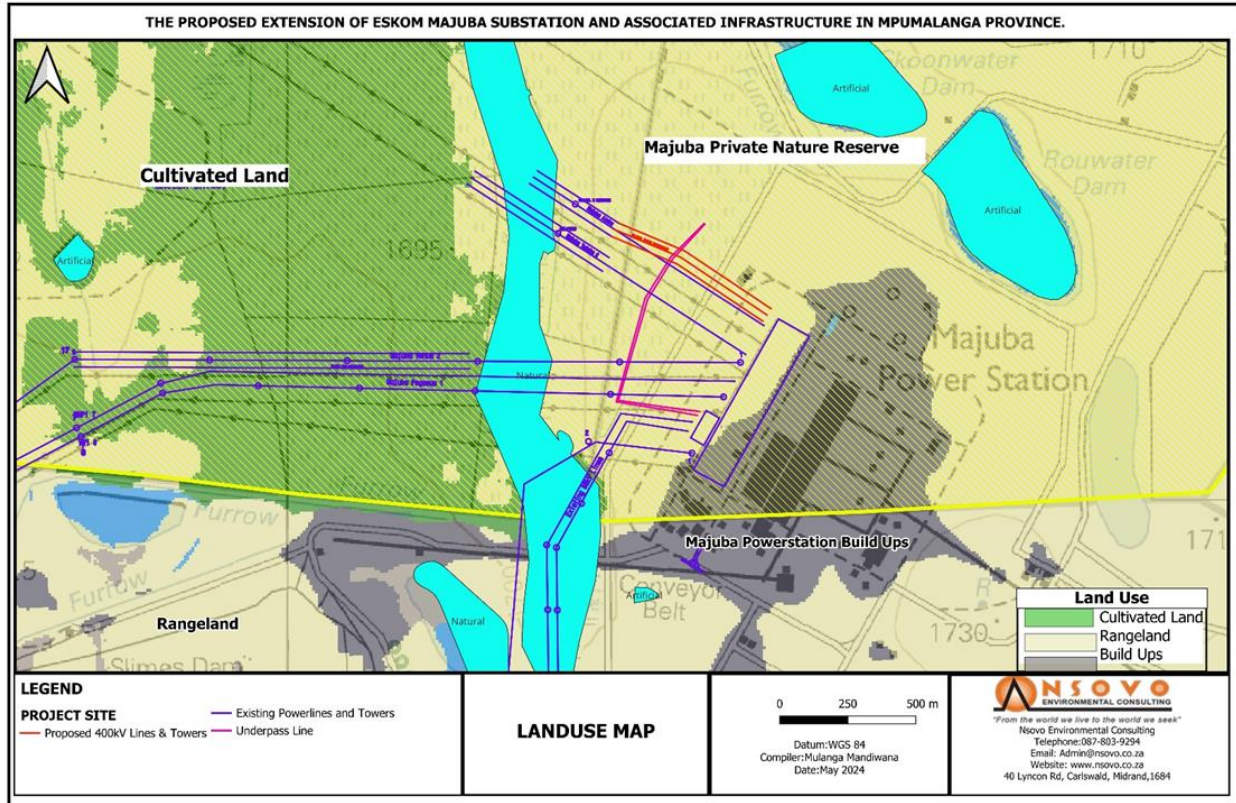


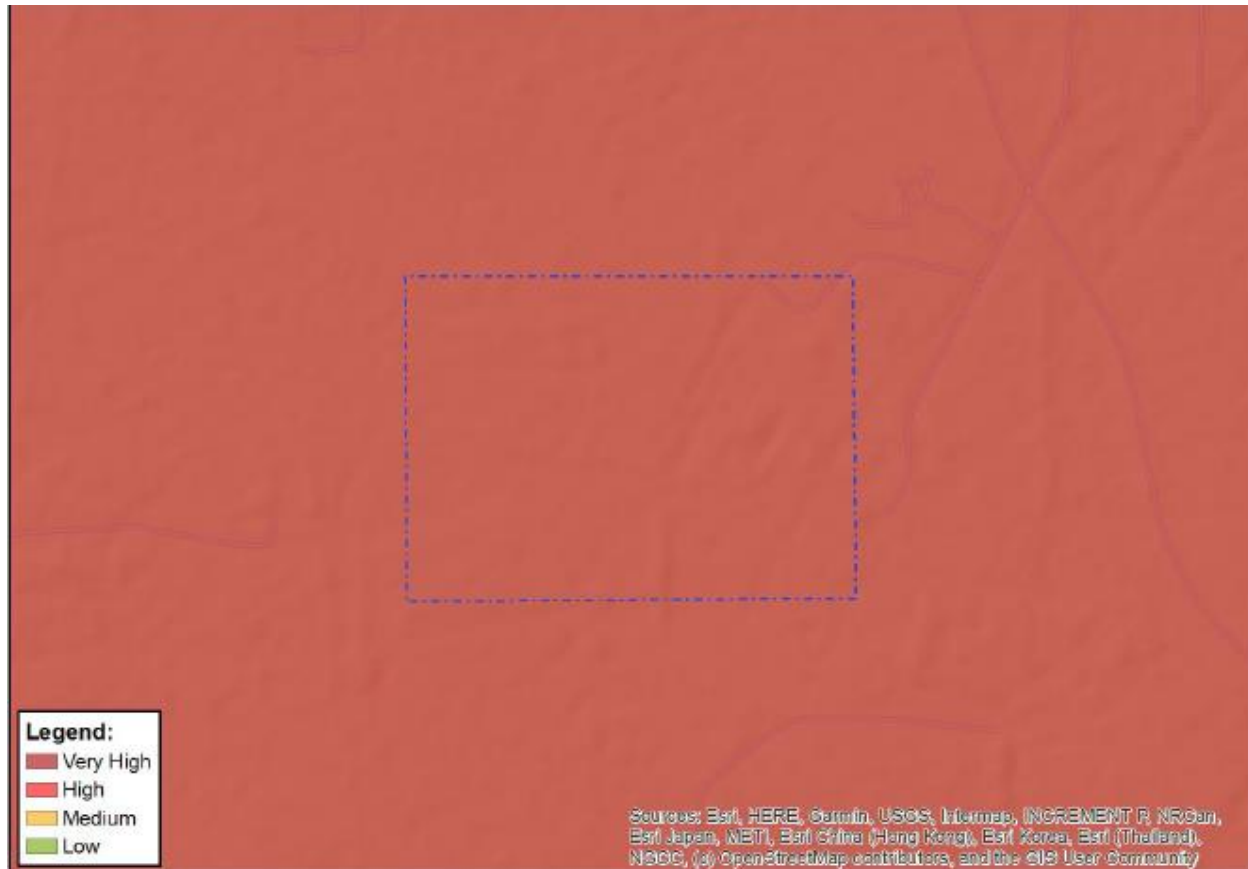
Figure 11: Figure 9: Majuba Land Use Map.

### 10.1.7 SURFACE WATER WITHIN THE AREA

The project area is located entirely within the quaternary catchment C11J of the Upper Vaal Water Management Area (WMA). All watercourses from this area flow into the Geelklip Spruit River, which then joins the Vaal River. This region falls within the Upper Vaal River Primary Drainage Region and encompasses the upper reaches of the Geelklip Spruit. The Geelklip Spruit runs past the eastern side of the Majuba Power Station (PS), with proposed new dams and extensions situated to its west. The area includes both perennial and ephemeral watercourses within the vicinity of Majuba PS (GHT, 2017b).

The Majuba Power Station and its ashing area can be divided into secondary drainage regions with smaller catchment areas and streams. The topography of the region is characteristic of the Mpumalanga Highveld, featuring gently undulating plateaus. Local stream flood plains are between 1,700 and 1,720 meters above mean sea level (mamsl). Surface drainage from the Ashing Area flows north, east, and west, entering the Mezig or Palmiet Spruits. The Power Station area has surface drainage to the north and east, directing water into the Geelklip and Witbank Spruits, respectively.

Most wetlands throughout the study area have been categorised as being in a near natural state, Present Ecological State (PES) of A/B. The non-perennial watercourse draining to the west of the ADF is classified as a seep wetland with a PES of A/B (Majuba Power Station Groundwater Specialist Report, 2019).



**Figure 12: Screening Tool Aquatic Sensitivity**

According to the specialist findings, the proposed project is anticipated to impact surface water primarily through its effects on wetland health and functionality within the study area. Specifically, the unchanneled valley bottom wetland (HGM 1) identified in the catchment area is crucial for biodiversity and ecosystem services, influencing local and downstream habitat quality. Despite moderate historical impacts on water inputs and distribution patterns affecting wetland health, the wetlands are recognized for their high ecological sensitivity and importance. They contribute significantly to maintaining water quality and quantity downstream, serving as critical habitats and movement corridors for wetland species.

Potential impacts during the construction and operational phases include sedimentation, invasive alien vegetation encroachment, loss of wetland functions, and alterations to natural flow regimes. However, mitigation strategies proposed for the project aim to address these concerns effectively. Notably, the relocation and realignment of existing

Eskom infrastructure, primarily situated more than 200 meters from HGM 1 and within modified terrestrial grasslands, are designed to minimize direct impacts on significant wetland areas. The presence of temporary artificial wetland habitats with high basal cover in the development zone further supports mitigation efforts by offering protective buffers for the natural wetland ecosystems.

According to the Department of Water and Sanitation (DWS) Risk Assessment Matrix, which evaluated impacts on water quality, hydrology, geomorphology, habitat, and biota within 500 meters of the proposed development, the overall risk is deemed low. This assessment considers factors such as severity, spatial scale, duration, and frequency of potential impacts. The low-risk determination hinges on the implementation of comprehensive mitigation measures outlined in the project plan. Consequently, with proper management practices in place, the project is expected to have minimal adverse effects on surface water resources throughout its construction and operational phases.

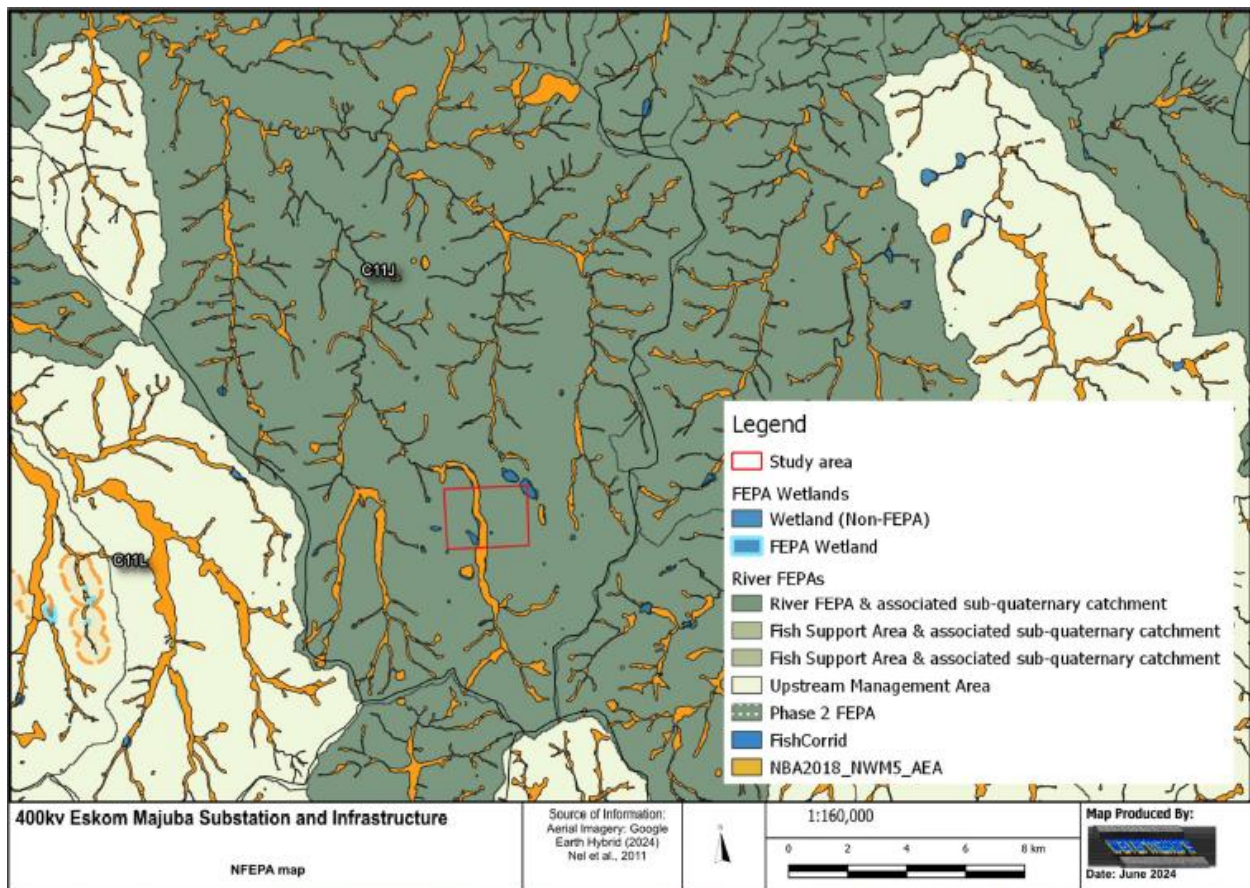


Figure 13: NFEPA map indicating the closest FEPA features in relation to the study area (WaterMakers, 2024)

