Phefumula Emoyeni One (Pty) Ltd

PHEFUMULA EMOYENI ONE ELECTRICAL GRID INFRASTRUCTURE

Final Environmental Scoping Report

DFFE Reference Number: 14/12/16/3/3/2/2596

14/12/16/3/3/2/2596
SEPTEMBER 2024

PUBLIC

Phefumula Emoyeni One (Pty) Ltd

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TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 41105236

OUR REF. NO. 14/12/16/3/3/2/2596

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Final Environmental Scoping Report

WSP

Building 1, Maxwell Office Park
Magwa Crescent West, Waterfall City
Midrand, 1685
South Africa

Phone: +27 11 254 4800

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2
Remarks	Draft Environmental Scoping Report Public Review	Final Environmental Scoping Report DFFE Ref: 14/12/16/3/3/2/2596	
Date	July 2024	September 2024	
Prepared by	Thirushan Nadar	Tshepho Mamashela	
Signature	-		
Checked by	Ashlea Strong	Ashlea Strong	
Signature	-	 Digitally signed by Ashlea Strong DN: cn=Ashlea Strong, c=ZA, o=WSP Group Africa, ou=Earth and Environment, email=ashlea.strong@wsp.com Date: 2024.09.09 12:53:45 +02'00'	
Authorised by	Ashlea Strong	Ashlea Strong	
Signature	-	 Digitally signed by Ashlea Strong DN: cn=Ashlea Strong, c=ZA, o=WSP Group Africa, ou=Earth and Environment, email=ashlea.strong@wsp.com Date: 2024.09.09 12:54:20 +02'00'	
Project number	41105236	41105236	
Report number	01	02	
File reference	"\\corp.pbwan.net\za\Central_Data\Projects\41100xxx\41105236 - Phefumela Emoyeni WEF\41 PA\01-Reports\04- Scoping Report\400kV\Final SR\		

GENERAL SITE INFORMATION

Technical details of the proposed Phefumula Emoyeni One electrical grid infrastructure

Location of the Site	Approximately 16km north-west of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province
Farm Portions	The grid connection will be located over 10 farm portions

Coordinates of the site and activity location

Component	Label	X Coordinate	Y Coordinate
Grid line DX 3 opt 1	1	29° 51' 4.547" E	26° 23' 41.576" S
Grid line DX 3 opt 2	2	29° 49' 0.182" E	26° 22' 50.964" S
Grid line DX 3 opt 2	3	29° 48' 22.377" E	26° 22' 0.207" S
Grid line DX 3 opt 2	4	29° 47' 57.776" E	26° 21' 50.152" S
Grid line DX 3 opt 2	5	29° 47' 53.517" E	26° 21' 31.969" S
Grid line DX1	6	29° 47' 56.427" E	26° 21' 25.384" S
Grid line DX 3 opt 1	7	29° 48' 2.359" E	26° 22' 28.149" S
Grid line DX 3 opt 1	8	29° 47' 57.631" E	26° 22' 23.809" S
Grid line DX 1	9	29° 47' 46.794" E	26° 21' 31.237" S
Grid line DX 1	10	29° 47' 23.419" E	26° 21' 33.837" S
Grid line DX 1	11	29° 44' 51.321" E	26° 22' 16.053" S
Grid line DX 1	12	29° 44' 19.842" E	26° 22' 8.044" S
Grid line DX 1	13	29° 43' 5.376" E	26° 20' 52.861" S
Grid line DX 1	14	29° 43' 3.357" E	26° 20' 54.266" S
Grid line DX 2	15	29° 43' 2.742" E	26° 20' 50.649" S
Grid line DX 2	16	29° 42' 49.907" E	26° 20' 40.520" S
Grid line DX 2	17	29° 42' 30.346" E	26° 21' 3.756" S
MTS	A	29° 42' 57.761" E	26° 20' 50.426" S
MTS	B	29° 42' 47.818" E	26° 21' 0.413" S
MTS	C	29° 42' 58.669" E	26° 21' 9.644" S
MTS	D	29° 43' 8.972" E	26° 20' 59.305" S
DX 1	E	29° 47' 52.439" E	26° 21' 17.980" S
DX 1	F	29° 47' 52.011" E	26° 21' 25.545" S
DX 1	G	29° 48' 2.259" E	26° 21' 25.543" S

	DX 1	H	29° 48' 2.671" E	26° 21' 17.985" S
	DX 2	I	29° 42' 25.356" E	26° 21' 1.107" S
	DX 2	J	29° 42' 21.627" E	26° 21' 5.972" S
	DX 2	K	29° 42' 30.555" E	26° 21' 10.975" S
	DX 2	L	29° 42' 34.276" E	26° 21' 6.448" S
	DX 3	M	29° 51' 2.345" E	26° 23' 45.483" S
	DX 3	N	29° 51' 10.084" E	26° 23' 48.785" S
	DX 3	O	29° 51' 14.840" E	26° 23' 41.870" S
	DX 3	P	29° 51' 6.764" E	26° 23' 38.258" S
Total Site Extent	Approximately 593.88 hectares (ha)			
Design Specifications				
Distribution or Transmission Capacity	Up to 400kV			
Up to 400kV transmission line	• Servitude width for 1 x up to 400kV transmission line is 60m for Loop-In-Loop-Out • Height of 1 x 400kV power line structure is on average 48m, but may reach up to 50m in exceptional circumstances depending on the complexity and slope of the terrain. • Minimum conductor clearance is between 8.1m and 12.6m. • Span length between pylon structures is typically up to 100 - 250m apart, depending on complexity and slope of terrain. • For up to 400kV structures footprint sizes may vary depending on design type up to 110m² (10.5m by 10.5m), with concrete foundations of up to 80m² and depths reaching up to 3.5m typically depending on the number and design of the foundations (to be determined during the detailed design engineering phase). • The actual number of structures required will vary according to the final route alignment determined. • Pylon structures will be either monopole or lattice structures depending on what is identified as appropriate during final design. • For safety reasons, transmission lines require certain minimum clearance distances. • These are as follows: • The minimum vertical clearance distance between the ground and the transmission line is 6.7m. • The minimum vertical clearance to any fixed structure that does not form part of the transmission line is 9.4m - 11m. • The minimum distance between an up to 400kV transmission line and an existing road is 60m – 120m (depending on the type of road). • Any farming activity can be practiced under the conductors provided that safe working clearances and building restrictions are adhered to.			
Up to 132kV transmission lines	• The servitude width for 1x up to 132kV transmission line is 31m. A 300m corridor must be assessed (150m on either side of the centre line) to allow for micro-siting.			

	In the case of the Loop-In-Loop-Out alternative this servitude will apply to each of the two connecting power lines. • The maximum height for an up to 132kV powerline structure is 40m. • Pylon structures will be either monopole or lattice structures depending what is identified as appropriate during final design. • Pylon structures may require anchors with guy-wires or be anchorless. • For up to 132kV structures, concrete foundation sizes may vary depending on design type up to 80m² (10m by 8m), with depths reaching up to 3.5m typically in a rectangular 'pad' shape. • A working area of approximately 100m x 100m is needed for each of the proposed structures to be constructed.
Main Transmission substation (MTS) (Approx. 36Ha)	• A high voltage substation yard to allow for multiple 132kV and 400kV feeder bays and transformers, with infrastructure to allow for step-up to 400kV as required. • Standard substation electrical equipment, including but not limited to transformers, busbars, office area, operation and control room, workshop, and storage area, feeder bays, transformers, busbars, stringer strain beams, insulators, isolators, conductors, circuit breakers, lightning arrestors, relays, capacitor banks, batteries, wave trappers, switchyard, metering and indication instruments, equipment for carrier current, surge protection and outgoing feeders, as may be needed. • The control building, telecommunication infrastructure, oil dam(s) etc, • Workshop and office area within the collector substation footprint (including conservancy tank to service ablution facilities), • Fencing around the Substation • All the access road infrastructure to and within the substation
Three Distribution Substations	• Dx1-approx.6.62Ha footprint • Dx2- approx.5.23Ha footprint • Dx3- approx.6.13Ha footprint
Temporary/ construction phase infrastructure	• Construction compound at the MTS (3ha) (site offices including conservancy tank for ablutions, stores, material laydown area, generator, fuel storage, etc.) • 3 x construction compound / laydown areas, including site office of 3ha each at each of the Dx locations (150m x 200m each) (including conservancy tank for ablutions) • Batch plant of 4-7 ha (unless a commercial source is used and concrete trucked to site, preferable to keep options open) • Portable ablution facilities will be used along the powerline routes

CONTENTS

TABLES

FIGURES

APPENDICES

APPENDIX E

APPROVED PRE-APPLICATION MEETING MINUTES

APPENDIX F

STAKEHOLDER ENGAGEMENT REPORT

APPENDIX G

SPECIALIST REPORTS

APPENDIX G.1

GEOTECHNICAL SCOPING REPORT

APPENDIX G.2

AQUATIC SCOPING REPORT

APPENDIX G.3

TERRESTRIAL BIODIVERSITY SCOPING REPORT

APPENDIX G.4

AVIFAUNAL SCOPING REPORT

APPENDIX G.5

VISUAL SCOPING REPORT

APPENDIX G.6

SOCIAL SCOPING REPORT

APPENDIX G.7

AGRICULTURAL SCOPING REPORT

APPENDIX G.8

HERITAGE SCOPING REPORT

APPENDIX H

SITE SENSITIVTY VERIFICATION

APPENDIX I

PROOF OF ADOPTION OF THE MBSP

1 INTRODUCTION

1.1 PURPOSE OF THIS REPORT

All changes and additions made in this report from the draft have been underlined.

This Final Scoping Report (FSR) documents the process and findings of the scoping phase of the Scoping and Environmental Impact Reporting (S&EIR) process for the proposed Phefumula Emoyeni One Electrical Grid Infrastructure, located approximately 16km north-west of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa.

The FSR aims to provide stakeholders with information on the proposed development including location, layout and technological alternatives, the scope of the environmental assessment and key impacts to be addressed in the environmental assessment, and the consultation process undertaken through the environmental impact assessment (EIA) process.

1.2 BACKGROUND INFORMATION

The proponent is proposing the development of the Phefumula Emoyeni One Electrical Grid Infrastructure in Mpumalanga. The project consists of the following infrastructure referred to as:

- One Main Transmission Substation (MTS) = this will tie into the existing 400kV line via loop in loop out (LILO) set-up with approximately 17.4Ha footprint;
- Three DX = Distribution substations (one per each phase). The independent power producer (IPP) substation will be constructed adjacent to the Dx substations; and
- Three overhead lines (OHL) = 132kV overhead power line from each Dx sub to the MTS (total length approx.18.2km)

The focus of this Final Scoping Report is the proposed Phefumula Emoyeni One Electrical Grid Infrastructure project.

The proposed project will be applied for under a Special Purpose Vehicle (SPV), and the Project Applicant is therefore Phefumula Emoyeni One (Pty) Ltd. The grid will be located over 10 farm portions.

In order for the proposed project to proceed, it will require an Environmental Authorisation (EA) from the Competent Authority (CA) (i.e., the National Department of Forestry, Fisheries and Environment, (DFFE)).

1.3 KEY ROLE PLAYERS

1.3.1 PROJECT PROPONENT

Phefumula Emoyeni One (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the grid connection and associated infrastructure. **Table 1-1** provides the relevant details of the project proponent.

Table 1-1 - Details of Project Proponent

Proponent:	Phefumula Emoyeni One (Pty) Ltd,
Company Registration No:	2013/165056/07
Contact Person:	Peter Carl Venn
Postal Address	PO Box 639, Northlands, Johannesburg, Gauteng, 2116
Telephone:	+27 83 689 3063
Email:	peter.venn@seritigreen.com

1.3.2 COMPETENT AUTHORITY

Section 24C(2)(a) of NEMA stipulates that the Minister of Forestry, Fisheries and the Environment ("the Minister") must be identified as the CA if the activity has implications for international environmental commitments or relations. GN 779 of 01 July 2016 identifies the Minister as the CA for the consideration and processing of environmental authorisations and amendments thereto for activities related to the Integrated Resource Plan (IRP) 2010 – 2030.

As the proposed WEF is related to the IRP, the CA is the Department of Forestry, Fisheries, and the Environment (DFFE), which was confirmed during the Pre-Application Meeting held on 24 October 2023. **Table 1-2** provides the relevant details of the competent authority on the Project.

Table 1-2 - Competent Authority

Aspect	Competent / Commenting Authority	Contact Details
Competent Authority: Environmental Authorisation	Department of Forestry, Fisheries, and the Environment	Case Officer: Mmamohale Kabasa Integrated Environmental Authorisations Email: MKabasa@dffe.gov.za Ref No: 14/12/16/3/3/2/2596

1.3.3 COMMENTING AUTHORITY

The following commenting authorities have been identified, to date, for this application:

- National Transmission Company South Africa (NTCSA);
- Mpumalanga Department Agriculture, Rural Development, Land and Environmental Affairs (MDARDLEA);
- DFFE: Biodiversity and Conservation;
- DFFE: Protected areas;
- Department of Water and Sanitation (DWS);
- Vaal Water Management Area (WMA) Authority;
- South African Heritage Resource Agency (SAHRA);
- Mpumalanga Heritage Resources Authority (MHRA);

- Mpumalanga Tourism and Parks Agency (MTPA);
- Civil Aviation Authority (CAA);
- Air Traffic and Navigation Services (ATNS);
- Department of Defence (SA Army) (DD);
- Astronomy Management Authority (AMA);
- South African Weather Services (SAWS);
- South African National Roads Agency Limited (SANRAL);
- Mpumalanga Department of Public Works, Roads and Transport;
- Gert Sibande District Municipality;
- Msukaligwa Local Municipality.

Refer to the Stakeholder Engagement Report (SER) in **Appendix F** for a full list of commenting authorities.

1.3.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

WSP Group Africa (Pty) Ltd (WSP) has been appointed in the role of Independent Environmental Assessment Practitioner (EAP) to undertake the S&EIR processes for the development of the Project. The CV of the EAP is available in **Appendix A**. The EAP declaration of interest and undertaking is included in **Appendix B**. **Table 1-3** details the relevant contact details of the EAP. In order to adequately identify and assess potential environmental impacts, a number of specialists will support the EAP.

Table 1-3 - Details of the Environmental Assessment Practitioner

Environmental Assessment Practitioner (EAP)	**WSP Group Africa (Pty) Ltd**
Contact Person:	Ashlea Strong
Postal Address:	Building 1, Maxwell Office Park, Magwa Cres, Midrand, 1685
Telephone:	011 361 1392
Fax:	011 361 1381
E-mail:	Ashlea.Strong@wsp.com
Qualifications:	Masters in Environmental Management, University of the Free State B Tech, Nature Conservation, Technikon SA National Diploma in Nature Conservation, Technikon SA
EAPASA Registration Number:	EAPASA (2019/1005)

Statement of Independence

Neither WSP nor any of the authors of this Report have any material present or contingent interest in the outcome of this Report, nor do they have any business, financial, personal, or other interest that could be reasonably regarded as being capable of affecting their independence. WSP has no beneficial interest in the outcome of the assessment.

1.3.5 SPECIALISTS

Specialist input was required in support of this application for EA. The details of the specialists are provided in **Table 1-4** below. The specialist declarations are included in **Appendix C**.

Table 1-4 - Details of Specialists

Assessment	Name of Specialist	Company	Sections in Report
Agriculture	Johann Lanz	Independent	Section 5.1.5 Section 6.1.2 Section 7.5.1 **Appendix G-8**
Avifauna	Albert Froneman	AfriAvian Environmental	Section 5.2.6 Section 6.1.7 Section 7.5.4 **Appendix G-4**
Aquatic Biodiversity	Stephen van Staden and Paul da Cruz	Scientific Aquatic Services (SAS) (Pty) Ltd	Section 5.1.6 Section 6.1.3 Section 7.5.3 **Appendix G-2**
Terrestrial Biodiversity (including Animal and Plant species themes)	Andrew Zinn	Hawkhead Consulting	Section 5.2.3 Section 6.1.6 Section 7.5.2 **Appendix G-3**
Geotechnical	Heather Davis	WSP Group Africa (Pty) Ltd	Section 5.1.4 Section 6.1.1 Section 7.5.7 Appendix G-1
Heritage and Palaeontology	Jaco van der Walt	Beyond Heritage Consulting	Section 5.3.2 Section 6.1.9 Section 7.5.5 **Appendix G-11**
Socio-economic	Stephen Horak	WSP Group Africa (Pty) Ltd	Section 5.3.5 Section 6.1.11 Section 7.5.8 **Appendix G-7**

Assessment	Name of Specialist	Company	Sections in Report
Visual	Johan Bothma	WSP Group Africa (Pty) Ltd	Section 5.3.4 Section 6.1.8 Section 7.5.6 **Appendix G-6**

1.4 SCOPING TERMS OF REFERENCE

The 2014 Environmental Impact Assessment (EIA) Regulations (GNR 982), as amended, identifies the proposed Phefumula Emoyeni One electrical grid infrastructure development as an activity being subject to an S&EIR process due to the applicability of the EIA Listing Notices 1 and 2 (GNR 983 and 984, as amended).

As defined in Appendix 2 of GNR 982, as amended, the objective of the scoping process is to, through a consultative process:

- Identify the relevant policies and legislation relevant to the activity;
- Motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
- Identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
- Identify the key issues to be addressed in the assessment phase;
- Agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
- Identify suitable measures to avoid, manage or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

Public participation is a requirement of scoping; it consists of a series of inclusive interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIR decision-making process. Effective public participation requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the Proposed Project. The objectives of the public participation process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the Proposed Project;
- Clearly outline the scope of the proposed Project, including the scale and nature of the existing and proposed activities;

- Identify viable proposed Project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the subsequent specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the Proposed Project, issues and solutions.

1.5 SCOPING REPORT STRUCTURE

Table 1-5 cross-references the sections within this FSR with the legislated requirements as per Appendix 2 of GNR 982.

Table 1-5 - Legislated Report Requirements as detailed in GNR 982

Appendix 2	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
(a)	Details of	
	the EAP who compiled the report; and	Section 1.3.4 and Appendix A
	the expertise of the EAP, including a Curriculum Vitae	Appendix A
(b)	The location of the activity, including-	
	The 21-digit Surveyor code for each cadastral land parcel;	Section 3.1
	Where available, the physical address and farm name	Section 3.1
	Where the required information in terms of (i) and (ii) is not available, the coordinates of the boundary of the property.	N/A
(c)	A plan which locates the proposed activities applied for at an appropriate scale, or, if it is-	
	A linear activity, a description of the corridor in which the proposed activity or activities is to be undertaken; or	N/A
	On land where the property has not been defined, the coordinates within which the activity is to be undertaken.	N/A
(d)	A description of the proposed activity, including-	
	All listed and specified activities triggered;	Section 3.1
	A description of the activities to be undertaken, including associated structures and infrastructure;	Section 4
(e)	A description of the policy and legislative context within which the development is proposed including an identification of all legislation,	Section 4.2

Appendix 2	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
	policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	
(f)	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 3.6
(g)	A full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including-	
	Details of all the alternatives considered;	Section 3.5
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 4.6
	a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Appendix E
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 5
	the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 6
	the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 2.5
	positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6.3
	the possible mitigation measures that could be applied and level of residual risk;	Section 6.3
	the outcome of the site selection matrix;	Section 2.5
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A