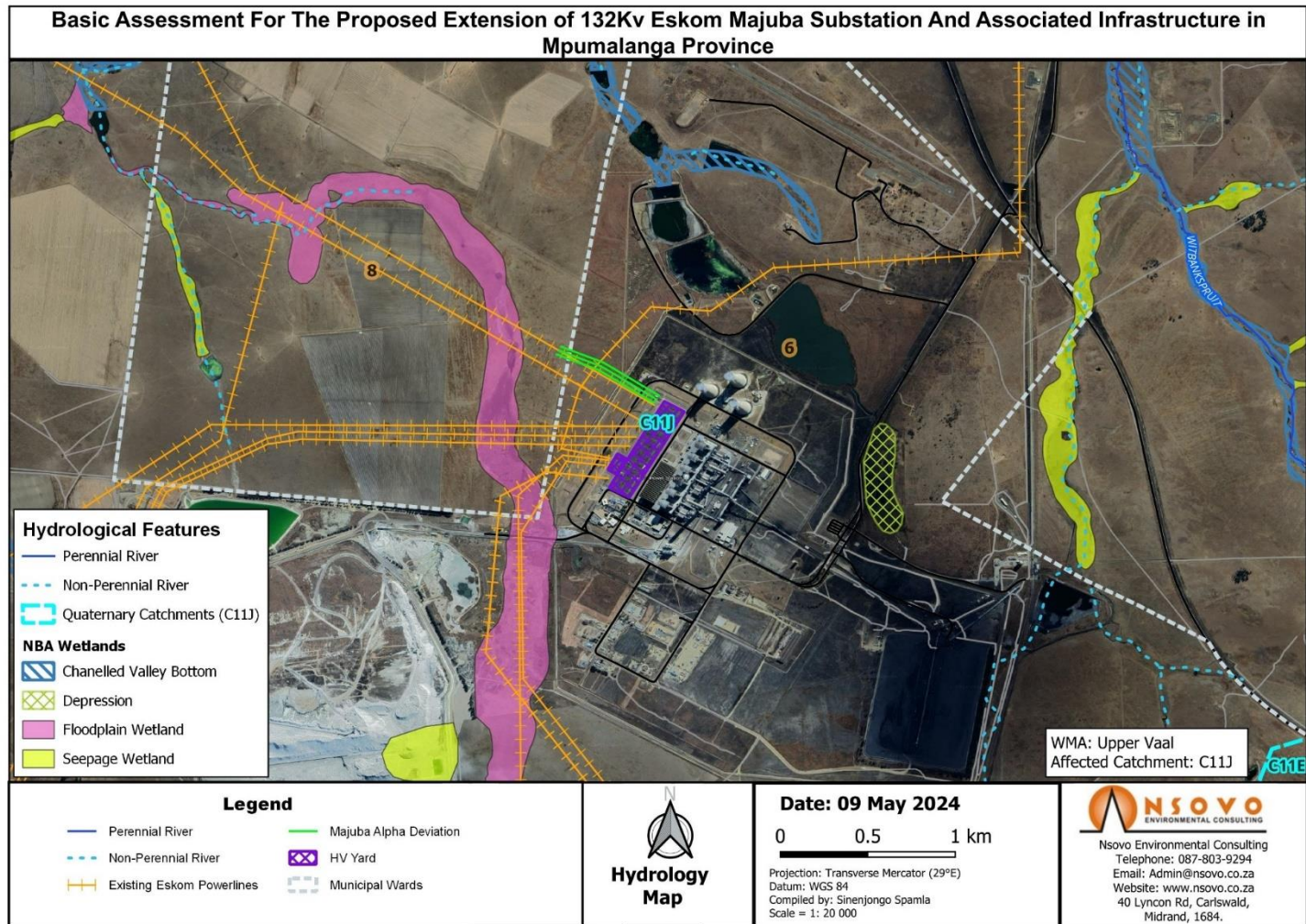


Figure 14: Hydrological map of the proposed location.

Table 10: Screening Tool Vs. Specialist Site Sensitivity Verification Outcomes

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
Screening Tool	Site Sensitivity Verification		

The specialist report is attached in **Appendix C-1**.

### 10.1.8 AGRICULTURE

The site consists of Witbank soil that is usually disturbed by anthropogenic influences such as intentional transportation and severe physical disturbance for urban development (industrial use in this case). The area where the proposed development is to take place was previously excavated and backfilled with soil mixed with firmer material. The diagnostic horizons are no longer arranged in any discernible order or recognisable horization as expected in natural soil, sometimes rendering them unsuitable for any cultivation.

Based on the observations by Setsipane, 2024, during the site assessment, the dominant soils occurring within the study area are of the Witbank formation. Most of the soils occurring within the study area do not meet the conditions for agricultural suitability to a certain extent, and these conditions include:

- Adequate depth (greater than 60 cm) to accommodate root development for the majority of cultivated crops;
- Good structure, as in water-stable aggregates, which allows for root penetration and water retention;
- Sufficient distribution of high-quality and potential soils within the study area to constitute a viable economic management unit; and
- Good climatic conditions, such as sufficient rainfall and sunlight, increase crop variety.

The development footprint areas are in an industrialised area wherein electricity generation occurs. No active agricultural practice is taking place in the study area's immediate vicinity. The area is characterised by previously excavated and backfilled areas mixed with firm material.

The screening tool analysis was conducted, which presented the findings as the impact on agricultural resources being of high sensitivity in terms of agricultural potential. Based on the outcomes of the field assessment, this was found to have a less significant impact as presented on the screening tool due to the dominant soil forms that are not high-potential agricultural soils due to anthropogenic impacts. The development's only possible impact was minimal soil and land degradation because of land disturbance during construction and decommissioning. However, integrated mitigation measures must be implemented accordingly to minimise the potential loss of these valuable soils,



considering the need for sustainable development and increased electricity generation and transmission capacity. Figure 15 below is the Screening Tool Agricultural Sensitivity.

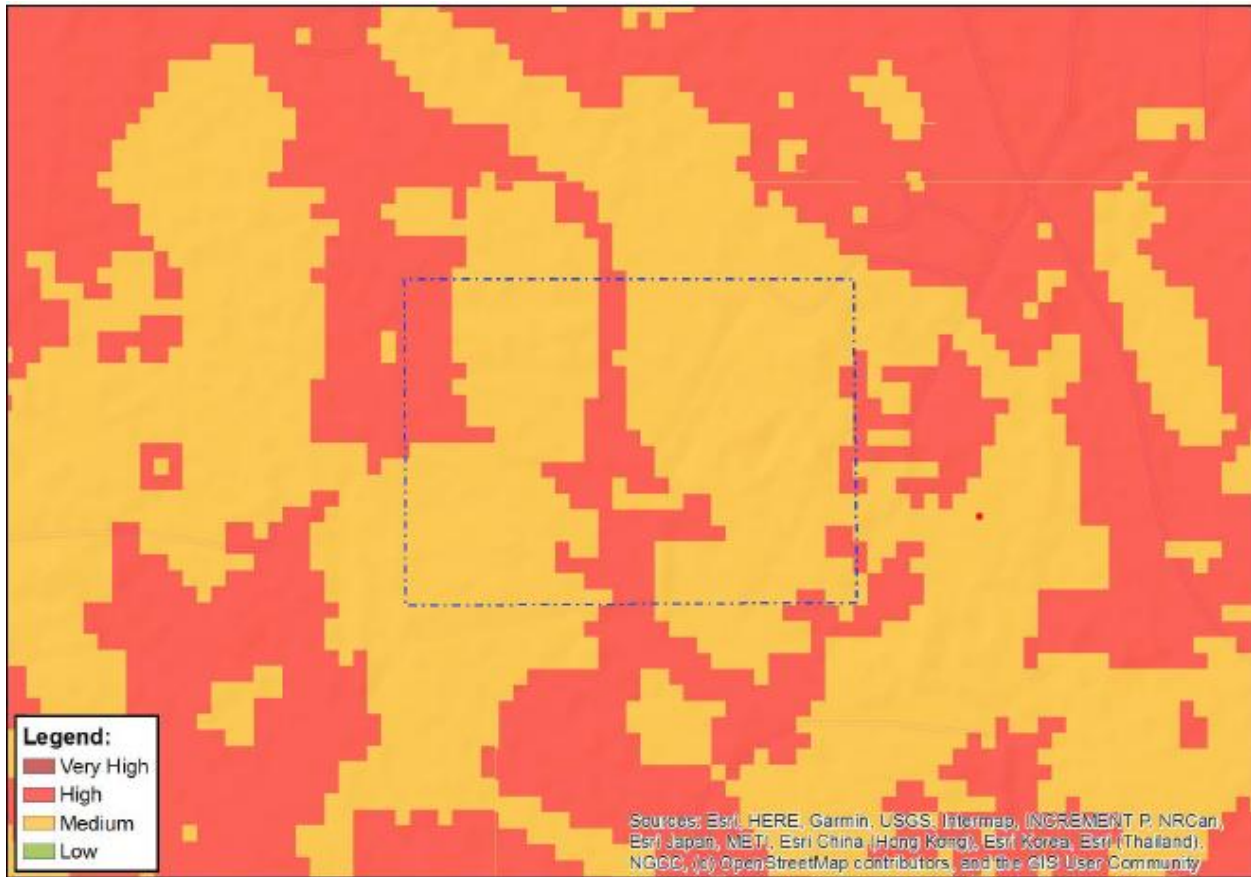


Figure 15: Screening Tool Agricultural Sensitivity

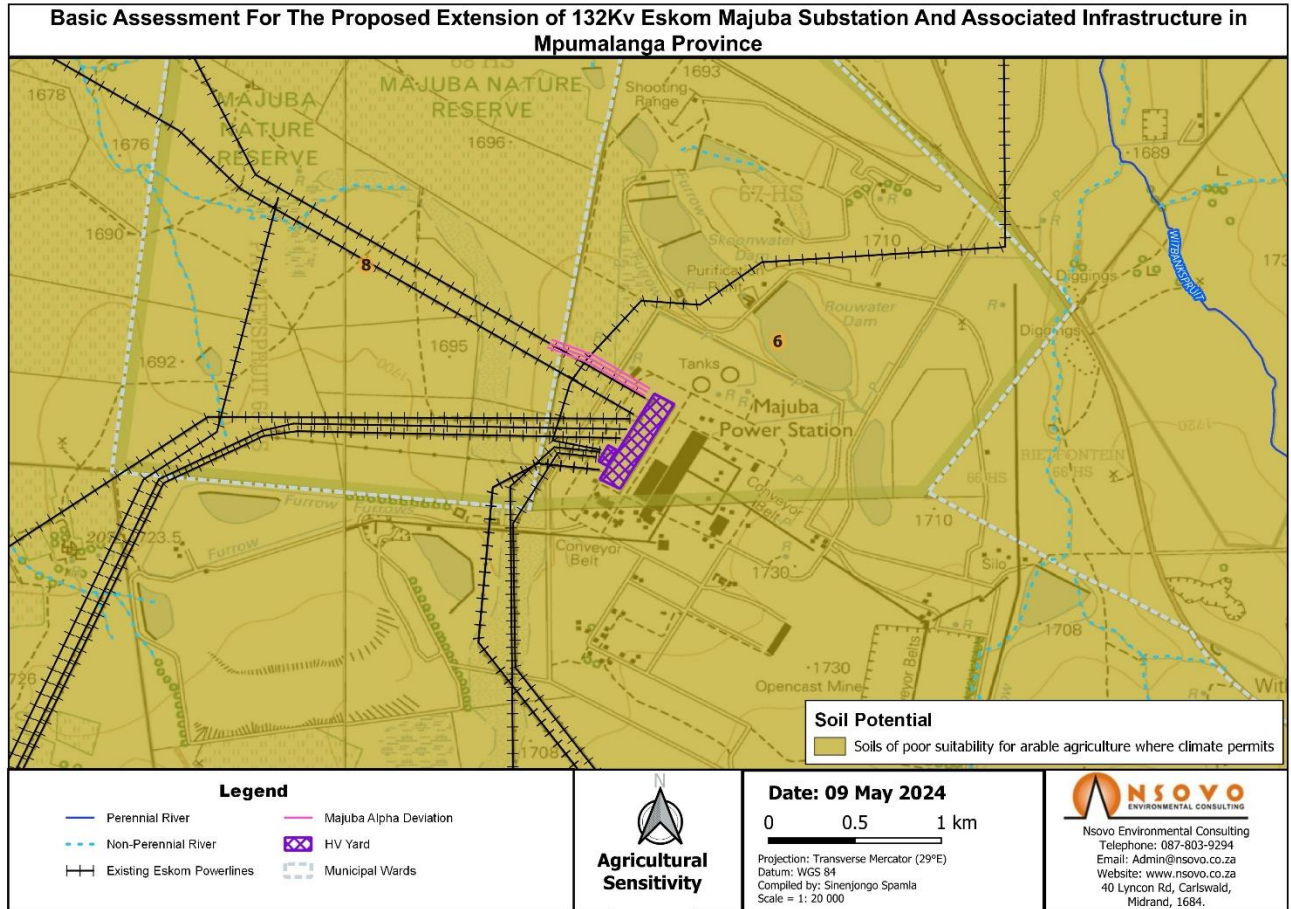


Figure 16: Agricultural Sensitivity Map



Figure 17: Agricultural potential of soils within the study area

Table 11: Screening Tool Vs Specialist Site Sensitivity Verification Outcomes

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	Screening Tool		Site Sensitivity Verification Outcomes

The Agriculture Site Sensitivity Verification Report is attached in **Appendix C-3**.

### 10.1.9 CIVIL AVIATION

The Screening Tool identified the area as highly sensitive to aviation. This is due to the Amersfoort Aerodrome, approximately 12km from the study area.

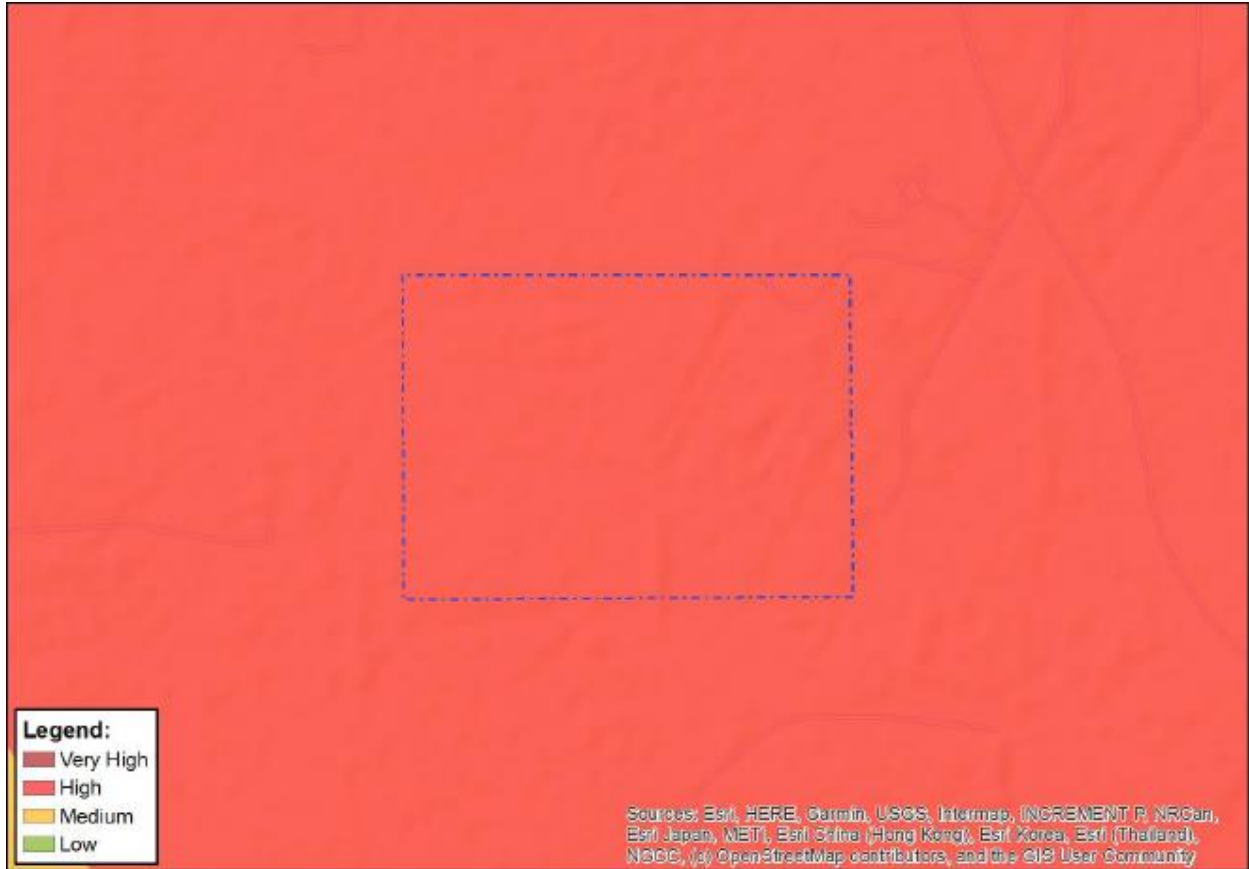


Figure 18: Screening Tool Civil Aviation Sensitivity

Table 12: CAA Screening Tool vs. Site Sensitivity Verification Outcomes

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	Screening Tool		Site Sensitivity Verification Outcomes

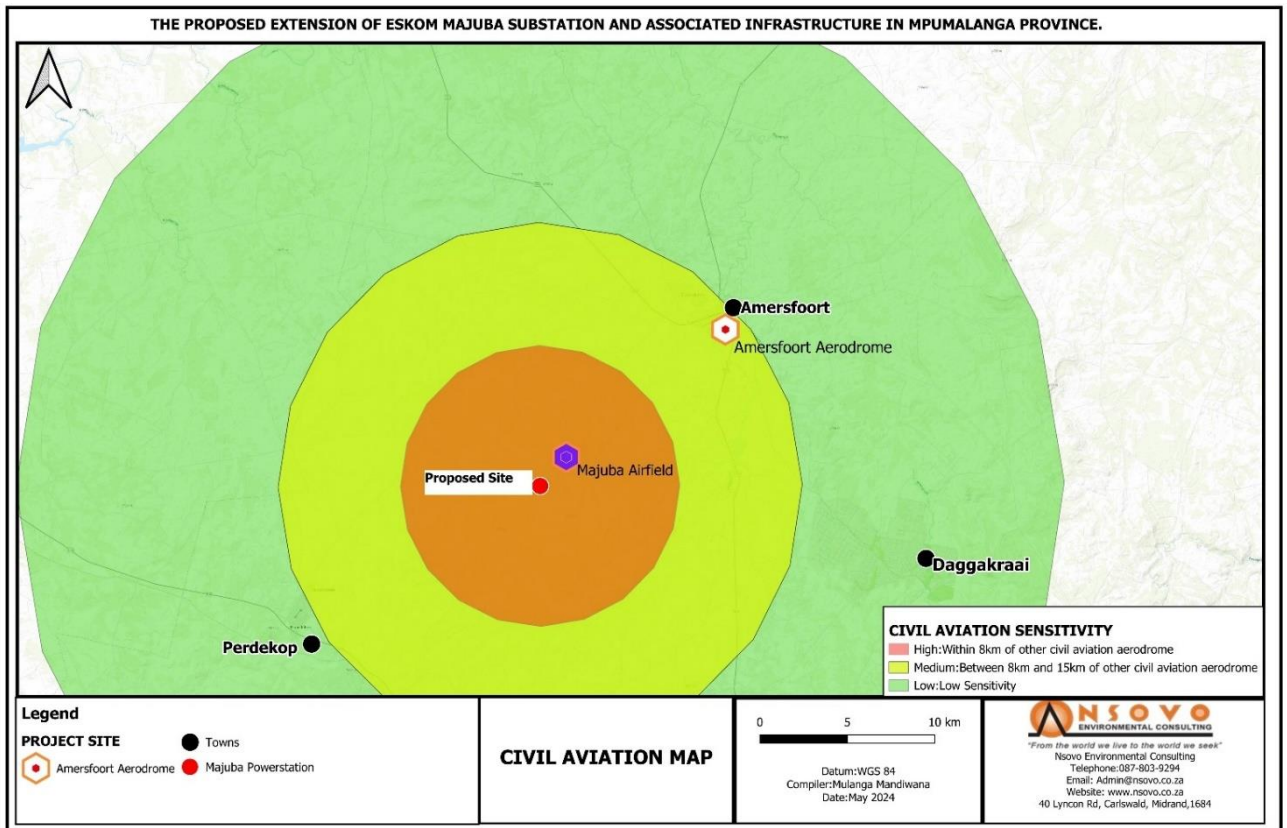


Figure 19: Civil Aviation Map

### 10.1.10 DEFENCE

The screening tool assessed the proposed site as having low sensitivity to Defence concerns. Therefore, according to protocols for Specialist (GN.320) of March 2020, there are no anticipated adverse impacts on the Defence. Figure 20 shows the screening tool Defence sensitivity.

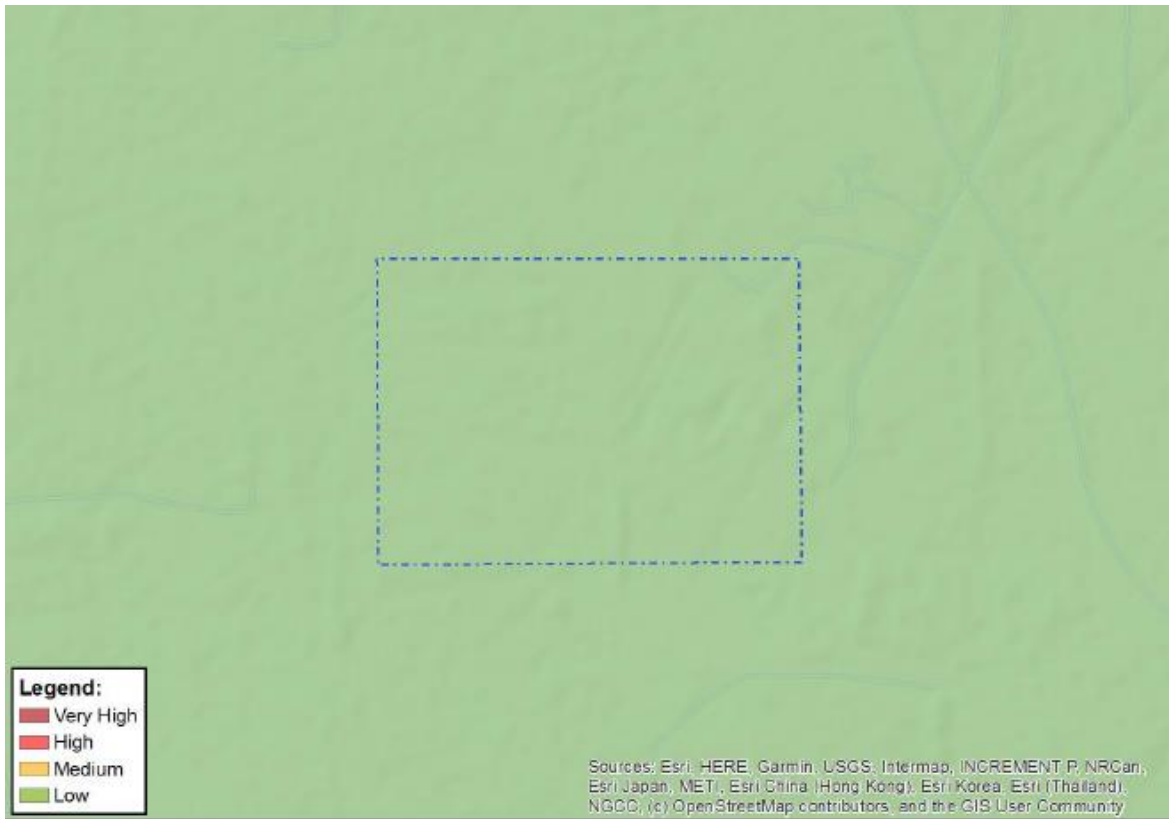


Figure 20: Screening Tool Defense Sensitivity

Table 13: Defence Theme Screening Tool Vs Site Sensitivity Verification Outcomes

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			Screening Tool and Site Sensitivity Verification Outcome