Appendix 2	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 3.5
(h)	A full description of the process followed to reach the proposed preferred activity, site and location within the site, including-	
	Details of all the alternatives considered;	Section 3.4
	Details of the public participation undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 2.6
	a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	**Appendix F**
	the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 5
	the impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 6
	the methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 2.5
	positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 6
	the possible mitigation measures that could be applied and level of residual risk;	Section 6
	the outcome of the site selection matrix;	Section 2.4
	if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such and	N/A
	a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 2.4
(i)	A plan of study for undertaking the environmental impact assessment process to be undertaken, including-	

Appendix 2	Legislated requirements as per the NEMA GNR 982	Relevant Report Section
	a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	Section 7.3
	a description of the aspects to be assessed as part of the environmental impact assessment process;	Section 7.4
	aspects to be assessed by specialists;	Section 7.5
	a description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;	Section 7.6
	a description of the proposed method of assessing duration and significance;	Section 7.7
	an indication of the stages at which the competent authority will be consulted;	Section 2.6
	particulars of the public participation process that be conducted during the environmental impact assessment process; and	Section 7
	a description of the tasks that will be undertaken as part of the environmental impact assessment process;	Section 7
	identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	Section 6
(j)	An undertaking under oath or affirmation by the EAP in relation to-	
	the correctness of the information provided in the report;	**Appendix B**
	the inclusion of comments and inputs from stakeholders and interested and affected parties; and	
	any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	
(k)	An undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	**Appendix B**
(l)	Where applicable, any specific information required by the competent authority; and	N/A
(m)	Any other matter required in terms of section 24(4)(a) and (b) of the Act.	N/A

2 S&EIR PROCESS

2.1 S&EIR PROCESS AND PHASING

The S&EIR process consists of various phases with associated timelines as defined in GNR 982. The process can generally be divided into four main phases, namely; (i) a Pre-application Phase, (ii) an Application and Scoping Phase (current phase), (iii) an Impact Assessment Phase and (iv) Authorisation and Appeal Phase. The S&EIR process is shown in **Figure 2-1**

The main objectives of the phases can be described as follows:

Pre-Application Phase (Complete):

- Undertake consultation meetings with the relevant authorities to confirm the required process, the general approach to be undertaken and to agree on the public participation plan; and
- Identify stakeholders, including neighbouring landowners/residents and relevant authorities.

Application and Scoping Phase (Current):

- Compile and submit application forms to the CA and pay the relevant application fees;
- Compile a FSR describing the affected environment and present an analysis of the potential environmental issues and benefits arising from the proposed project that may require further investigation in the Impact Assessment Phase;
- Develop draft terms of reference for the specialist studies to be undertaken in the Impact Assessment Phase;
- Inform stakeholders of the proposed project, feasible alternatives and the S&EIR process and afford them the opportunity to register and participate in the process and identify any issues and concerns associated with the proposed project;
- Incorporate comments received from stakeholders during the DSR comment period;
- Should significant amendments be required, release the updated DSR for a 30-day comment period to provide stakeholders with the opportunity to review the amendments as well as provide additional input if required; and
- Submit the Final Scoping Report (FSR), following the consultation period, to the relevant authorities, in this case the DFFE, for acceptance/rejection (this report).

Impact Assessment Phase (Not Yet Applicable):

- Continue to inform and obtain contributions from stakeholders, including relevant authorities, stakeholders, and the public and address their relevant issues and concerns;
- Assess in detail the potential environmental and socio-economic impacts of the project as defined in the DSR and FSR;
- Identify environmental and social mitigation measures to avoid and/or address the identified impacts;
- Develop and/or amend environmental and social management plans based on the mitigation measures developed in the Environmental Impact Assessment Report (EIAR);
- Incorporate comments received from stakeholders during the DEIR comment period; and

- Submit the Final EIAR and the associated EMPr to the CA to undertake the decision making process.

Authorisation and Appeal Phase (Not Yet Applicable):

- The DFEE to provide written notification of the decision to either grant or refuse EA for the proposed project; and
- Notify all registered stakeholders of the decision and right to appeal.

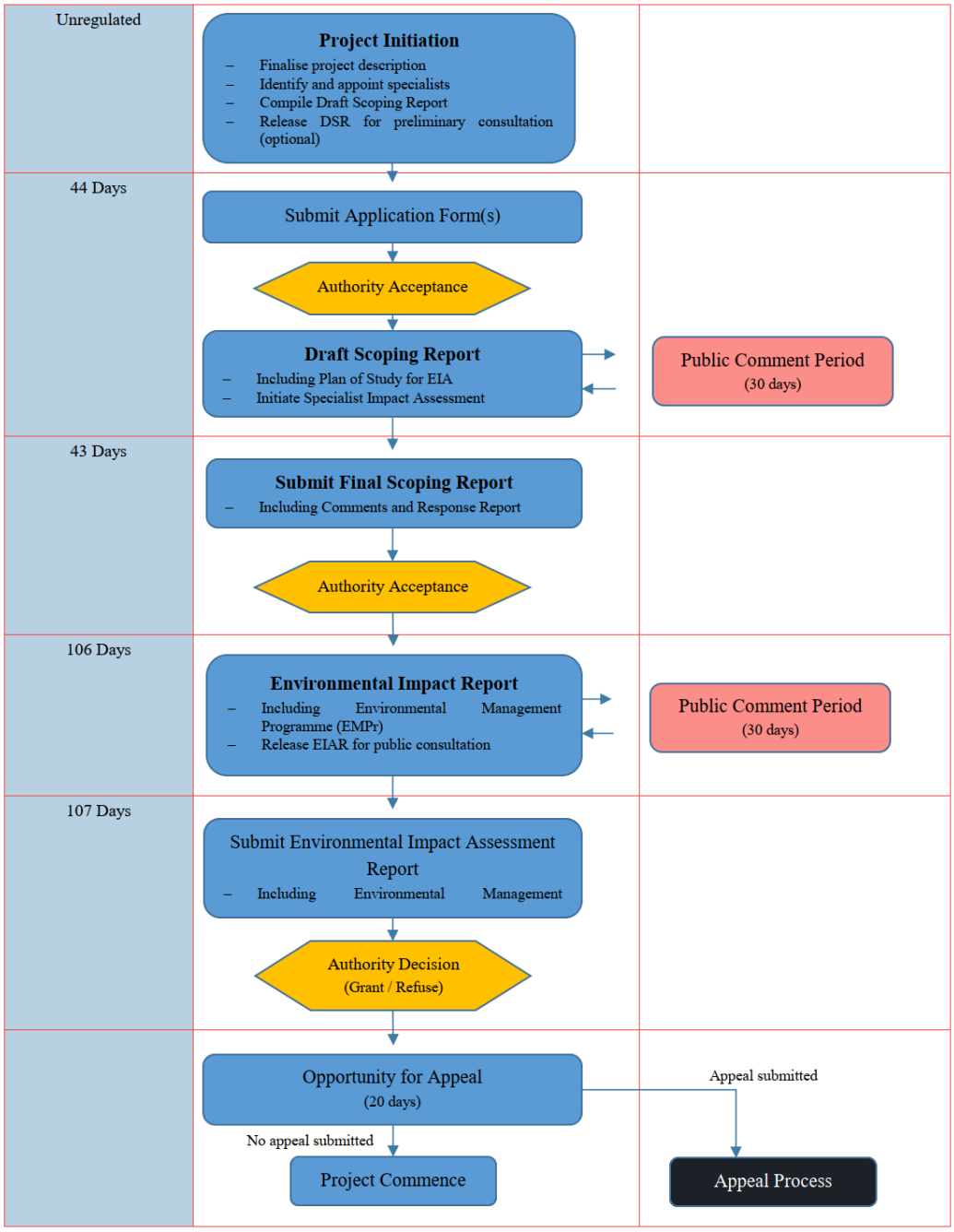


Figure 2-1: S&EIR Process

2.2 DFFE WEB-BASED ENVIRONMENTAL SCREENING TOOL

DFFE has developed the National Web-based Environmental Screening Tool in order to flag areas of potential environmental sensitivity related to a site as well as a development footprint and produces the screening report required in terms of regulation 16 (1)(v) of the EIA Regulations (2014, as amended). The Notice of the requirement to submit a report generated by the national web-based environmental screening tool in terms of section 24(5)(h) of the NEMA, 1998 (Act No 107 of 1998) and regulation 16(1)(b)(v) of the EIA regulations, 2014, as amended (GN 960 of July 2019) states that the submission of a report generated from the national web-based environmental screening tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations, 2014, published under Government Notice No. R982 in Government Gazette No. 38282 of 4 December 2014, as amended, is compulsory when submitting an application for environmental authorisation in terms of regulation 19 and regulation 21 of the EIA Regulations, 2014 as of 04 October 2019.

The Screening Report generated by the National Web-based Environmental Screening Tool contains a summary of any development incentives, restrictions, exclusions, or prohibitions that apply to the proposed development footprint as well as the most environmentally sensitive features on the footprint based on the footprint sensitivity screening results for the application classification that was selected.

A screening report for the proposed Phefumula Emoyeni One electrical grid infrastructure was generated on 18 June 2024 and is attached as **Appendix D**. The Screening Report for the project identified various sensitivities for the site. The report also generated a list of specialist assessments that should form part of the EIA based on the development type and the environmental sensitivity of the site. Assessment Protocols in the report provide minimum information to be included in a specialist report to facilitate decision-making.

The Site Sensitivity Verification Report has been included in **Appendix H**.

Table 2-1 below provides a summary of the sensitivities identified for the development footprint.

Table 2-1: Sensitivities identified in the screening report.