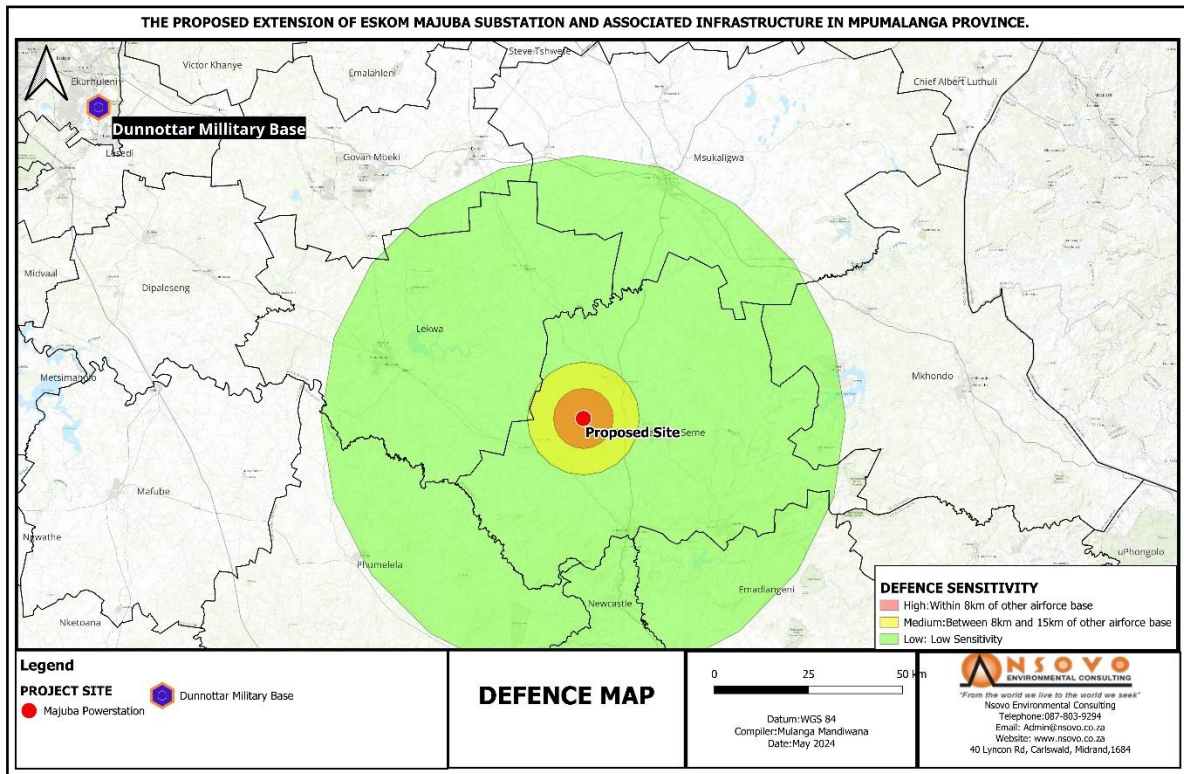


Figure 21: Majuba Defence Map

10.1.11 AIR QUALITY AND POLLUTION

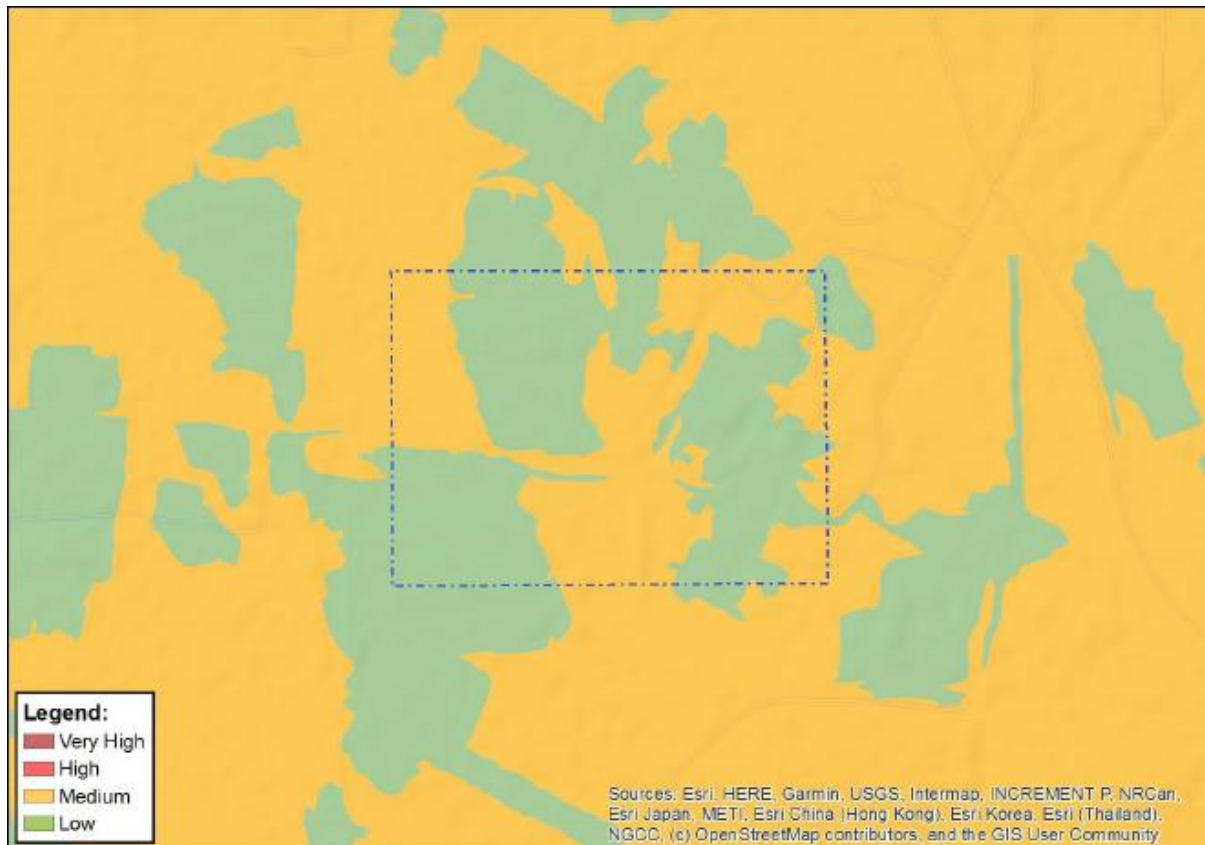
Air quality is defined to include noise and odour and addressing all sources of air pollution (i.e., point, area, and mobile sources). The Mpumalanga Air Quality Management Plan has been developed to comply with the National Environmental Management: Air Quality Act, 39 of 2004, and, more specifically, to guide Air Quality Management in the Gert Sibande District Municipality. The Plan identifies air pollution sources in the proposed locations as follows:

- Brick making;
- Fuel depots;
- Biomass burning;
- Waste burning; and
- Motor vehicles.

10.1.12 VEGETATION STRUCTURE AND COMPOSITION

The project site falls within the Grassland biome and this Biome has a high biodiversity, ranked only below the Fynbos biome in terms of biodiversity in South Africa. This Biome is found mainly on the high central plateau of South Africa, and the inland areas of KwaZulu-Natal Province and the Eastern Cape Province. Grasslands are dominated by a single layer of grass. Trees are absent, except in a few localized habitats, and geophytes are often abundant. The project site falls within the Amersfoort Highveld Clay Grassland vegetation type, listed as Vulnerable. No remnants of this vegetation type still exist within the Power Station, but only within the Nature Reserve.

The clearing of natural vegetation and stripping topsoil and sub-soils for placing pylons will potentially result in increased sediment runoff from the site into watercourses associated with the study area. Considering the nature of the operation to be undertaken and the proposed work procedure, the proposed impact will likely not be significant. However, care must be taken where the existing access road is widened; it is cardinal that low gradient speedbumps/berms with associated run-off swales be installed to prevent the road from becoming a preferential pathway for surface run-off. Few berms and swales will be necessary where a road follows the contour; the more the road aligns perpendicular to the contours, the more berms would have to be installed.



**Figure 22: Screening Tool Plant Species Sensitivity**

According to Mboneni (2024), the anthropogenic activities taking place within the Majuba Power Station include the existing ash disposal facilities, existing cooling towers and pollution control dams, and associated infrastructure such as internal roads and buildings. The Expansion of the 400kV Eskom Majuba is within the Majuba power station site, whereas the proposed Development of the New 132kV is mostly outside the Power station site. Therefore, limited natural vegetation remains inside the Power station and is dominated by alien invasive plant species and weeds. However, natural vegetation still exists outside of the Power station, especially within the Majuba Nature Reserve. During the field survey, no threatened plant species protected trees or provincial protected plants were observed within the study area. However, should any plant species of conservation concern be found during construction activities, a search and rescue plan should be developed, and a suitable habitat for translocation should exist within the Nature Reserve.



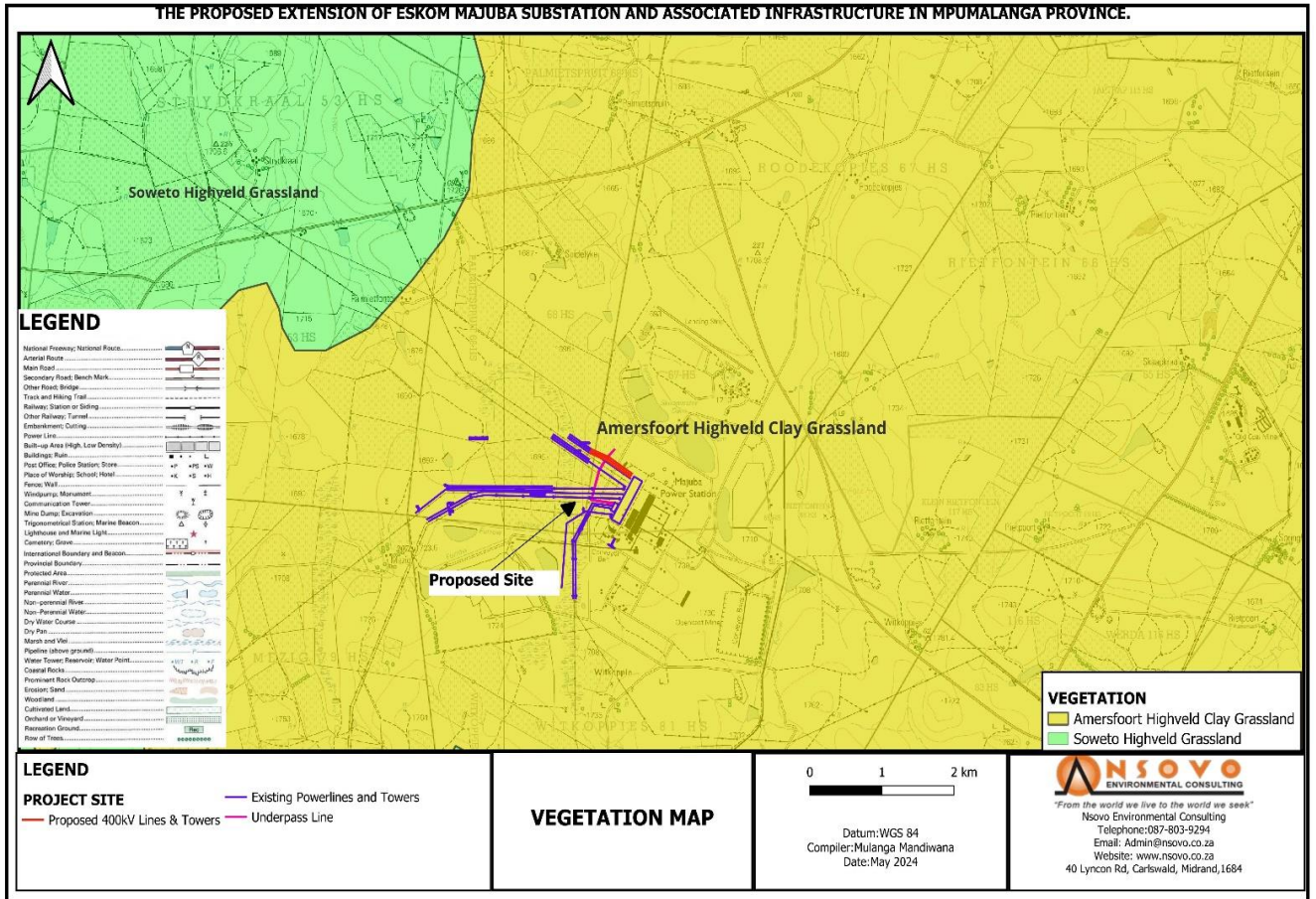


Figure 23: Vegetation Map

Table 14: Terrestrial Biodiversity Theme Screening Tool Vs SSV Outcomes

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
		Screening Tool	Site Sensitivity Verification Outcome

The Biodiversity Report is attached in **Appendix C-2**.

### 10.1.13 FAUNA

Six mammal species were observed within the project area, all of which were seen within the Majuba Nature Reserve. No mammal Species of Conservation Concern (SCC) was recorded during the survey. Continual habitat destruction, alteration, and human disturbances have resulted in the disappearance of sensitive or secretive mammal species in the Reserve (Mboneni, 2024)

The project route is situated in a heavily modified and within natural vegetation (Majuba Nature Reserve), and only three micro-habitats are found on or near the project site, namely a watercourse, grasslands, and exotic trees.

- **Wetlands** are of particular importance for birds in the study area, as the area is largely urbanized; however, these are very degraded. Water bodies represent sensitive areas because they provide habitat for a wide variety of terrestrial and aquatic species, particularly avifauna. Bird species such as herons, bishops, weavers, cisticolas, and warblers will breed in the reeds growing on the banks of the dams/pans and feed on insects living within the reeds. Many of these bird species make use of the thorny nature of these trees to build their nests. The open grassy/weedy river bed is rather frequently visited for very short periods of time by mainly granivorous passerines (Cape Sparrow, Speckled pigeon, Blue waxbill, Laughing Dove, etc.) in search of prey attracted to moisture and flowering herbs and weeds. The rivers are particularly important for stork species such as the Black Stork, Yellow-billed Stork, and various other waterbirds.
- **Open grasslands:** Open grasslands on site represent a significant feeding area for many bird species. The grassland patches are also a favourite foraging area for game birds such as francolins, Helmeted Guineafowl, Black-shouldered Kite, etc. This, in turn, may attract raptors because of both the presence and accessibility of prey. Red Data Listed bird species, such as Lanner Falcon, Lesser Kestrel, and Martial Eagle, may often hunt in open grassland areas.
- **Exotic trees** often provide roosting and nesting habitat for various bird species, and as such their importance for avifauna should not be underestimated. Exotic trees provide perching, roosting, and nesting habitat for various raptor species and larger birds such as francolins, Guineafowl, Herons, and Haded ibises. Although the stands of *Eucalyptus* spp are invader species, these stands have become important refuges for certain species of raptors, including Eagles and Buzzards. Birds such as Lesser Kestrel and Falcons make use of large *Eucalyptus* trees, where they roost in large numbers. Nests identified in the study area should not be unnecessarily destroyed. Forty (40) bird species were recorded during the field survey. Species recorded were common, widespread, and typical of the grassland biome. No Red Data bird species associated with the study area were recorded.

The trees, watercourses, and grasslands provide suitable habitats for reptile species to occur within the project site. The survey recorded two reptile species: Speckled Rock Skink (*Trachylepis punctatissima*) and Cape Skink (*Trachylepis capensis*). No reptile Species of Conservation Concern were recorded on the project development site. According to the anecdotal information, the following reptile species have been sighted in the area, namely Peter's Thread Snake (*Leptotyphlops scutifrons*), Rhombic skaapsteker (*Psammophylax rhombeatus*), Mole Snake (*Pseudaspis cana*) and Rinkhals (*Hemachatus haemachatus*). Most reptile species are sensitive to severe habitat alteration and fragmentation. Species are also very often "expelled" into riparian zones due to the transformation of lands for anthropogenic disturbances such as human settlements and agricultural purposes.

Giant girdled lizard (*Smaug giganteus*), formerly known as *Cordylus giganteus*, is found in Highveld grassland and inhabits flat or sloping Highveld grasslands. They live in self-excavated burrows, although they can be opportunistic and inhabit empty burrows. The Majuba Power Station Nature Reserve, which section of the

proposed development traverses, was declared for the protection of this reptile species. Therefore, to protect this species, training of construction personnel to recognize Giant girdled lizard species will reduce the probability of this species being harmed unnecessarily, and the contractor must ensure that this species is not disturbed, trapped, hunted, or killed during the pre-and construction phases. Sungazers are unique within their family (Cordylidae) in that they rely on self-constructed burrows in specific microhabitats within the grassland matrix as long-term, often permanent, shelter and refuge sites. If any individuals or burrows of *Smaug giganteus* are observed, they must be recorded, and the ECO is immediately notified. Search and Rescue operations should occur before the construction works begin to ensure that any slow-moving or burrowing species (such as moles, chameleons, snakes, or tortoises) would be moved to adjacent suitable habitats by a qualified Faunal Specialist.

The watercourses within the study area hold water on a temporary basis and are important breeding habitats for most of the frog species that could occur within the study area. During the field survey, two frog species were recorded along the project area, namely Raucoust Toad (*Sclerophrys capensis*) and Common River Frog (*Amietia delalandii*). No rivers will be traversed by the proposed development. No frog Species of Conservation Concern were recorded within the project site.

With regards to the invertebrates, during the field survey, the following species were recorded within the proposed development site, namely African blue pansy (*Junonia orithya madagascariensis*), African plain Tiger (*Danaus chrysippus orientis*), Pirate (*Catacroptera cloanthe*), Citrus swallowtail (*Papilio demodocus demodocus*), Painted lady (*Vanessa cardui*), Yellow pansy (*Junonia hierta cebrene*), the Meadow white (*Pontia helice helice*) and Garden acraea (*Acraea horta*). No invertebrate Species of Conservation Concern were recorded within the project site.

**Table 15: Flora and Fauna Theme Screening Tool Vs Site Sensitivity Verification Outcomes**

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	Screening tool		Site Sensitivity Verification Outcome

The Faunal theme is included in the Biodiversity Report attached in **Appendix C-2**.

**10.1.14 HERITAGE**

According to Matenga 2024, Majuba Power Station is on the rolling grassy plains between the Vaal River and the Drakensberg Mountains close to Volksrust and Amersfoort. The locality is flat, with a combined wetland zone and watercourse to the west of the power plant. Construction of the power station commenced in September 1983 with a projected time frame of three years to completion. The first unit of the station went into operation in 1996, becoming the first megawatt project to be commissioned after 1994. The sixth unit was completed in 2001. Over

the years, the footprint of the power station has expanded. A continuous dry ash deposit facility is one of the major projects in the recent past and is prominent in the landscape.

From the perspective of heritage significance assessment, the existing power plant itself dates to the recent past, and the surrounding buffer has been used as a temporary stockpile area and for the placement of temporary structures. From an archaeological perspective, no material dating to the Stone Age and Iron can be expected in the original context (Matenga, 2024).

- **Precolonial Heritage**
  - No relics dating to the precolonial period could be expected to be found in an original context.
- **Buildings of Heritage Significance**
  - There are no buildings in the footprint of the project.
- **Burial Grounds**
  - There are no graves or burial grounds in the footprint of the project.

**Table 16: Heritage Theme Screening Tool Vs Site Sensitivity Verification Outcomes**

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
			Screening Tool and Site Sensitivity Verification Outcome

The Heritage SSV is included in **Appendix C-4**.

**10.1.15 PALAEOLOGY**

According to Bamford 2024, The project lies in the central east part of the main Karoo Basin where only the rocks of the Volksrust Formation are exposed. They were intruded extensively by dolerite sills and dykes during the Jurassic, associated with the emplacement of the Drakensberg Mountains.

The Volksrust Formation is the upper part of the Ecca Group and is predominantly argillaceous and the grey to black silty shale with thin, usually bioturbated siltstone or sandstone lenses and beds that occur mostly in the upper and lower boundaries. The very thick and fine-grained sediments represent an open-shelf environment where muds were deposited from suspension within a deep-water environment. It is not known if this was an inland sea or open marine setting but the discovery of the marine bivalve, Megadesmus, (albeit one instance) about 25km west southwest of Newcastle in Volksrust Formation shales, points to a marine influence for at least part of the sequence (Bamford, 2024).

Dolerite is a volcanic (igneous) rock that intrudes through the layers of overlying rocks or sediments, and cools and solidifies. Because of its origin it does not preserve any fossils. The heating effect of the molten dolerite on the material through which it intrudes bakes the rocks, and if any fossils are present they too are baked and destroyed. Zones of baking vary from a few cm to a few meters in thickness.

**Table 17: Palaeontology Theme Screening Tool Vs Site Sensitivity Verification Outcomes**

Very High sensitivity	High sensitivity	Medium sensitivity	Low sensitivity
	Screening Tool		Site Sensitivity Verification Outcomes

The Palaeontology SSV is included in **Appendix C-5**.

**11 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS, INCLUDING CUMULATIVE IMPACTS IDENTIFIED**

This section describes the potential impacts of the proposed development on the receiving environment. Impacts associated with the relevant environmental components within the study area, as identified, have been assessed based on the EAP’s opinion in consideration of the site and previous experience on similar undertakings, as well as consideration of specialist studies undertaken.

**11.1 POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED**

Potential environmental impacts are described in Table 18 below. This is not an exhaustive list but an insight into the potential impacts of the proposed development. It must be noted that more potential impacts may be identified during the conclusion of public participation, and any such impacts will be assessed in more detail.

Table 18: Potential Environmental Impact Identified

Aspect	Impact	Description
Employment	Positive-No mitigation required	This impact will typically be limited to skilled engineers and planning professionals. The proposed substation project will result in minimal opportunities for the skilled local community during construction, which will be positive.
Air Pollution	Neutral	<p>Potential air pollutants will be generated during construction. This may be from the following activities:</p> <ul style="list-style-type: none"> <li>• Dust emanating from site preparation,</li> <li>• Excavations for placing towers and</li> <li>• Exhaust fumes from construction vehicles.</li> </ul>
Terrestrial Biodiversity	Negative	<p>Potential negative impacts on terrestrial biodiversity that may be expected during the construction phase include:</p> <ul style="list-style-type: none"> <li>• Irreversible loss of natural habitat; and</li> <li>• Ecosystem degradation and loss of integrity.</li> </ul>
Visual	Negative	<p>The negative impacts associated with the proposed development include:</p> <ul style="list-style-type: none"> <li>• Negative impact on the visual quality of the landscape due to the presence of foreign elements;</li> <li>• Minimal loss of vegetation cover for road expansion/widening.</li> <li>• Construction camps and lay-down yards may cause unsightly views.</li> </ul> <p>According to the Screening report for an Environmental Authorization as required by the 2014 EIA Regulations the terrestrial biodiversity Theme sensitivity is assigned a Very High Sensitivity due to the presence of Majuba Nature Reserve, CBA 2, ESA: Protected Area buffer, FEPA Sub catchment and National Protected Area Expansion Strategy (NPAES). During the survey, it was concluded that the proposed development site falls within Low (inside the Power Station) to High (within the Nature Reserve) categories in terms of ecological sensitivity. However, the proposed</p>

Aspect	Impact	Description
		<p>development is situated along the existing servitude, and therefore, the disturbances to the natural ecosystems and vegetation clearance will be relatively small. The mitigation measures within the Nature reserve must be enforced.</p> <p>While the proposed development will have the above-mentioned low negative impacts, these impacts are expected to be minimal. This is because the project is an extension of the existing substation and will be contained within the boundaries of the Majuba Power Station, thereby limiting the overall disruption to the surrounding environment.</p>
Flora and Fauna	Negative	<p>According to the Screening report for Environmental Authorization as required by the 2014 EIA regulations the relative animal species theme sensitivity is considered as High sensitivity (Medium-High), the relative plant species theme sensitivity is considered as Medium (Low-Medium), and the terrestrial biodiversity Theme sensitivity is assigned a Very High Sensitivity due to the presence of Majuba Nature Reserve, CBA 2, ESA: Protected Area buffer, FEPA Sub catchment and National Protected Area Expansion Strategy (NPAES).</p> <p>During the field survey, it was found that the impacts of the proposed development site on flora and fauna can be mitigated to a satisfactory level, and as such, the development is deemed acceptable from the ecological perspective and, as such, should not be prevented from proceeding based on the ecological considerations, provided that the mitigation measures are implemented and adhered to. The methodologies, results found during the field survey, and the impacts and mitigation measures provide confidence that the project can proceed. Once the proposed development has been constructed, a rehabilitation process needs to take place and should also ensure that alien plant emergence and erosion do not occur</p>
Noise	Negative	<p>During construction, noise levels will likely vary depending on specific activities. Typical noise sources include heavy machinery, equipment operation, and vehicle movement. Elevated noise levels are expected during activities such as</p>

Aspect	Impact	Description
		excavation, foundation work, and the installation of heavy equipment. However, these noise levels will be temporary. They can be mitigated through proper planning and noise control measures, such as scheduling noisy activities during less sensitive times of the day and using noise barriers if necessary.
Waste	Negative	<p>Naturally, the land's occupancy by the construction team will result in the accumulation of various forms of waste in the area. The area's aesthetic value would decrease if waste were not collected and disposed of appropriately. Waste material will be generated during the construction phase. Such waste may accumulate from site personnel's campsite or litter left around the work area by the construction staff. Other waste substances may come from cement bags, amongst other construction materials.</p> <p>Although reduced, waste has a definite impact and will last for the construction and operational phases.</p>
Soil	Negative	The movement of heavy machinery and vegetation clearance may destabilise soils, making them susceptible to erosion. Similarly, the continuous movement of vehicles over the land during the construction phase may expose it to erosion.
Heritage	Neutral	According to the Department of Forestry, Fisheries and the Environment (DFFE) Screening Tool Report, the area's heritage sensitivity is low. The specialist study's findings also confirmed this assessment.
Hazardous substances	Negative	Hazardous substances will be in the form of spillages of hydrocarbons from vehicles during construction. The risk of spillage of various hazardous substances may occur during the use of heavy machinery, construction vehicles, and construction vessels; for instance, spillage results from fuel leaks, refueling, or collision. Hydrocarbons are toxic to aquatic organisms, and precautions must be taken to prevent them from contaminating the surrounding rivers and tributaries.



Aspect	Impact	Description
		<p>All fuel and oil must be stored with adequate spill protection, and no leaking vehicles should be permitted on site. The intentional disposal of any substance into the river system is prohibited. Any accidental spillage must be prevented, contained, and reported immediately.</p>
<p>Social Impact Assessment</p>	<p>Neutral</p>	<p>The following impacts can be expected during construction:</p> <ul style="list-style-type: none"> <li>• Access across the site</li> <li>• Crime and security</li> <li>• Health issues                             <ul style="list-style-type: none"> <li>○ Physical hazards include falls, machinery injuries, and other accidents.</li> <li>○ Ergonomic Issues such as musculoskeletal disorders from repetitive motion, heavy lifting, and awkward postures.</li> <li>○ Air quality impact such as respiratory issues due to dust and particulate matter.</li> </ul> </li> <li>• Economic issues                             <ul style="list-style-type: none"> <li>○ Costs related to minimizing environmental impact, such as pollution control and habitat restoration.</li> </ul> </li> <li>• Job creation</li> <li>• Small and Medium Enterprise opportunities</li> <li>• Traffic disruption</li> </ul> <p>During construction, access across the site can be more disruptive in densely populated residential and commercial areas than in less populated rural areas. Therefore, the Contractor must consult with property owners, local authorities, and communities to inform all affected parties about the timing and extent of any disruption. However, for this project, such access issues will not arise since the project is within the operating Majuba Power Station.</p>

Aspect	Impact	Description
Surface and Groundwater Pollution	Negative	<p>The study area is less than 500 meters from the watercourse. This indicates the potential for project impacts on surface and groundwater through soil disturbance, erosion from construction activities, and potential chemical spills. It alters surface water flow temporarily and increases stormwater runoff due to new impervious surfaces, reducing groundwater recharge. Long-term operational risks include pollution from oils and coolants, potentially affecting soil and groundwater quality. Mitigation involves erosion control, spill prevention, effective stormwater management, proper waste disposal, and ongoing water quality monitoring to comply with environmental regulations and minimize these impacts over time.</p>
Traffic	Negative	<p>Given the project's relatively small size, the amount of material and equipment delivered to the site during construction will be minimal. Therefore, the impact on the N11 and other access roads, which form the primary access to the study area, is expected to be less significant. Properly managed construction vehicles will ensure road safety for other road users.</p>
Agriculture	Neutral	<p>No active agricultural practice is taking place in the study area's immediate vicinity. Therefore, the cumulative loss from a soil and land capability point of view is anticipated to be negligible.</p> <p>During the construction phase of the proposed development, the soil is anticipated to be exposed to erosion, dust emission, potential soil contamination, and loss of land capability impacts. The main envisaged activities include the following:</p> <ul style="list-style-type: none"> <li>• Frequent movement of heavy machinery increasing the likelihood of soil contamination from petroleum, oil, and grease substances;</li> <li>• Other activities in this phase that will impact soil are handling and storing building materials and different kinds of waste. When not managed properly, these activities could potentially result in soil pollution.</li> </ul>

Aspect	Impact	Description
		<ul style="list-style-type: none"> <li>• The disturbance of original soil profiles and horizon sequences during earthworks is a measurable erosion deterioration.</li> <li>• Soil chemical pollution due to potential oil and fuel spillages from vehicles is a moderate deterioration of the soil resource.</li> <li>• Soil compaction will be a measurable deterioration caused by heavy vehicles commuting on the existing roads and any newly widened access road to increase access to the substations.</li> </ul>
Climate	Neutral	The proposed substation will not significantly impact the local climate conditions or contribute to regional or global climate change.

## 11.2 SUMMARY OF SPECIALIST FINDINGS

Table 19: Summary of Specialist findings

Specialist	Findings
Heritage Assessment	<p>The Sensitivity confirmed the impact to be negligible, as neither old buildings/infrastructure nor heritage artifacts were noted within or near the proposed site.</p> <p>Generic precautionary/mitigation measures, as detailed in the EMP, must be implemented.</p>
Terrestrial Assessment	<p>The proposed project area is within the Majuba Nature Reserve but does not fall under Critical Biodiversity Areas. However, it is situated in a heavily modified and only three micro-habitats, namely watercourses, grasslands, and exotic trees, are found on or near the project site.</p>

Specialist	Findings
Palaeontology Assessment	<p>The project’s surface activities could affect fossil heritage within the development area. The geological structures indicate the presence of rocks that could contain fossils, but these fossils are very rare and unpredictably distributed. The excavated material will be soil, which does not preserve fossils. Although there is a very small chance that fossils may be present in the shales of the Volksrust Formation and could be disturbed, a Fossil Chance Find Protocol has been included in the report. Overall, the potential impact on fossil heritage resources is very low.</p>
Aquatic and Wetland Assessment	<p>Potential impacts of the proposed activity on the associated freshwater ecosystem were assessed in terms of a formalised method whereby a typical risk assessment process was undertaken in order to determine the significance of the potential impacts without the application of mitigation/management measures (i.e., without mitigation measures, or WOMM). Once the significance of the impacts without the application of mitigation/management measures was known, the impacts were then re-evaluated, taking cognisance of proposed mitigation/management measures provided in order to reduce the impact (i.e. with mitigation measures, or WMM), thus enabling an understanding of the overall impact after the implementation of mitigation/management measures.</p>
Agricultural Assessment	<p>The proposed development areas are located in an industrialised area where electricity generation occurs. The area is characterised by previously excavated and backfilled areas mixed with firm material. No active agricultural practice is taking place in the study area's immediate vicinity. Therefore, the cumulative loss from a soil and land capability point of view is anticipated to be negligible. Agricultural activities outside the power station boundary will continue unhindered.</p>
Civil Aviation	<p>The proposed project site is located approximately 13 km from the Amersfoort Aerodrome, placing it outside the 8 km high-risk zone but within the 15 km medium-risk zone. This distance suggests a moderate risk associated with aviation activities from the aerodrome. Additionally, there are other unlicensed aerodromes in the vicinity of the project site, which could further influence risk assessments and operational considerations for the project. These factors should be accounted for in the project's planning and development stages to ensure safety and compliance with relevant regulations. Considering the proposed expansion of what is existing, the impact will be negligible.</p>

## 12 METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is primarily based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The evaluation considers impacts arising from the project's proposed activities before and after implementing appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according to extent, duration, magnitude (intensity), and probability. A significance rating is obtained from these criteria, and the method and formula are described below. Where possible, mitigation recommendations have been made and are presented in tabular form.