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agricultural Theme		✓		
Animal Species Theme		✓		
Aquatic Biodiversity Theme	✓			
Archaeological and Cultural Heritage Theme				✓
Civil Aviation Theme			✓	
Defence Theme				✓

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Palaeontology Theme	✓			
Plant Species Theme			✓	
Terrestrial Biodiversity Theme	✓			

Based on the selected classification, and the environmental sensitivities of the proposed development footprint, the following list of specialist assessments have been identified for inclusion in the assessment report as determined by the screening tool (please refer to Section 2.2.1 below for the EAP motivation applicable to this list):

- Agricultural Impact Assessment
- Archaeological and Cultural Heritage Impact Assessment
- Palaeontology Impact Assessment
- Landscape/Visual Impact Assessment
- Terrestrial Biodiversity Impact Assessment
- Aquatic Impact Assessment
- Avifauna Impact Assessment
- Geotechnical Assessment
- Civil Aviation Impact Assessment
- RFI Assessment
- Plant Species Assessment
- Animal Species Assessment

2.2.1 MOTIVATION FOR SPECIALIST STUDIES

The report recognises that “it is the responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study including the provision of photographic evidence of the footprint situation.”

As summarised in **Table 2-1** above, the following specialist assessments have been commissioned for the project based on the environmental sensitivities identified by the Screening Report:

- Soils and Agricultural Potential Assessment;
- Archaeological and Cultural Heritage Assessment;
- Palaeontology Impact Assessment;
- Visual Impact Assessment;
- Biodiversity Impact Assessment (inclusive of terrestrial biodiversity, plant species and animal species);
- Aquatic Assessment;
- Avifauna Impact Assessment;
- Social Impact Assessment;
- Desktop Geotechnical Assessment.

Four of the identified specialist studies will not be undertaken as part of the S&EIA process for the proposed Phefumula Emoyeni One electrical grid infrastructure. Motivation for the exclusion of these specialist studies is provided below:

Detailed Geotechnical

- A desktop Geotechnical Assessment has been commissioned and has been incorporated into this FSR. However, a detailed Geotechnical Assessment will not be undertaken as part of the S&EIA Process as this will be undertaken during the detailed design phase.

RFI Assessment

- A Radio Frequency Interference (RFI) Study will not be undertaken. The proposed development area is not located within any Astronomy Advantage Area. Square Kilometre Array (SKA) South Africa as well as the South African Radio Astronomy Observatory (SARAO) will be engaged with as part of the Public Participation Process. The EAP will provide a compliance statement for this theme.

Civil Aviation

- According to the DFFE Screening Tool Report, civil aviation is regarded as having medium sensitivity. The proposed development site is located between 8 and 15 km of civil aviation aerodromes. The required Civil Aviation Compliance Statement will be included as part of the EIA Phase. The relevant Authorities will be included on the project stakeholder database. An Application for the Approval of Obstacles will also be submitted to Air Traffic and Navigation Services (ATNS), where applicable. The South African Civil Aviation Authority (SACAA) will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable. The EAP will provide a compliance statement for this theme.

Defence

- The Department of Defence will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from this authority as applicable. The EAP will provide a compliance statement for this theme.

2.3 APPLICATION FOR ENVIRONMENTAL AUTHORISATION

The application phase consists of the completion of the appropriate application form by the EAP and the Proponent as well as the subsequent submission and registration of the application for EA with DFFE. The application to the DFFE was submitted on the **26 July 2024.** The DFFE confirmed receipt of the application on **29 July 2024** and allocated the following reference number to the application - **14/12/16/3/3/2/2596**

A request for a pre-application meeting was submitted to DFFE on 20 May 2023. A virtual pre-application meeting was held on 24 October 2023 with the DFFE to discuss the proposed Phefumula Emoyeni One WEF and electrical grid infrastructure. The minutes of the meeting and the public participation plan were approved on 07 December 2023 respectively and are included in **Appendix E.**

2.4 BASELINE ENVIRONMENTAL ASSESSMENT

The description of the baseline environment has been compiled through a combination of site investigations, desktop reviews, georeferenced data and information obtained from the specialist assessments. An understanding of the receiving environment is critical in order to identify aspects that may be affect by the project and in turn how the surrounding environment may affect project design considerations.

2.5 IMPACT SCREENING METHODOLOGY

The potential impacts associated with the proposed development were determined at both a desktop level based on existing information, as well as the field assessment. The following methodology was used:

- Identify potential sensitive environments and receptors that may be impacted on by the proposed development;
- Identify the type of impacts that are most likely to occur (including cumulative impacts);
- Determine the nature and extent of the potential impacts during the various developmental phases, including, construction, operation and decommissioning;
- Identify potential No-Go areas (if applicable); and
- Summarise the potential impacts that will be considered further in the EIA phase through detailed specialist studies.

Appendix 2 of GNR 982, as amended, requires the identification of the significance of potential impacts during scoping. To this end, an impact screening tool has been used in the scoping phase. The screening tool is based on two criteria, namely probability; and consequence (**Table 2-2**), where the latter is based on general consideration to the intensity, extent, and duration.

The scales and descriptors used for scoring probability and consequence are detailed in **Table 2-3** and **Table 2-4** respectively.

Table 2-2: Significance Screening Tool

	Consequence Scale				
Probability Scale		1	2	3	4
	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 2-3: Probability Scores and Descriptors

Score	Descriptor
4	Definite: The impact will occur regardless of any prevention measures

Score	Descriptor
3	Highly Probable: It is most likely that the impact will occur
2	Probable: There is a good possibility that the impact will occur
1	Improbable: The possibility of the impact occurring is very low

Table 2-4: Consequence Score Descriptions

Score	Negative	Positive
4	Very severe: An irreversible and permanent change to the affected system(s) or party(ies) which cannot be mitigated.	Very beneficial: A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe: A long term impact on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial: A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe: A medium to long term impact on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial: A medium to long term impact of real benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	Negligible: A short to medium term impact on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.	Negligible: A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.

The nature of the impact must be characterised as to whether the impact is deemed to be positive (+ve) (i.e. beneficial) or negative (-ve) (i.e. harmful) to the receiving environment/receptor. For ease of reference, a colour reference system (**Table 2-5**) has been applied according to the nature and significance of the identified impacts.

Table 2-5: Impact Significance Colour Reference System to Indicate the Nature of the Impact

Negative Impacts (-ve)	Positive Impacts (+ve)
Negligible	Negligible
Very Low	Very Low
Low	Low

Negative Impacts (-ve)	Positive Impacts (+ve)
Medium	Medium
High	High
Very high	Very high

2.6 STAKEHOLDER ENGAGEMENT

Stakeholder engagement (public participation) is a requirement of the S&EIA process. It consists of a series of inclusive and culturally appropriate interactions aimed at providing stakeholders with opportunities to express their views, so that these can be considered and incorporated into the S&EIA decision-making process. Effective engagement requires the prior disclosure of relevant and adequate project information to enable stakeholders to understand the risks, impacts, and opportunities of the proposed project. The objectives of the stakeholder engagement process can be summarised as follows:

- Identify relevant individuals, organisations and communities who may be interested in or affected by the proposed project;
- Clearly outline the scope of the proposed project, including the scale and nature of the existing and proposed activities;
- Identify viable proposed project alternatives that will assist the relevant authorities in making an informed decision;
- Identify shortcomings and gaps in existing information;
- Identify key concerns, raised by Stakeholders that should be addressed in the specialist studies;
- Highlight the potential for environmental impacts, whether positive or negative; and
- To inform and provide the public with information and an understanding of the proposed project, issues, and solutions.

It is important to note that since the proposed individual projects associated with the Phefumula Emoyeni One Facility, subject to a S&EIA Process, are located within the same geographical area, an integrated stakeholder engagement process (public participation) will be undertaken for these projects. A Stakeholder Engagement Report (SER) has been compiled and included in the FSR (**Appendix F**) detailing the projects' compliance with Chapter 6 of the NEMA EIA Regulations 2014, as amended.

2.6.1 STAKEHOLDER IDENTIFICATION

Stakeholders were identified and will continue to be identified through several mechanisms. These include:

- Utilising existing databases from other projects in the area;
- Networking with local business owners, non-governmental agencies, community based organisations, and local council representatives;
- Field work in and around the project area;
- Advertising in the press;

- Placement of community notices;
- Completed comment sheets; and
- Attendance registers at meetings.

All Stakeholders identified to date have been registered on the project stakeholder database. The EAP endeavoured to ensure that individuals/organisations from referrals and networking were notified of the Proposed Project. Stakeholders were identified at the horizontal (geographical) and vertical extent (organisations level).

A list of stakeholders captured in the project database is included in Appendix A of the SER (**Appendix F**).

2.6.2 STAKEHOLDER NOTIFICATION

Direct Notification

Notification of the proposed Project was issued to potential Stakeholders, via direct correspondence (i.e., e-mail) on **12 April 2024**. The notification letter that was circulated is included in Appendix B-3 of the SER (**Appendix F**). Proof of notification is included in Appendix B of the SER (**Appendix F**). Further SMS and email notifications were sent to registered Stakeholders to notify them of the availability of the DSR for public review on **26 July 2024.** Proof of these additional notifications is included in Appendix B the FSR (**Appendix F).**

Newspaper Advertisements

In accordance with the requirements of GNR 982, as amended, the proposed project was advertised in two local newspapers. The purpose of the advertisement was to notify the public about the proposed project and to invite them to register as stakeholders. A copy of the advertisements is included in Appendix B-1 of the SER (**Appendix F**). The relevant advertisement dates are listed in **Table 2-6**.

Table 2-6: Dates on which the Adverts were published

Newspaper	Publication Date	Language
The Star	11 April 2024	English
Highvelder	11 April 2024	Afrikaans and Zulu

Site Notices

The official site notices were erected as per GNR 982, as amended, on the boundary fence of the proposed site. In addition, general project notices, announcing the Proposed Project and inviting stakeholders to register, were placed at various locations in and around the project area. A copy of the site notice is included in Appendix B-2 of the SER (**Appendix F**).

2.6.3 PUBLIC REVIEW

The DSR was placed for public review for a period of 30 days from **26 July 2024 to 30 August 2024,** at the following public places:

- Ermelo Public Library;

- Thusiville Public Library
- Hendrina Public Library
- Bethal Public Library
- WSP website (https://www.wsp.com/en-ZA/services/public-documents).
- Data free website (https://wsp-engage.com/)

This FSR, inclusive of all comments and responses received, will be submitted to the DFFE for approval.

2.6.4 COMMENT AND RESPONSE REPORT

All concerns, comments, viewpoints, and questions (collectively referred to as 'issues') received during the comment period have been documented and responded to adequately in the SER which is included in this FSR. Where comments are project specific, this will be noted in the Comments and Response section of the SER (**Appendix F**). This will record the following:

- List of all issues raised;
- Record of who raised the issues;
- Record of where the issues were raised;
- Record of the date on which the issue was raised; and
- Response to the issues.

2.6.5 WAY FORWARD

Final Scoping Report Submission

All issues raised during the scoping phase of the proposed project have been incorporated into this FSR and will be addressed during the EIR Phase.

The DFFE will be allocated 43 days to review the FSR. This FSR will be placed on stakeholder review for a reasonable time period during the DFFE's final review and decision-making process. The delegated CA must within this specified timeframe issue a decision on whether to proceed onto the next phase, the EIR phase.

Ongoing Consultation and Engagement

In addition to the public documents distributed to stakeholders, there will be ongoing communication between the proponent, the EAP and stakeholders throughout the S&EIR process. These interactions include the following:

- In addition to the project announcement letters, a letter will be sent out to all registered stakeholders providing them with an update of the proposed project once the FSR has been approved;
- Interactions with stakeholders will take place in English and Afrikaans;
- Feedback to stakeholders, individually and collectively;
- Written responses (email, faxes or letters) will be provided to stakeholders acknowledging issues and providing information requested (dependent on availability); and
- As per the GNR 982, as amended, particular attention will be paid to landowners, and neighbouring communities, specifically where literacy levels and language barriers may be an issue.

2.7 ASSUMPTIONS AND LIMITATIONS

General assumptions and limitations:

- The EAP hereby confirms that they have undertaken to obtain project information from the client that is deemed to be accurate and representative of the project;
- Site visits have been undertaken to better understand the project and ensure that the information provided by the client is correct, based on site conditions observed;
- The EAP hereby confirms their independence and understands the responsibility they hold in ensuring all comments received are accurately replicated and responded to within the EIA documentation;
- The comments received in response to the public participation process, will be representative of comments from the broader community; and
- Based on the Pre-Application meeting and subsequent minutes, the CA would not require additional specialist input, in order to make a decision regarding the application.

Terrestrial Biodiversity (inclusive of Flora and Fauna):

The following assumptions, limitations, uncertainties are listed regarding the terrestrial (inclusive of Fauna and Flora) ecological assessment of the Phefumula Emoyeni One site:

- With respects to the flora field surveys, it is possible that certain small or cryptic taxa (e.g., annuals and geophytes) that are most readily visible or distinguishable (e.g., when flowering) at other periods during the wet/growing season, may not have been detected during the field survey;
- Similarly, with respects to the fauna survey, it is possible that certain rare, cryptic, migrating, hibernating or transient fauna species may not have been present and/or observed during the field work. The absence or non-recording of a specific fauna species, at a particular time, does not necessarily indicate that 1) the species does not occur there; 2) the species does not utilise resources in that area; or 3) the area does not play an ecological support role in the ecology of that species;
- Given the difficulty of fully sampling and characterising the abundance and distribution of fauna species in the study area during the period of time allocated to field work, the baseline descriptions were qualitative; and
- The preliminary identification of potential impacts and mitigation measures focuses on those fauna and flora SCC that were observed or are likely to occur in the study area, as determined based on collected field data, existing data records and documented distribution ranges.

Avifauna:

This study assumed that the sources of information used in this report are reliable. In this respect, the following must be noted:

- The SABAP2 data are regarded as an adequate indicator of the avifauna which could occur in the Project area, and it was further supplemented by data collected during the on-site surveys.
- The focus of the study was on the potential impacts of the proposed EGI on EGI sensitive bird species.

- EGI sensitive species were defined as follows: Species which could potentially be impacted by power line collisions or electrocutions (power line or substation yard), based on specific morphological and/or behavioural characteristics. Species classes which fall under the EGI sensitive category are raptors, large terrestrial birds, waterbirds, crows, and certain ground nesting birds (vulnerable to displacement due to disturbance/habitat loss).
- Despite the growing body of peer reviewed literature investigating the collision risks of birds with overhead power lines in South Africa, relevant information for many individual species remains limited. The precautionary principle was therefore applied throughout. The World Charter for Nature, which was adopted by the UN General Assembly in 1982, was the first international endorsement of the precautionary principle. The principle was implemented in an international treaty as early as the 1987 Montreal Protocol and, among other international treaties and declarations, is reflected in the 1992 Rio Declaration on Environment and Development. Principle 15 of the 1992 Rio Declaration states that: “to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall be not used as a reason for postponing cost-effective measures to prevent environmental degradation.”
- The assessment of impacts is based on the baseline environment as it currently exists at the Project area.
- Conclusions drawn in this study are based on experience of the specialists on the species found on site and similar species in different parts of South Africa. Bird behaviour can never be entirely reduced to formulas that will be valid under all circumstances.
- The Broader Area is defined as the area encompassed by the 12 SABAP2 pentads where the project is located.
- The Project Area of Impact is defined as the area within a 2km radius of the EGI where the primary impacts on avifauna are expected.
- The Project Site is the where the actual development will be located, i.e., the footprint containing the EGI.

Agriculture and Soil:

- There are no assumptions and limitations associated with this study at this time.

Social:

- There are no assumptions and limitations associated with this study at this time.

Heritage and Palaeontology:

The following assumptions and limitations apply to this assessment:

- The authors acknowledge that the brief literature review is not exhaustive of the literature of the area.
- Due to the nature of heritage resources and pedestrian surveys, the possibility exists that some features or artefacts may not have been discovered/recorded and the possible occurrence of graves and other cultural material cannot be excluded. This limitation is successfully mitigated with the implementation of a Chance Find Procedure (CFP) and monitoring of the study area by the Environmental Control Officer (ECO).

- The report only deals with the footprint area of the proposed development and consisted of non-intrusive surface surveys.
- Field data were recorded by handheld GPS and Mobile GPS applications. It must be noted that during the process of converting spatial data to final drawings and maps the accuracy of spatial data may be compromised. Printing or other forms of reproduction might also distort the spatial distribution in maps. Due care has been taken to preserve accuracy.
- The study did not assess the impact on medicinal plants and intangible heritage as it is assumed that these components would be highlighted through the public consultation process if relevant.
- It is possible that new information could come to light in future, which might change the results of the scoping report.

Aquatic:

The following assumptions and limitations are applicable to this report:

- All freshwater ecosystems associated with the proposed Phefumula Emoyeni One Electrical Grid Infrastructure study area and within 500 m in fulfilment of GN4167, were delineated using various desktop methods including the use of topographic maps, digital satellite imagery, and aerial photographs. Desk-based delineations were subject to limited ground-truthing where feasible which allowed for refinement of the delineations of the freshwater ecosystems upon completion of the freshwater assessment;
- No tower / pylon positions have been provided for assessment. These will be assessed in the EIA phase, if available;
- A separate scoping-phase report for the WEF components has been produced (SAS, 2024). This report only covers the Grid Connection-related aspects of the proposed project; Global Positioning System (GPS) technology is inherently inaccurate and some inaccuracies due to the use of handheld GPS instrumentation may occur. If more accurate assessments are required, the freshwater ecosystems will need to be surveyed and pegged according to surveying principles and with survey equipment;
- The delineations as presented in the report are regarded as the best estimate of the boundaries based on desk-based delineation with limited ground truthing based on the site conditions present during the scoping-phase site assessment;
- The grid connection layout was not available to specialists when the scoping-phase site assessment was undertaken in October 2023. This entails that limited parts of the Electrical Grid Infrastructure study area were assessed in the field, but verification of other freshwater ecosystems in the study area was extrapolated to assist the delineation and characterisation of freshwater ecosystems in the Electrical Grid Infrastructure study and investigation areas;
- Wetland, riparian, and terrestrial ecosystem zones create transitional areas where an ecotone is formed as vegetation species change from terrestrial to obligate/facultative species. Within this transition zone, some variation of opinion on the freshwater ecosystem boundary may occur. However, if the DWAF (2008) method is followed, all assessors should get largely similar results;
- With regards to data sources used to provide background information on the sensitivity of the assessed areas, it is important to note that although all data sources provide useful and often

verifiable, high-quality data, the various databases used do not always provide an entirely accurate indication of the proposed Phefumula Emoyeni One electrical grid infrastructure's actual site characteristics at the scale required to inform the environmental authorisation and water use authorisation processes;
- With ecology being dynamic and complex, certain aspects (some of which may be important) may have been overlooked. However, it is expected that the existing activities have been accurately assessed and considered, based on the field observations and the consideration of existing studies and monitoring data in terms of aquatic, riparian, and wetland ecology; and
- The only activities which were assessed were the Phefumula Emoyeni One Electrical Grid Infrastructure and identified freshwater ecosystems within 500 m thereof that may be impacted by the development footprint. All other activities located outside these boundaries that may intercept/create other potential impacts were not considered.

Geotechnical:

- The statements presented in the report are intended to advise you of what your realistic expectations of the report should be, and to present the recommendations on how to minimize the risks associated with the groundworks for this project.
- The report is not intended to reduce the level of responsibility accepted by WSP, but rather to ensure that all parties who may rely on the report are aware of the responsibilities each assumes in so doing.