The criteria in the tables below will be used for the evaluation. The nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance, and probability of occurrence attached to it.

**Table 20: Methodology used in determining the significance of potential environmental impacts.**

<p><b>Status of Impact</b></p> <p>The impacts are assessed as either having a:</p> <p>The negative effect (i.e., at a 'cost' to the environment),</p> <p>positive effect (i.e., a 'benefit' to the environment) or</p> <p>Neutral effect on the environment.</p> <p><b>Extent of the Impact</b></p> <p>(1) Site (site only),</p> <p>(2) Local (site boundary and immediate surrounds),</p> <p>(3) Regional (within the project area),</p> <p>(4) National, or</p> <p>(5) International.</p> <p><b>Duration of the Impact</b></p> <p>The length that the impact will last is described as either:</p> <p>(1) immediate (&lt;1 year)</p> <p>(2) short term (1-5 years),</p> <p>(3) medium term (5-15 years),</p> <p>(4) long-term (ceases after the operational life span of the project),</p> <p>(5) Permanent.</p> <p><b>The magnitude of the Impact</b></p>
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The intensity or severity of the impacts is indicated as either:

- (0) none,
- (2) Minor,
- (4) Low,
- (6) Moderate (environmental functions altered but continue),
- (8) High (environmental functions temporarily cease), or
- (10) Very high / Unsure (environmental functions permanently cease).

#### Probability of Occurrence

The likelihood of the impact occurring is indicated as either:

- (0) None (the impact will not occur),
- (1) improbable (probability very low due to design or experience)
- (2) low probability (unlikely to occur),
- (3) medium probability (distinct probability that the impact will occur),
- (4) high probability (most likely to occur), or
- (5) Definite.

#### Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (S). This rating is formulated by adding the sum of the numbers assigned to extent (E), duration (D) and magnitude (M) and multiplying this sum by the probability (P) of the impact.

$$S=(E+D+M) P$$

The significance ratings are given below.

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

### 12.1 ASSESSMENT OF IMPACTS

The following section presents the impacts and the significance as rated by the specialists as well as the EAP. The Tables below highlight the significance of the identified impacts for the proposed development's construction and operational phases.

The impacts are assessed according to the criteria outlined below. Each issue is ranked according to extent, duration, magnitude (intensity), and probability. From these criteria, a significance rating is obtained; the method

and formula are also described below. Mitigation measures and recommendations have been made and are presented in tabular form below.

The ratings are assessed with and without mitigation and color-coded as follows to indicate the significance:

High	>60
Medium	>30 - 60
Low	<30

## 12.2 IMPACTS RELATING TO CONSTRUCTION PHASE

The following specialist studies were identified for the project: Terrestrial Biodiversity, Aquatic and Wetland, Heritage, Paleontology, Agricultural, Civil Aviation, and Defense.

### 12.2.1 SOILS AND EROSION

The loss of topsoil in South Africa is a national concern; thus, erosion control measures should be taken seriously. Ineffective stormwater management systems and the unnecessary clearance of vegetation can result in soil erosion. Where soils are highly erodible, adequate measures must be implemented to prevent undue soil erosion. Extensive soil erosion is not expected during the construction of the proposed substation due to the minimal vegetation that will be cleared and other soil disturbances.

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Soil contamination from hazardous substance spillages (Fuel) outside their primary and secondary containment during maintenance work and re-fueling.</li> </ul>							
Soil contamination	No	Negative	2	3	6	4	44 = Medium
	Yes	Negative	1	2	2	2	10 = Low
<b>Mitigation Measures</b>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>Where contamination of soil is expected, analysis must be done before disposal of excess soil to determine the appropriate disposal method.</li> <li>Fuel and material storage must be away from stockpiles.</li> <li>The Environmental Control Officer should ensure that potentially harmful materials are appropriately stored in a dry, secure, ventilated environment, with concrete or sealed flooring and a means of preventing unauthorised entry.</li> <li>Cement, concrete, and chemicals must be mixed on an impervious surface, and provisions should be made to contain spillage or overflows into the soil.</li> <li>Any storage tanks containing hazardous materials must be placed in banded containment areas with sealed surfaces. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.</li> <li>Contaminated soil must be contained and disposed of offsite at an approved landfill site.</li> <li>Concrete mixing must be contained within a banded designated area.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Erosion caused by inadequate/failing stormwater management measures/designs.</li> </ul>							
Soil Erosion	No	Negative	2	3	6	4	44 = Medium
	Yes	Negative	1	2	2	2	10 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Regular monitoring for erosion after construction to ensure that no erosion problems have developed because of the disturbance.</li> <li>All erosion problems observed should be rectified as soon as possible using the appropriate soil erosion control structures and revegetation techniques.</li> <li>All cleared areas should be landscaped and/or re-vegetated.</li> </ul>							

12.2.2 IMPACT ON TRAFFIC

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							



Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>The anticipated increase in traffic loads is expected to be minimal due to the small scale of the project, thus posing a negligible impact on existing traffic flow.</li> <li>The limited number of construction vehicles required for the project will result in a minimal decrease in road safety for other road users.</li> <li>The controlled and minimal movement of construction vehicles, aligned with strict project protocols, will prevent unnecessary environmental impacts, thereby avoiding vegetation and habitat destruction.</li> </ul>							
Traffic	Yes	Negative	2	1	2	2	10 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>The delivery of construction materials and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads.</li> <li>Access roads must be marked.</li> <li>Delivery vehicles must comply with all traffic laws and bylaws.</li> <li>A speed limit of 30 km per hour must be maintained.</li> </ul>							
<b>Operational Phase</b>							
None.							
Traffic	Yes	Negative	1	1	2	1	4 Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Existing roads used during construction must be used during operation during maintenance.</li> </ul>							

12.2.3 CHANGES IN SEDIMENT ENTERING AND EXITING THE WATER RESOURCE

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Earthwork activities during substation construction.</li> <li>Clearing and soil disturbance, resulting in sedimentation. In addition, Indigenous vegetation communities are unlikely to colonize eroded soils successfully, and seeds from proximate alien invasive trees can spread quickly into these eroded soils.</li> <li>Disturbance of slopes by creating roads and tracks adjacent to the watercourse.</li> <li>Erosion (e.g., gully formation, bank collapse)</li> </ul>							
Sediments	Yes	Negative	2	2	4	3	24 = Low

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>It is likely that water will be contaminated within earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water, reducing the risk of erosion. Effective sediment traps should be installed.</li> <li>Only remove vegetation in areas essential for construction and do not allow any disturbance to the adjoining natural vegetation cover.</li> <li>Measures must be put in place to control excess water flow so that it does not impact the surface vegetation.</li> <li>Protect all areas susceptible to erosion and ensure that activities within and adjacent to the construction camp and work areas do not result in undue soil erosion.</li> <li>Runoff from the construction area must be managed to avoid erosion and pollution problems.</li> <li>Buffer zones must be put in place to trap sediments from entering the nearby watercourses.</li> <li>Monitoring should be done to ensure that sediment pollution is timeously addressed.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Disturbance of soil surface during maintenance of towers.</li> <li>Implementation of best management practices.</li> <li>Contamination of water resources.</li> </ul>							
Sediments	Yes	Negative	2	3	4	3	27 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Monitoring should be done to ensure that sediment pollution is timeously dressed.</li> </ul>							

**12.2.4 PALAEOLOGY**

Based on experience and the lack of previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils of the Quaternary. There is a very small chance that fossils may occur below the soil in the shales of the Volksrust Formation, so a Fossil Chance Find Protocol should be added to the EMPr. The impact on the palaeontological heritage would be low, so as far as paleontology is concerned, the project should be authorised.

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>There is a slight chance that fossils may be present below the soil in the shales of the Volksrust Formation, so a Fossil Chance Find Protocol should be added to the EMPr.</li> </ul>							
Palaeontology	Yes	Negative	2	1	4	2	14 = Low
Mitigation Measures							
<ul style="list-style-type: none"> <li>If fossils are found by the environmental officer or another responsible person once excavations for foundations and infrastructure have commenced, then they should be rescued, and a palaeontologist should be called to assess and collect a representative sample.</li> </ul>							

### 12.2.5 LOSS AND DISTURBANCE OF WETLAND/RIPARIAN HABITAT

Impacts	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Sedimentation of wetlands</li> <li>Destruction of wetland habitat and associated loss of wetland functionality</li> <li>Changes to surface and sub-surface flow regimes</li> </ul>							
Wetland/Riparian Habitat	No	Negative	2	2	6	4	40 = Medium
	Yes	Negative	2	2	6	2	20 = Low
Mitigation Measures							
<ul style="list-style-type: none"> <li>Avoid construction activities in wetlands as far as possible through proper planning, demarcation, and appropriate environmental awareness training. Appropriate no-go areas must be assigned next to the valley-bottom wetland. Work should be kept as far as possible upslope from the wetland, e.g., placing soil stockpiles from the excavations and installing soil curtains or swales to capture any possible run-off.</li> <li>All construction staff must be informed of the need to be vigilant against any practice that will impact wetlands. For example, Do not take shortcuts through valley bottoms (wetlands) but use existing road infrastructure.</li> <li>Any proclaimed weed or alien species germinating during construction and operational periods shall be cleared.</li> <li>Caution must be taken to ensure building materials are not dumped or stored within the delineated wetland zones</li> </ul>							

Impacts	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>Emergency plans must be in place in case of spillages.</li> <li>Littering and contamination of water sources during construction must be mitigated by effective construction camp management.</li> <li>All construction materials, including fuels and oil, should be stored in a demarcated area within a bunded impermeable surface to avoid contamination (outside of wetlands or wetland buffer zones).</li> <li>Cement and plaster should only be mixed within mixing trays. Equipment should also be washed and cleaned within a bermed area to trap any cement or plaster and avoid excessive soil erosion. These sites must be rehabilitated prior to commencing the operational phase.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Destruction of wetland habitat and associated loss of wetland functionality.</li> </ul>							
Wetland/Riparian Habitat	Yes	Negative	2	2	6	4	40 = Medium
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Use designated roads to access the site.</li> <li>Minimise development footprint.</li> <li>Delineate 30-50m buffers from aquatic habitats.</li> <li>Monitor and report on their effectiveness.</li> <li>Monitoring and reporting on the implementation of mitigation controls should be undertaken at least bi-annually during the operational phase.</li> <li>Preserve as much of the natural habitat as possible during the substation operation to lessen the operational impacts and reduce the irreversibility of impacts.</li> <li>Effective restoration of the intact natural habitats before the development should be implemented and reported.</li> <li>Maintenance activities should not take place within watercourses or buffer zones, nor should edge effects impact these areas.</li> </ul>							

12.2.6 SURFACE AND GROUNDWATER POLLUTION

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Exposed surfaces during construction would provide a source of sediments to be taken up by stormwater, resulting in downstream sedimentation of water resources.</li> </ul>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>construction material may pollute the surface and ground water on site resulting from spillage of hydrocarbons.</li> <li>Pollution of the wetland ecosystem and impact on the water quality.</li> </ul>							
Surface and Groundwater	No	Negative	1	2	6	3	27 = Low
	Yes	Negative	1	3	2	3	18 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>No activities should occur within a 100m or a 1:100-year flood line, whichever is greatest, without approval from DWS.</li> <li>Care must be taken during construction to prevent leaks and spillage of materials that may detrimentally affect water quality (especially fuels and chemicals).</li> <li>Care must be taken to avoid the destruction of water courses.</li> <li>Adequate measures must be put in place to prevent runoff of construction debris to nearby water bodies.</li> <li>The use of any temporary, chemical toilet facilities must not cause any pollution to a water resource or pose a health hazard. In addition, these toilets must not be situated within 100m of a watercourse or within the 1:100-year floodline (whichever is the greatest). Furthermore, no form of secondary pollution should arise from the disposal of refuse or sewage from the temporary, chemical toilets. Any pollution problems arising from the above must be addressed immediately by Eskom.</li> <li>It is important that any significant spillage of chemicals, fuels, etc., during the construction and/or operational phases is reported to this Office and other relevant authorities.</li> <li>Stockpiling of soil or other materials used during construction must not be allowed on or near steep slopes, a watercourse, or a water body.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Pollution of the wetland and river ecosystem, which leads to impacts on the water quality.</li> </ul>							
Surface and Groundwater	Yes	Negative	1	1	4	2	12 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Care must be taken during construction to prevent leaks and spillage of materials that may detrimentally affect water quality (especially fuels and chemicals).</li> <li>Care must be taken to avoid the destruction of water courses.</li> </ul>							

12.2.7 IMPACTS ON AVIATION

Impacts	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
The proposed substation is located approximately 12km from an unlicensed airfield. No major impacts are anticipated as this is a 132kV Substation, and there is already an existing Power Station where the project is proposed.							
Aviation	No	Negative	1	4	2	2	14 = Low
	Yes	Negative	1	4	2	2	14 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>No construction area should be located near the airfield.</li> <li>Construction works should be avoided within 1 km of the airfield.</li> </ul>							
<b>Operational Phase</b>							
None.							
Aviation	Yes	Negative	1	4	2	1	47= Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>The ariel spheres must be installed on the overhead powerline.</li> </ul>							

12.2.8 WASTE GENERATION

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>The area's aesthetic value would decrease if waste were not collected and disposed of appropriately.</li> <li>Litter left around the work area by the construction staff.</li> </ul>							
Waste Generation	No	Negative	1	2	4	4	28 = Low
	Yes	Negative	1	2	4	2	8 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>No waste will be buried on-site or incorporated into the foundation trenches;</li> <li>The workforce must be encouraged to sort waste into recyclable and non-recyclable waste;</li> <li>No burning of waste will be allowed, and</li> </ul>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>Waste must be regularly removed from the site and disposed of at a registered waste disposal facility, and proof of disposal must be kept on site.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Litter left around the work area by the maintenance staff.</li> <li>Should private contractors be used, all solid waste must be disposed of at a permitted landfill site, and proof of this must be made available to the Department when required.</li> <li>Washing, refueling, maintaining vehicles, or the transfer of hazardous substances must be conducted within a bunded area. All drainage from the bunded area must be treated as water-containing waste and disposed of safely.</li> </ul>							
Waste Generation	Yes	Negative	1	1	2	1	4 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Waste must be regularly removed from the site and disposed of at a registered disposal facility.</li> </ul>							