Visual:

The following qualification is relevant to the field of VIA and the findings of the study:

- The layout of individual project components, specifically the locations of individual pylons and other vertical infrastructure, and temporary impacts such as batching plants have not been determined/finalised yet, and the findings of this VIA are based on the available preliminary development description. Initial recommendations regarding the location of specific project infrastructure, including potential "no-go" areas, visual impacts associated with the project and proposed mitigation measures as included in this report, are therefore preliminary in nature and will be revised and updated during the impact assessment phase.
- Similarly, selection of specific technology has not been finalised in all instances. However, in most cases the specific choice of technology is not expected to materially influence the findings of the impact assessment, as the overall alignment of transmission line is expected to be the most determining factor during the visual impact assessment.
- Artificial landforms and structures, such as berms, stockpiles, buildings, and even tall vegetation will all impact the level of visibility of individual project components. However, given the limited development within the study area the influence of these elements during the viewshed analysis to be conducted during the impact assessment phase is expected to be limited.
- Determining the value, quality and significance of a visual resource or the significance of the visual impact that any activity may have on it, in absolute terms, is not achievable. The value of a visual resource is partly determined by the viewer and is influenced by that person's socio-economic, cultural, and individual background, and is even subject to fluctuating and intangible factors, such as emotional mood and appreciation of "sense of place".

- This situation is compounded by the fact that the conditions under which the visual resource is viewed can change dramatically due to natural phenomena, such as weather conditions and seasonal change. Visual impact cannot therefore be measured simply and reliably, as is for instance the case with water, noise, or air pollution.
- It is therefore not possible to conduct a visual assessment without relying to some extent on the expert opinion of a qualified consultant, which is inherently subjective. The subjective opinion of the visual consultant is however unlikely to materially influence the findings and recommendations of this study, as a wide body of scientific knowledge exists in the industry of VIA, on which findings are based.
- The graphic representation of any infrastructure to follow during impact assessment will be conceptual in nature only and is meant to illustrate the visual appearance of the project development, rather that convey technical or engineering aspects of the project. The locations of individual elements within the landscape will be approximate only, based on the preliminary layout, and may be further adjusted based on the final project layout. The appearance of the individual infrastructure components may differ from what is depicted based on specific technology and other factors.

Notwithstanding these assumptions and limitations, it is the view of WSP that this FSR provides a good description of the issues associated with the project, and a reasonable plan of study for the EIA phase.

3 PROJECT DESCRIPTION

This section provides a description of the location of the project area and the site location alternatives considered for the project. The descriptions encompass the activities to be undertaken during the construction and operational phases as well as the consideration for site accessibility, water demand, supply, storage, and site waste management. This section also considers the need and desirability of the project in accordance with Appendix 1 of GNR 326.

3.1 SITE LOCATION

The proposed Phefumula Emoyeni One electrical grid infrastructure (including MTS and substations) will have a project area of approximately 593.88 hectares (ha). Within this project area the extent of the buildable area will be subject to finalization based on technical and environmental requirements. A 300m corridor (150m on either side of centre line of the overhead line) will be assessed.

The proposed Phefumula Emoyeni One electrical grid infrastructure is located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa (**Figure 3-1**).

The details of the property associated with the proposed Phefumula Emoyeni One electrical grid infrastructure, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in **Table 3-1** - Phefumula Emoyeni One up to electrical grid infrastructure Affected Farm Portions. There are 10 affected farm portions. The co-ordinates of the cadastral land parcels are included in **Table 3-2**.

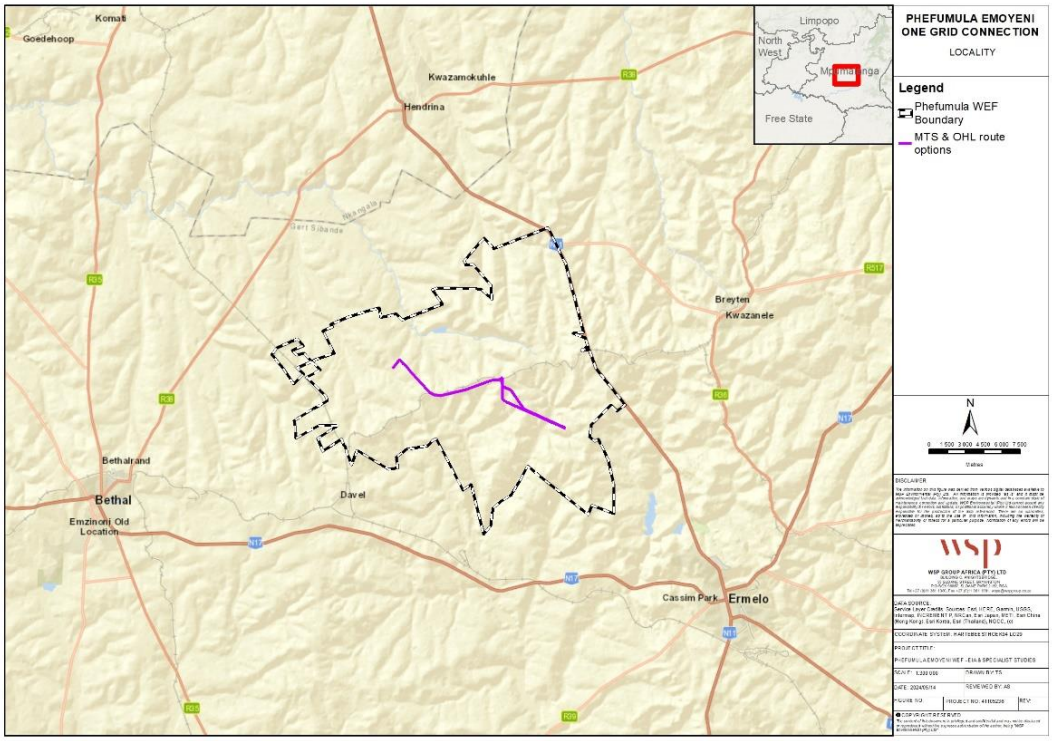
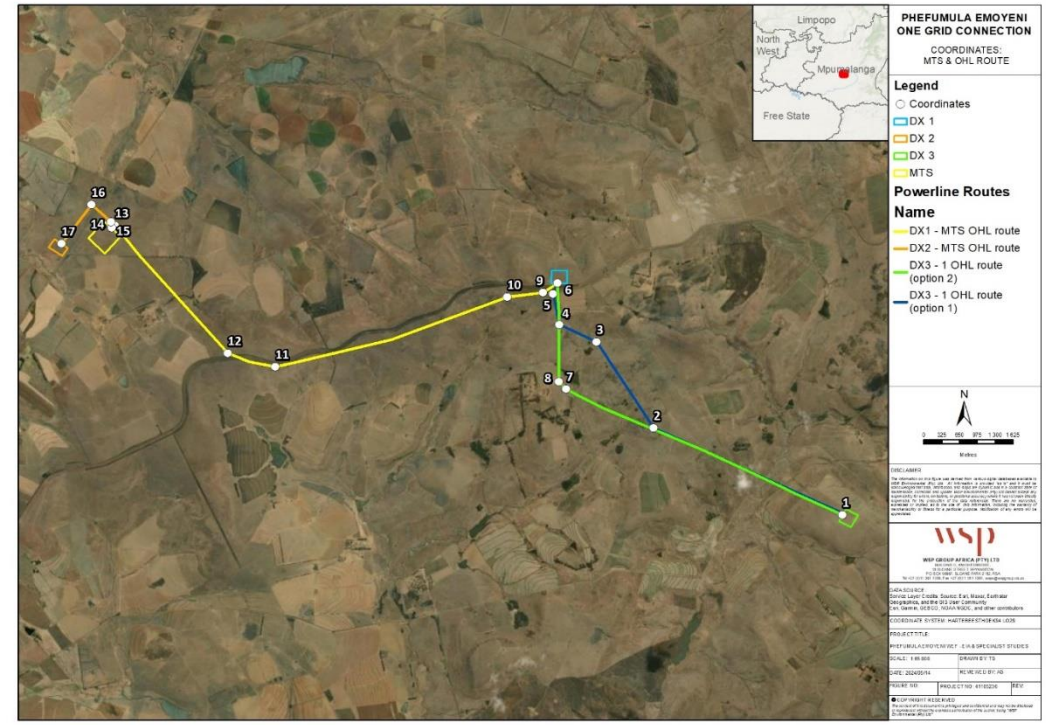


Figure 3-1 - Phefuluma Emoyeni One WEF Locality Map

Table 3-1 - Phefumula Emoyeni One up to electrical grid infrastructure Affected Farm Portions

Farm Name and Number	Portion	21 Digit Surveyor General Code of Each Cadastral Land Parcel
Kranspoort 248 IS	3	T0IS00000000024800003
Tweefontein 249 IS	9	T0IS00000000024900009
Tweefontein 249 IS	2	T0IS00000000024900002
Voorzorg 250 IS	0	T0IS00000000025000000
Witbank No. 236 IS	2	T0IS00000000023600002
Witbank No. 236 IS	5	T0IS00000000023600005
Nooitgedacht 251 IS	0	T0IS00000000025100000
Nooitgedacht 237 IS	4	T0IS00000000023700004
Kranspoort 248 IS	23	T0IS00000000024800023
Middelplaat 271 IS	8	T0IS00000000027100008

Table 3-2 - Co-ordinate Points of the electrical grid infrastructure OHPL routes

Point	Longitude	Latitude
		
1	29° 51' 4.547" E	26° 23' 41.576" S
2	29° 49' 0.182" E	26° 22' 50.964" S
3	29° 48' 22.377" E	26° 22' 0.207" S
4	29° 47' 57.776" E	26° 21' 50.152" S
5	29° 47' 53.517" E	26° 21' 31.969" S
6	29° 47' 56.427" E	26° 21' 25.384" S
7	29° 48' 2.359" E	26° 22' 28.149" S
8	29° 47' 57.631" E	26° 22' 23.809" S
9	29° 47' 46.794" E	26° 21' 31.237" S
10	29° 47' 23.419" E	26° 21' 33.837" S
11	29° 44' 51.321" E	26° 22' 16.053" S
12	29° 44' 19.842" E	26° 22' 8.044" S
13	29° 43' 5.376" E	26° 20' 52.861" S

Point	Longitude	Latitude
14	29° 43' 3.357" E	26° 20' 54.266" S
15	29° 43' 2.742" E	26° 20' 50.649" S
16	29° 42' 49.907" E	26° 20' 40.520" S
17	29° 42' 30.346" E	26° 21' 3.756" S

Table 3-3 - Co-ordinate Points of the DX1 Substation

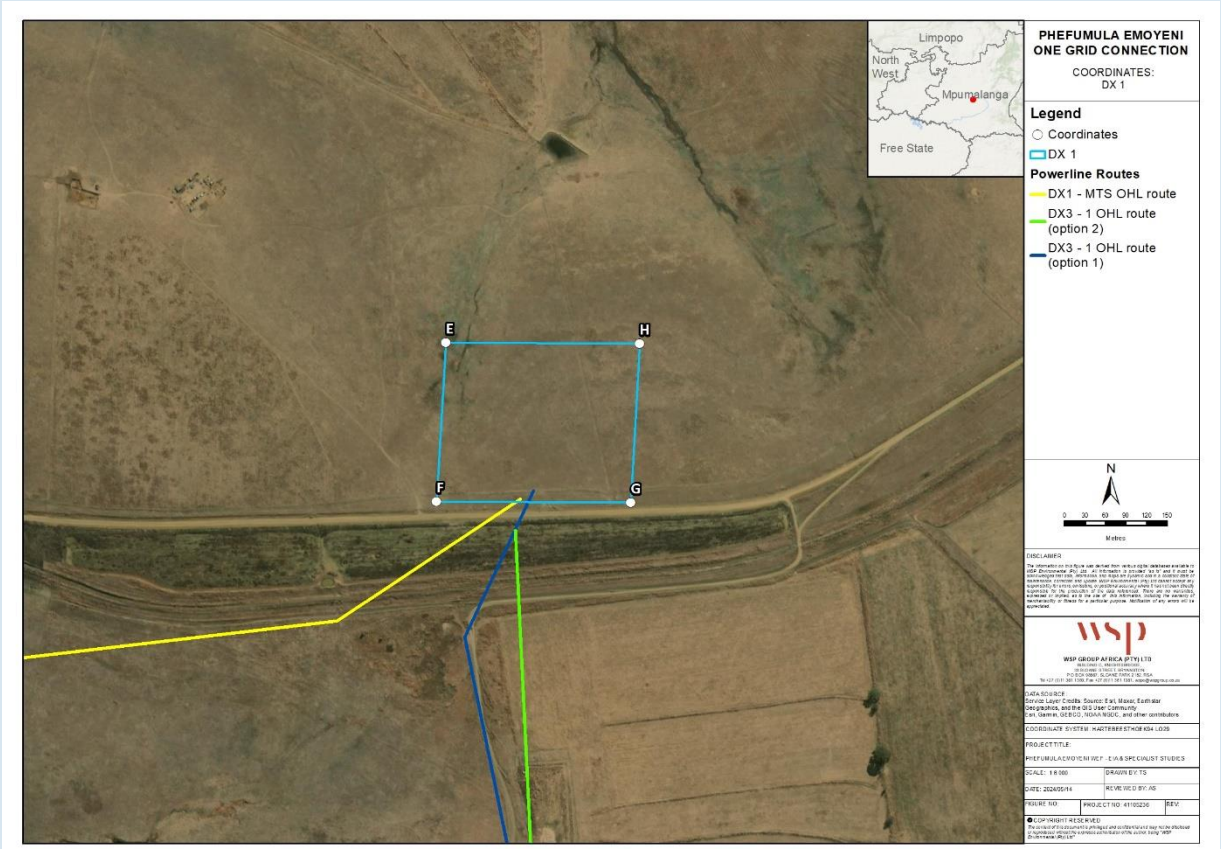
Point	Longitude	Latitude
		
E	29° 47' 52.439" E	26° 21' 17.980" S
F	29° 47' 52.011" E	26° 21' 25.545" S
G	29° 48' 2.259" E	26° 21' 25.543" S
H	29° 48' 2.671" E	26° 21' 17.985" S

Table 3-4 - Co-ordinate Points of the DX2 Substation

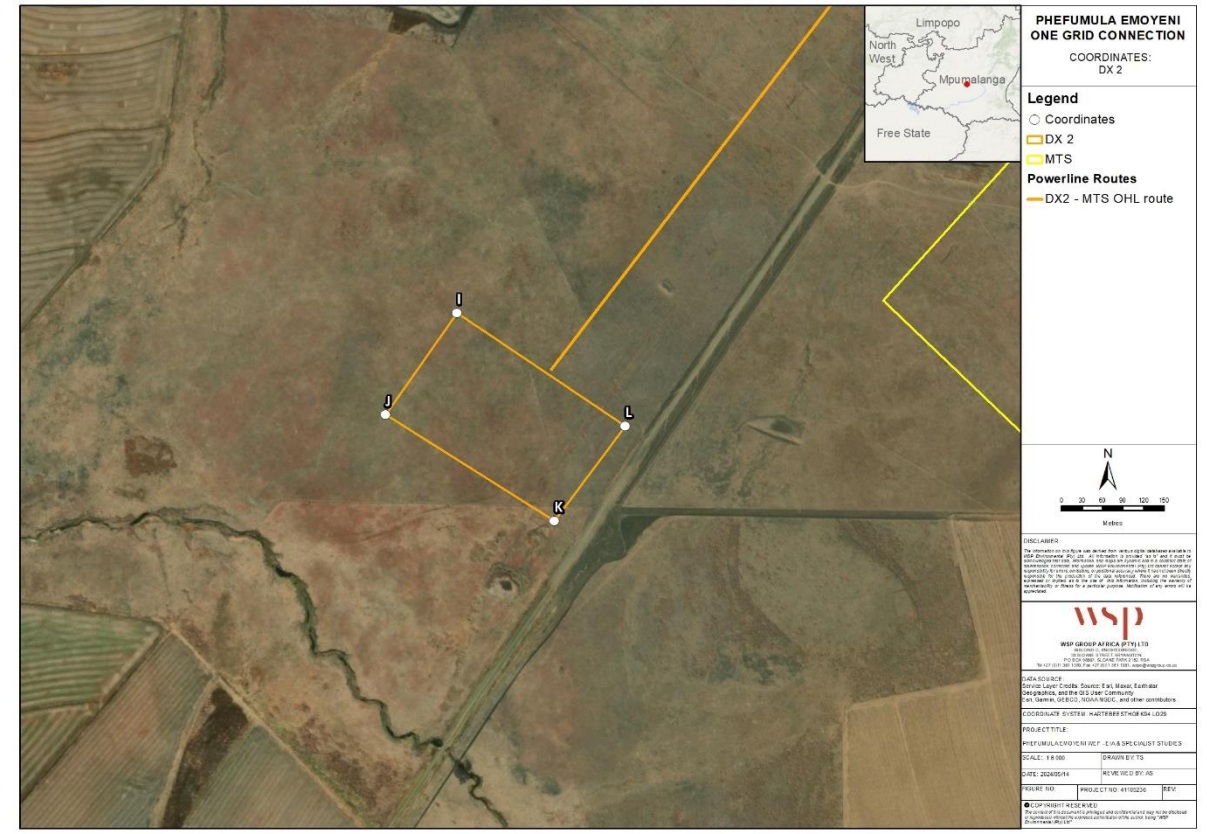
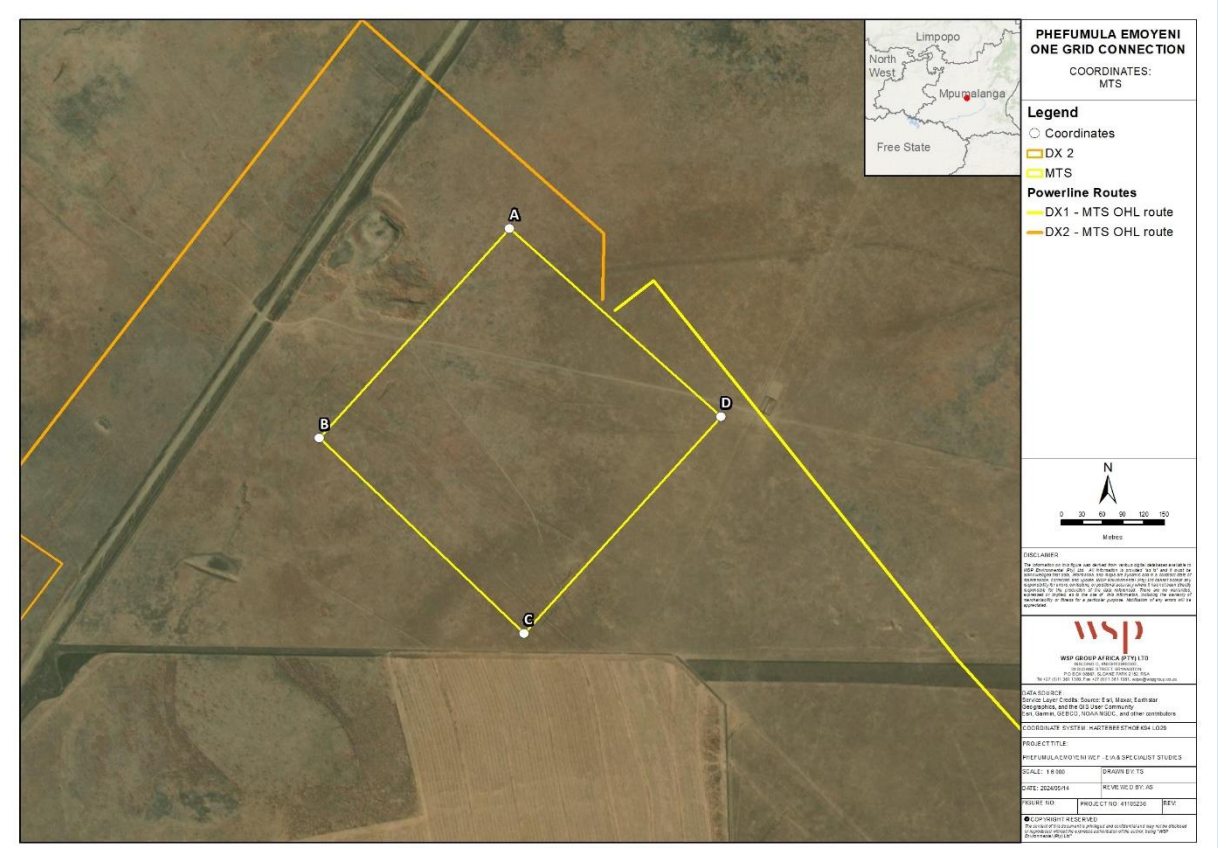
Point	Longitude	Latitude
		