12.2.9 IMPACT ON AVIFAUNA

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Collision of birds with infrastructures.</li> <li>Electrocution of birds.</li> <li>Loss of priority avian species from important habitats.</li> <li>Loss of resident avifauna through increased disturbance.</li> <li>Long-term or permanent degradation and modification of the receiving environment resulting in the loss of critical avian habitats.</li> </ul>							
Avifauna	No	Negative	2	4	4	3	30 = Medium
	Yes	Negative	1	2	2	2	10 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>All construction and maintenance activities should be carried out according to generally accepted environmental best practices. Care should be taken near the non-perennial river found within the Ararat site. Existing roads must be used as far as possible for access during construction.</li> </ul>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>During the operational phase, any nest found on the lines should be managed in accordance with Eskom Distribution Nest Management Guidelines and relevant provincial and national legislation.</li> <li>To prevent the electrocution of birds, on the poles, all poles should be fitted with a standard type, Eskom-approved “bird perch” at the top of the pole. This will provide ample safe perching space for birds clear of the dangerous hardware.</li> </ul>							
<b>Operational Phase</b>							
<ul style="list-style-type: none"> <li>Loss of resident avifauna through increased disturbance.</li> <li>Electrocution risks lead to injury or loss of avian life, decreasing avifauna species' diversity.</li> </ul>							
Yes	Negative	2	4	4	4	40 = Medium	
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Demarcate sections requiring the installation of deterrents/flappers on all the necessary sections of the substation or directly adjacent to the site.</li> </ul>							

12.2.10 IMPACTS ON ECOLOGY

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>Natural vegetation could be destroyed by vegetation clearance or the illegal disposal of construction materials such as oil, cement, etc.</li> <li>Increased soil erosion, increase in silt loads and sedimentation.</li> <li>Establishment and spread of declared weeds.</li> <li>Clearing, leveling, and grubbing will expose the soils, which, in rainy events, would wash down into moist grasslands along most of the route alignments, causing sedimentation and erosion.</li> </ul>							
Ecology	No	Negative	3	5	8	4	64 = High
	Yes	Negative	1	3	6	4	40 = Medium
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>An Independent Environmental Control Officer (ECO) must be appointed to oversee construction.</li> <li>Areas designated for vegetation clearing should be identified and visibly marked off.</li> <li>Vegetation clearing in natural areas should be kept to a minimum and restricted to the proposed development footprint, i.e., the confirmed servitude and access roads.</li> </ul>							



Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
		<ul style="list-style-type: none"> <li>• A temporary fence or demarcation must be erected around the construction area (including the servitude, construction camps, areas where material is stored, and the actual footprint of the development) to prevent access to sensitive environs.</li> <li>• Prohibit vehicular or pedestrian access into natural areas beyond the demarcated boundary of the construction area.</li> <li>• No open fires are permitted within naturally vegetated areas.</li> <li>• Formalise access roads and use existing roads, including farm roads and tracks, where feasible rather than creating new routes through naturally vegetated areas.</li> <li>• Construction workers may not remove flora, nor may anyone collect seeds from the plants without permission from the local authority.</li> <li>• Runoff from roads must be managed to avoid erosion and pollution problems.</li> <li>• Remove only the vegetation essential for construction, and do not allow any disturbance to the adjoining natural vegetation cover. The grassland can be removed as sods and re-established after construction is completed.</li> <li>• After construction, the land must be cleared of waste, surplus materials, and equipment, and all parts of the land must be left in a condition as close as possible to that before construction.</li> </ul>					

12.2.11 NOISE POLLUTION

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
		<ul style="list-style-type: none"> <li>• An increase in noise is expected due to construction activities, which might have a minor impact.</li> </ul>					
Noise Pollution	No	Negative	2	2	2	4	24 = Low
	Yes	Negative	1	2	2	3	15 = Low
<b>Mitigation Measures</b>							
		<ul style="list-style-type: none"> <li>• Mobile equipment, vehicles, and power generation equipment should undergo noise tests measured against manufacturer specifications to confirm compliance before deployment on-site.</li> <li>• It must be ensured that all vehicles used during construction are appropriately maintained.</li> <li>• Select equipment with lower sound power levels in accordance with the Health and Safety Regulations.</li> </ul>					
<b>Operational Phase</b>							
		<ul style="list-style-type: none"> <li>• No noise impacts are anticipated.</li> </ul>					

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Noise Pollution	Yes	Negative	1	4	0	1	5 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Maintenance vehicles and equipment and power generation equipment should be subject to noise tests measured against manufacturer specifications to confirm compliance before deployment on-site.</li> </ul>							

### 12.2.12 IMPACT ON HERITAGE RESOURCES

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>There is also a high chance of finding archaeological sites, which will be difficult to avoid since most of these are trifling and often hidden underground, only exposed once construction begins. Although no Stone/ Iron Age site remains were noted during the site visit, the area could still contain sites.</li> <li>There are no major heritage flaws which can hamper the accomplishment of this project</li> </ul>							
Heritage Resources	No	Negative	1	2	4	2	14= Low
	Yes	Negative	1	2	2	1	5 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>Before construction, awareness must be raised to identify and protect archaeological remains should they be discovered during the project. Pre-construction awareness should include limited site recognition training for the types of archaeological sites that may occur in the construction areas. Below are some of the indicators of an archaeological site that may be found during construction: <ul style="list-style-type: none"> <li>Flaked stone tools, bone tools, and loose pieces of flaked stone;</li> <li>Ash and charcoal;</li> <li>Bones and shell fragments;</li> <li>Artefacts (e.g., beads or hearths);</li> <li>Packed stones that might be uncounted underground, indicating a grave or collapsed stone walling.</li> </ul> </li> <li>If any of the heritage artifacts (Flaked stone tools, bone tools and loose pieces of flaked stone, Ash and charcoal, Bones and shell fragments, beads or hearths, packed stones which might be uncounted underground and might indicate a grave or collapse stone walling) are unearthed, all construction within a radius of at least 10m of such indicator should cease. The area is demarcated by a danger tape.</li> </ul>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>A professional archaeologist or SAHRA officer should be contacted immediately. In the meantime, the Contractor must protect the site from publicity (i.e., media) until a mutual agreement is reached.</li> <li>It must be noted that any measures to cover up the suspected archaeological material or collect any resources are illegal and legally punishable. In the same manner, no person may exhume or collect such remains, whether of recent origin or not, without the endorsement by SAHRA.</li> </ul>							

12.2.13 SOCIO-ECONOMIC

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>The demand for equipment, building materials, and labor will increase.</li> <li>Employment opportunities for construction activities.</li> <li>Secondary service provision, such as food supply, toilet hire, equipment maintenance, and many more, would also stimulate the local economy.</li> </ul>							
Socio-Economic	No	Negative	3	3	6	4	48 = Medium
	Yes	Positive	4	4	8	4	64= High
<b>Mitigation Measures:</b>							
<ul style="list-style-type: none"> <li>Where excavation happened, Contractors need to ensure that those sites are fenced off to prevent people and animals from falling into the pit.</li> <li>Adequately and promptly repair damage caused to any infrastructure by contractors to an acceptable standard.</li> <li>The culture and lifestyles of the communities near the proposed development must be respected.</li> <li>A register of all complaints or queries received and actions taken must be maintained.</li> <li>To reduce the criminal activity associated with the project, the following measure needs to be in place:                         <ul style="list-style-type: none"> <li>Ensure that all staff, including contractors' staff, can always be identified with identity cards and wear identifiable clothing.</li> <li>The perimeter of the construction site should be appropriately secured to prevent unauthorised access to the site.</li> <li>The provision of Personnel Protective Equipment (PPE) will assist in reducing health impacts.</li> </ul> </li> <li>Where possible, for all unskilled jobs, use local labour as far as possible.</li> <li>Work with the local municipality and social facilitator to establish an SME database.</li> </ul>							
<b>Operational Phase:</b>							

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<ul style="list-style-type: none"> <li>• Increase electricity demand for more economic activities in the area;</li> <li>• Help strengthen the supply network in an area experiencing low voltage;</li> <li>• Improve the security of electricity supply, thus benefiting users in the region and country as a whole;</li> <li>• Address municipality backlog for electricity supply; and</li> <li>• Improve the economic status of the country</li> </ul>							
Socio-Economic	Yes	Positive	4	5	10	5	95 = High

### 12.3 DECOMMISSIONING PHASE

Where necessary, ongoing maintenance and upgrades will be carried out. Decommissioning will be subjected to an EIA process; however, potential impacts are assessed hereunder.

#### Dust Generation

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Decommissioning of the facility and other infrastructure may increase the number of airborne particles in the local atmosphere as the infrastructure is dismantled and transported to the disposal site. However, with proper mitigation in place, this impact will be of low significance.							
Dust Generation	No	Negative	Local	Immediate	Low	High	Medium
	Yes	Negative	Local	Immediate	Low	Medium	Low
Corrective Actions	<ul style="list-style-type: none"> <li>• Personnel must be well versed in the relevant existing waste management procedures and activities on-site and</li> <li>• This will include sorting waste types and correct disposal to recycling facilities, local registered waste disposal sites, and, in extreme cases, registered hazardous waste disposal sites.</li> </ul>						

- SURFACE AND GROUNDWATER POLLUTION

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
During the decommissioning phase, construction vehicles and machinery spillages may occur when the existing facility is removed from the site. Potential sources of pollution to this resource result from surface and sub-surface activities that could possibly leak and or spill hazardous substances onto the surface that are							

then transported to the groundwater body through the underlying soils. It is anticipated that the significance rating can be reduced to low with the implementation of mitigation measures							
Surface and Ground Water Pollution.	No	Negative	Local	Immediate	Moderate	High	Medium
	Yes	Negative	Local	Immediate	Low	Medium	Low
Corrective Actions	<ul style="list-style-type: none"> <li>• Drip trays must be placed underneath parked construction equipment;</li> <li>• Adequate spill kits must be provided on-site;</li> <li>• Possible leaks and spills of hazardous substances into the ground should be avoided at all times, and</li> <li>• In the event of a hazardous substance spillage, the EMPr's requirements must be implemented.</li> </ul>						

• SOIL EROSION

Issue	Corrective Measure	Impact Rating Criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Clearing vegetation and soil exposure during facility decommissioning may lead to erosion of these surfaces due to rain and wind. The implementation of the recommended mitigation measures is anticipated to reduce the significance of this impact from medium negative to low negative.							
Surface and Ground Water Pollution.	No	Negative	Local	Immediate	Moderate	High	Medium
	Yes	Negative	Local	Immediate	Low	Low	Low
Corrective Actions	<ul style="list-style-type: none"> <li>• No unnecessary clearing of vegetation will be allowed;</li> <li>• Construction vehicles and machinery to be driven on designated roads and</li> <li>• Areas cleared of vegetation must be re-vegetated with indigenous vegetation.</li> </ul>						

12.4 CUMULATIVE IMPACTS

Cumulative impacts about an activity mean the past, present, and reasonably near future impacts of an activity, considered together with the impacts of activities associated with that activity, which may not be significant but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations). The most important concept related to cumulative impact is an acceptable level of environmental change. A cumulative impact only becomes relevant when the impact of the proposed development will lead directly to the sum of impacts of all developments, causing an acceptable level

of change to be exceeded in the surrounding area. If the impact of the development being assessed does not cause that level to be exceeded, then the cumulative impact associated with that development is not significant. The cumulative impact significance rating was defined according to the predicted impacts before and after mitigation measures recommended by the specialists. The cumulative impact significance rating was considered when preparing the motivation for the need and desirability of the proposed development.

This section provides cumulative impact ratings of the proposed project, including waste generation, socio-economic, traffic, and noise. It also outlines the mitigation measures of each rated cumulative impact as follows:

#### 12.4.1 WATER RESOURCES

The cumulative impacts of developments within the catchments will cause an increase in surface water runoff and a decrease in infiltration, which will potentially result in an increase in erosion potential and sedimentation to the wetlands downstream. Attenuation of surface water runoff and its subsequent diffused release is imperative to control on-site and not accentuate the problem within the larger catchment. The development of a comprehensive surface runoff and sensitive stormwater management plan is therefore required, indicating how all surface runoff generated because of the development (during both the construction and operational phases) will be managed (e.g. artificial wetlands/stormwater and flood retention ponds/ attenuation and diffuse release mechanisms) prior to entering any local/regional drainage system. This plan should, therefore, indicate how surface runoff will be retained and subsequently released to simulate natural hydrological conditions.

#### 12.4.2 AVIFAUNA

Existing Eskom powerlines within the site connect to the existing 400kV Yard and will further connect to the proposed 132kV substation, which might have a visual impact. The cumulative impacts below are drawn from the previous related project.

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
Impact on avifauna	No	Negative	3	4	2	2	18 = Low
<b>Mitigation Measures:</b>							
<ul style="list-style-type: none"> <li>Watercourses, drainage lines, streams, and wetlands must be avoided, and a no-go buffer of m must be applied around them;</li> <li>Signage must be put all around the project site to bring awareness amongst the staff and laborers to be sensitive towards the birds and wildlife that reside in the project area;</li> </ul>							

- All project activities must be undertaken with appropriate noise mitigation measures to avoid disturbance to human as well as avifauna populations in the region;
- Facility lighting during construction and operation should be kept to a minimum, and the latest technology should be used to ensure that light disturbance is minimised. This will also reduce the attraction of insects (insectivorous birds) to the facility.

#### 12.4.3 TRAFFIC IMPACT

Impact	Corrective measures	Impact rating criteria					Significance
		Nature	Extent	Duration	Magnitude	Probability	
<b>Construction Phase:</b>							
<ul style="list-style-type: none"> <li>• Increased traffic loads may negatively impact existing traffic flow.</li> <li>• Construction vehicles may decrease road safety for other road users.</li> <li>• Uncontrolled movement of construction vehicles may result in unnecessary environmental impacts through vegetation and habitat destruction.</li> </ul>							
Traffic	No	Negative	1	2	4	2	14= Low
Impact	Yes	Negative	1	2	2	1	5 = Low
<b>Mitigation Measures</b>							
<ul style="list-style-type: none"> <li>• The delivery of construction material and equipment should be limited to hours outside peak traffic times (including weekends) prevailing on the surrounding roads where possible;</li> <li>• Existing access roads must be used, and</li> <li>• Delivery vehicles must comply with all traffic laws and bylaws.</li> </ul>							

### 13 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

During the draft phase of the BAR for the proposed development, the EAP considered the requirements stipulated in the EIA Regulation of December 2014 as amended and other relevant Acts and Regulations. The EAP hereby confirms that with the information available at the time of preparing this report, the following has been considered:

- The correctness of the information provided in the report;
- The inclusion of comments and inputs from stakeholders and Interested and Affected Parties (I&APs); and
- Any information provided by the EAP to the Interested and Affected Parties and any responses by the EAP to comments or inputs made by I&AP.

### 14 ENVIRONMENTAL IMPACT STATEMENT

## 14.1 A SUMMARY OF THE KEY FINDINGS OF THE ENVIRONMENTAL IMPACT ASSESSMENT

This draft BAR assesses the likely impact the development may have on the surrounding environment and provides recommendations regarding available alternatives, mitigation, and management measures. The process aims to ensure that impacts are identified and that negative impacts are anticipated, prevented, minimized, and remedied (should these be unavoidable). Where positive impacts are determined, these are enhanced as far as possible.

. The suggested mitigation measures must also be considered, and compliance should form a condition of any decision to proceed with the development. In addition, these conditions should be incorporated into a Generic EMPr to guide and inform sustainable environmental practices during the construction process. The identified management and mitigation measures, including those listed in this report, are listed in the EMPr.

### 14.1.1 PLANNING AND DEVELOPMENT PHASE

Impacts associated with the planning and development phase of the proposed activity include the creation of job opportunities for skilled engineers and planning professionals. This positive impact will be definite and short-term. No significant adverse impact has been associated with this phase or the proposed activity.

### 14.1.2 CONSTRUCTION PHASE

The positive impacts identified for this phase include job creation and a positive economic outlook for the mining community, the province, and the country at large; these impacts will be enhanced to maximize the benefits. The negative impacts associated with the construction phase of the proposed activity can be regarded as being of low to medium significance. These include the following:

- Impact on terrestrial biodiversity, plant and animal themes
- Impact on heritage;
- Impact on agriculture
- Heritage and palaeontology
- Impact on aquatic and wetlands.
- Impact on air quality

With corrective measures in place and the specialist's recommendations implemented, none of the identified negative impacts is considered a fatal flaw.

### 14.1.3 OPERATION PHASE



The operational phase of the proposed activity can have no significant negative impact. Positive impacts include enhanced and improved mine operations and a positive benefit for the country in terms of Gross Domestic Product (GDP).

#### 14.1.4 DECOMMISSIONING PHASE

It must be noted that decommissioning will not take place in the foreseeable future. However, negative impacts identified with the decommissioning phase include dust generation, waste generation, and potential surface and groundwater pollution. If decommissioning were to occur, it would have a negative impact due to job losses and waste generation and would be subject to the relevant regulations and approvals.

### 14.2 PROJECT RECOMMENDATION

The project should thus be authorised for the following reasons:

- The project motivation highlighted the need and desirability of the proposed project and the subsequent benefits, which included, amongst others, the extension of the life of mine and the following:
  - Job creation and skills development
  - Local economic development.
  - Reliable supply of electricity
  - Improvement of South Africa's socio-economic status.
- Given the current state of the economy, a project of this nature and magnitude cannot be ignored. It is acknowledged that the various phases of the proposed project will yield negative impacts on the environment; however, given the mitigation measures proposed, it can be confirmed that the identified socio-economic benefits far outweigh the negative consequences identified.
- The undertaking of the EA application is a positive step taken by the applicant to ensure environmental sustainability and to embrace the right to a healthy living environment in line with the requirements of the South African legislative framework. Therefore, the EIA Basic Assessment process and associated Public Participation Process are conducted as dictated by the provisions of the NEMA and associated regulations.
- The proposed activities have been under detailed assessment. The primary objective has been to assess the suitability of the proposed study area for the intended use from an environmental perspective. This thorough investigation was enhanced by input from ecologists, archaeologists, visual, avifauna, social, ecotourism, and agricultural specialists.
- The findings of the investigations from the specialists' input and the EAP have been comprehensively documented in this report, together with the specified recommendations. Based on the investigations, no fatal flaws or highly significant impacts that would impede the proposed development or necessitate redesign or termination of the project have been identified.

- The no-go alternative was assessed, and consideration of this option will have even greater social and economic consequences, particularly if the security of the electricity supply is compromised. Therefore, securing reliable supply is vital, given the country's various industrial and residential developments.
- The project has considered a transparent approach in undertaking the PPP process and continues to do so during this phase.
- With mitigation measures proposed as well as recommendations made by the specialist, the impacts are manageable

Based on the reasons highlighted above, it is recommended that the proposed project be approved and all management and mitigation measures implemented to reduce the environmental impact, particularly on biodiversity, avifauna, visual, ecotourism, and ecology.

## 15 IMPACT MANAGEMENT MEASURES IDENTIFIED FROM SPECIALIST REPORTS

The mitigation measures identified by the various specialists will be included in the table of recommendations.

## 16 ASSUMPTIONS AND LIMITATIONS

It is assumed that the technical data supplied by Eskom was correct and valid at the time of compilation of specialist studies and the Final Basic Assessment Report. Furthermore, it is assumed that the alternatives presented by Eskom are feasible.

### 16.1 PALAEOLOGY STUDY

According to Bamford 2024, based on the area's geology and the palaeontological record as we know it, the formation and layout of the dolomites, sandstones, shales, and sands are typical for the country, and only some might contain fossil plants, insects, invertebrates, and vertebrates. The sands of the Quaternary period would not preserve fossils.

### 16.2 AGRICULTURAL STUDY

The following assumptions, uncertainties, limitations, and gaps were applicable for the soil, land use, and land capability assessment:

- It is assumed that the infrastructure components will remain as indicated on the layout and that the activities for the construction and operation of the infrastructure are limited to that typical for a project of this nature;
- The soil survey was confined to the study area outline with consideration of various land uses outside the study area;

- Soil profiles were observed using a 1.5m hand-held soil auger; thus, a description of the soil characteristics deeper than 1.5m cannot be given; and
- Classifying soils as one specific form can be challenging due to the infinite variations in the soil continuum. Therefore, the classifications presented in this report are based on the "best fit" to South Africa's soil classification system.

### 16.3 TERRESTRIAL BIODIVERSITY STUDY

The following constraints/limitations applied to this assessment:

- The survey was undertaken in May 2024, which falls within the late flowering season for most plant species. However, the timing of the site visit is not seen to pose a constraint on the results of the study, and it is unlikely that any more visits would reveal information that would change the outcome of this assessment both in terms of ecosystems of special conservation concern and suitable habitats of species of particular conservation concern. Therefore, site visits that were conducted appear to be sufficient to address the objectives of this study.
- Weather conditions during the survey were favourable for recording fauna and flora.
- The focus of the survey remains a habitat survey that concentrates on whether species of conservation priority occur on the site.
- While assessment of the potential occurrence of SCC has been undertaken and is informed by readily available information, this provides only a surrogate indicator of the likelihood of such species occurring. However, this is appropriate given the project area's habitat degradation/transformation level.
- Data collection in this study relied heavily on data from representative, homogenous sections of vegetation units, as well as general observations, analysis of satellite imagery from the past until the present, generic data, and a desktop analysis.
- The potential of similar future developments in the same geographical area, which could lead to cumulative impacts, cannot be meaningfully anticipated.
- The impact descriptions and assessment are based on the author's understanding of the proposed development based on the site visit and information provided.
- Since ecological impact studies deal with dynamic natural systems, additional information may come to light later, and this Specialist can thus not accept responsibility for conclusions and mitigation measures made in good faith-based information gathered or databases consulted at the time of the investigation.

### 16.4 AQUATIC AND WETLAND STUDY

During the present study, the following limitations were experienced:

- To obtain definitive data regarding the biodiversity, hydrology, and functioning of particular wetlands, studies should ideally be conducted over several seasons and years. The current study relied on

information gained during a single field survey conducted during a single season, desktop information for the area, as well as professional judgment and experience;

- Wetland and riparian areas within transformed landscapes, such as urban and agricultural settings or mining areas with existing infrastructure, are often affected by disturbances that restrict the use of available wetland indicators, such as hydrophytic vegetation or soil indicators (e.g., as a result of dense stands of alien vegetation, dumping, sedimentation, infrastructure encroachment, and infilling). As such, wetland and riparian delineations as provided are based on indicators where available and the author's interpretation of the current extent and nature of the wetlands and riparian areas associated with the proposed activity;
- Wetland and riparian assessments are based on available techniques developed through the DWS. However, these qualitative methods have associated limitations due to the range of interdisciplinary aspects that must be considered. Current and historic anthropogenic disturbance within and surrounding the study area has resulted in soil profile disturbances as well as successional changes in species composition in relation to its original /expected benchmark condition;
- Delineations of wetland areas were dependent on the extrapolation of field indicator data obtained during field surveys, 5m contour data for the study area, and from the interpretation of georeferenced orthophotos and satellite imagery as well as historical aerial imagery data sets received from the National Department of Rural Development and Land Reform. As such, inherent orthorectification errors associated with data capture and transfer to electronic format are likely to decrease the accuracy of wetland boundaries in many instances and
- Wetlands outside the study area boundary were extrapolated using aerial imagery. However, some sampling was done outside the study boundaries to confirm findings and better interpret the hydro-pedological characterization of the study area.
- No other specialist studies were available when drafting this report to support findings for determining the Ecological Importance and Sensitivity of watercourses. However, all watercourses within the study and 500m from the study area were considered sensitive (except artificial wetland habitat).
- No hydro-pedological studies were available to confirm wetlands drivers and hydro-pedological responses associated with the terrain.
- Despite numerous attempts, the author could not download historical imagery (from the CDNGI Portal) to determine the benchmark state of the landscape and wetlands within the study area.

## 17 PERIOD TO WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The Environmental Authorisation (EA) should be valid for ten years before construction and the life of the substation after that.

## 18 CONCLUSION

The Basic Assessment has been undertaken in accordance with the provisions of the NEMA and the EIA Regulations of December 2014 as amended, as well as associated legislations. The alternatives have been proposed, and the primary objective was to assess their suitability and the impact of the proposed development. This report has comprehensively addressed the baseline environment, which forms the backdrop of the impact assessment. The information provided has been supported by specialist studies that were undertaken and attached hereto. No fatal flaws or highly significant impacts were identified that would necessitate substantial redesign or termination of the project. From the EAPs' and the Specialists' point of view, there is no reason why the development should not proceed if the recommendations made in this report and the specialists' reports are adhered to.

Furthermore, the following is recommended by the EAP:

- All mitigation measures the specialist makes must be considered during the construction and operational phases.
- During construction, Eskom must ensure that hydrocarbons and all biofuels are stored in a designated area away from the project area and in water resources to minimise the risk of contamination. The hydrocarbons/biofuels should also be appropriately handled in concrete lined with berm walls or bunded areas to avoid seepage into the groundwater resources. The storage area should not have any leakages and should be able to contain 110% of spillages.
- All permits, licenses, and other authorizations required by any Act, Policy, Law, or By-Law must be obtained before project commencement.
- Upon approval, the layout plan must include the construction area.
- All authorities with jurisdiction on the project, such as the DFFE, DWS, and Pixley Ka Seme Local Municipality, should be notified that construction will commence 14 days before construction activities begin.
- The 65m microwave mast may require clearance from the CAA. The SACAA's recommendations must be adhered to.
- Implement an integrated waste management approach based on minimisation, incorporating reduction, reuse, and disposal where appropriate.
- Unnecessary clearance of vegetation must be avoided at all costs. Vegetation clearance should be limited to the approved footprint. Sensitive seepage zones and wetlands must be avoided for tower placement. It is further recommended that no towers be placed within the 50m buffer of any wetland or river without the necessary licence.
- As per Section 19(1) of the NWA, Eskom must ensure that any pollution incident(s) (of a water resource) originating from the proposed project shall be reported to the Regional Office of the DWS within 24 hours.

The undertaking of this Basic Assessment process has fully complied with the requirements of the NEMA and associated regulations. Therefore, the proposed project should be authorised to proceed.

## REFERENCES

- Central Information Services (Eskom), 2010, Double Strain Pole 208 kN 15 - 90 DEG - General Arrangement
- DEAT, 1998 Guideline Document: Environmental Impact Assessment Regulations
- DEAT, 1998. A National Strategy for Integrated Environmental Management in South Africa. Compiled by Environomics
- Pixley Ka Seme Local Municipality IDP, 2021-2022. Integrated Development Plan for the Pixley Ka Semme Local Municipality.
- Marion Bamford, 2024. Palaeontology SSV for the proposed Extension of the 132kV Eskom Majuba Substation and associated infrastructure, Mpumalanga Province
- Mboneni Ecological Services, 2024. Terrestrial ecological impact assessment report for the Proposed Development of the New 132kV and Expansion of the 400kV Eskom Majuba Substation and associated Infrastructure, Gert Sibande District Municipality, Mpumalanga Province.
- Mucina, L. & Rutherford, M.C. (2006): South Africa, Lesotho and Swaziland vegetation. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria.
- Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. & Manyama P.A., (eds) (2009): Red List of South African plants 2009. *Strelitzia* 25, South African National Biodiversity Institute.
- Second Edition, E & FN Spon Press Landscape Institute and the Institute of Environmental Assessment and Management. (2002). Guidelines for Landscape and Visual Impact Assessment (GLVIA).