I	29° 42' 25.356" E	26° 21' 1.107" S
J	29° 42' 21.627" E	26° 21' 5.972" S
K	29° 42' 30.555" E	26° 21' 10.975" S
L	29° 42' 34.276" E	26° 21' 6.448" S

Table 3-5 - Co-ordinate Points of DX3

Point	Longitude	Latitude
		
M	29° 51' 2.345" E	26° 23' 45.483" S
N	29° 51' 10.084" E	26° 23' 48.785" S
O	29° 51' 14.840" E	26° 23' 41.870" S
P	29° 51' 6.764" E	26° 23' 38.258" S

Table 3-6 - Co-ordinate Points of the MTS

Point	Longitude	Latitude
		
A	29° 42' 57.761" E	26° 20' 50.426" S
B	29° 42' 47.818" E	26° 21' 0.413" S
C	29° 42' 58.669" E	26° 21' 9.644" S
D	29° 43' 8.972" E	26° 20' 59.305" S

3.2 PROJECT INFRASTRUCTURE

The proposed Phefumula Emoyeni One electrical grid infrastructure will be developed with a transmission and distribution capacity of up to 400kV. The key components are outlined in **Table 3-7**.

Table 3-7 – Proposed project infrastructure

Technical details of the proposed Phefumula Emoyeni One electrical grid infrastructure	
Farm Portions	The 400kv grid connection, MTS and associated substations will be located over 10 farm portions.
Total Site Extent	Approximately 593.88ha
Design Specifications	
Distribution or Transmission Capacity	Up to 400kV
Up to 400kV transmission line	• Servitude width for 1 x up to 400kV transmission line is 60m for Loop-In-Loop-Out. • Height of 1 x 400kV power line structure is on average 48m, but may reach up to 50m in exceptional circumstances depending on the complexity and slope of the terrain. • Minimum conductor clearance is between 8.1m and 12.6m. • Span length between pylon structures is typically up to 100 - 250m apart, depending on complexity and slope of terrain. • For up to 400kV structures footprint sizes may vary depending on design type up to 110m^2 (10.5m by 10.5m), with concrete foundations of up to 80m^2 and depths reaching up to 3.5m typically depending on the number and design of the foundations (to be determined during the detailed design engineering phase). • The actual number of structures required will vary according to the final route alignment determined. • Pylon structures will be either monopole or lattice structures depending on what is identified as appropriate during final design. • For safety reasons, transmission lines require certain minimum clearance distances. • These are as follows: • The minimum vertical clearance distance between the ground and the transmission line is 6.7m. • The minimum vertical clearance to any fixed structure that does not form part of the transmission line is 9.4m - 11m. • The minimum distance between an up to 400kV transmission line and an existing road is 60m – 120m (depending on the type of road). • Any farming activity can be practiced under the conductors provided that safe working clearances and building restrictions are adhered to.
Up to 132kV transmission lines	• The servitude width for 1x up to 132kV transmission line is 31m. A 300m corridor must be assessed (150m on either side of the centre line) to allow for micro-siting. In the case of the Loop-In-Loop-Out alternative this servitude will apply to each of the two connecting power lines. • The maximum height for an up to 132kV powerline structure is 40m. • Pylon structures will be either monopole or lattice structures depending what is identified as appropriate during final design. • Pylon structures may require anchors with guy-wires or be anchorless.

	• For up to 132kV structures, concrete foundation sizes may vary depending on design type up to 80m² (10m by 8m), with depths reaching up to 3.5m typically in a rectangular 'pad' shape. • A working area of approximately 100m x 100m is needed for each of the proposed structures to be constructed.
Main Transmission substation (MTS) (Approx. 36Ha)	• A high voltage substation yard to allow for multiple 132kV and 400kV feeder bays and transformers, with infrastructure to allow for step-up to 400kV as required. • Standard substation electrical equipment, including but not limited to transformers, busbars, office area, operation and control room, workshop, and storage area, feeder bays, transformers, busbars, stringer strain beams, insulators, isolators, conductors, circuit breakers, lightning arrestors, relays, capacitor banks, batteries, wave trappers, switchyard, metering and indication instruments, equipment for carrier current, surge protection and outgoing feeders, as may be needed. • The control building, telecommunication infrastructure, oil dam(s) etc. • Workshop and office area within the collector substation footprint. • Fencing around the Substation. • All the access road infrastructure to and within the substation.
Three Distribution Substations	• Dx1 - approx.6.62Ha footprint • Dx2 - approx.5.23Ha footprint • Dx3 - approx.6.13Ha footprint
Temporary/ construction phase infrastructure	• Construction compound at the MTS (3ha) (site offices including conservancy tank for ablutions, stores, material laydown area, generator, fuel storage, etc.). • 3 x construction compound / laydown areas, including site office of 3ha each at each of the Dx locations (150m x 200m each) (including conservancy tank for ablutions). • Batch plant of 4-7 ha (unless a commercial source is used and concrete trucked to site, preferable to keep options open). • Portable ablution facilities will be used along the powerline routes.

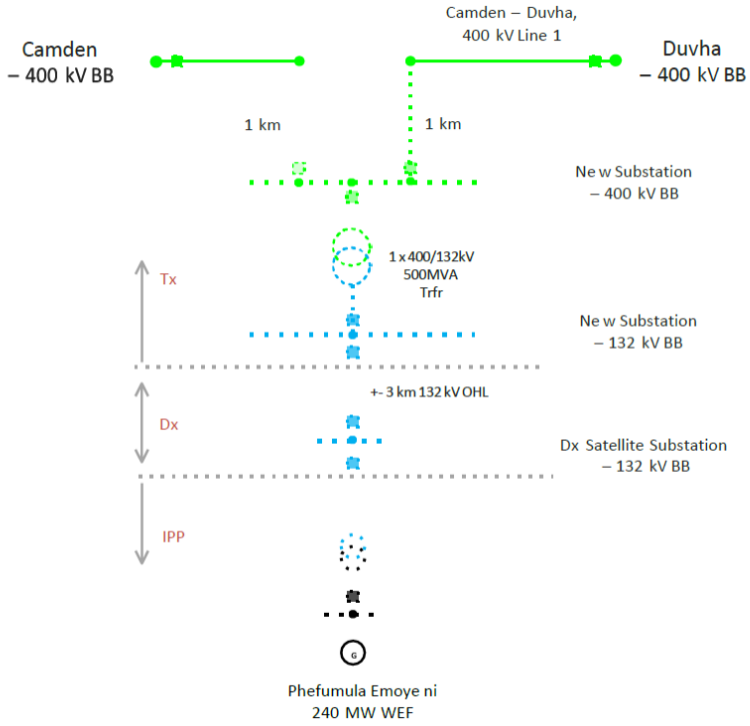


Figure 3-2 – Phefumula Emoyeni One Grid Connection

3.3 PROJECT ACTIVITIES

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 3-8.**

Table 3-8 - Construction Activities

Activity	Description
Planning phase	The actual location of the structures across which the conductors are spanned is determined by a number of factors, including negotiation with landowners, environmental features and technical requirements. As a result of these factors, it is impossible to predict the exact position of structures within the EIA process. The inherent variation that is likely in the final placement of the structures is factored into the EIA through the assessment of transmission line corridors which are 300m wide (150m either side of centre line). A final EIR is produced and provided to the DFFE with all the alternative routes assessed during the EIA process. Recommendations for the least impacting route are provided for consideration during authorisation. The DFFE will issue an environmental authorisation based on the information provided. A project specific EMPr is drafted for the project which details the specific controls that must be in place for the duration of the construction phase. The Generic DFFE EMPrs for substations and OHPLs will be included in the project specific EMPr.

Activity	Description
Survey And Line Design	Topographical surveys are conducted subsequent to identifying and securing the servitude. This is normally done by means of air-borne laser equipment to develop aerial photos, or physically walked in-field where smaller footprints are considered. The topographical profile and plans are then used by the design engineers to determine the quantity and optimal placement of the structures and conductor spans and design of the structure foundations, structures, buildings, etc. All the above information would be required by the contractor before commencing construction.
Negotiation And Registration Of A Servitude	The proposed transmission line will require the registration of a 40 - 55 m wide servitude (20 - 27.5m either side of the centreline) across all land traversed. The servitudes do not imply that the holder of the servitude (anticipated to ultimately be Eskom) is the owner of the land but merely that the holder has a right to convey electricity over that land, subject to certain provisions. The registration of a servitude can be a lengthy process, as it requires contractual negotiation with each affected landowner. Once this is complete, an application for registration of the servitude is lodged with the Registrar of Deeds to register the rights. Once the holder of the servitude exercises the option granted by the landowner, construction can commence.
Site preparation and establishment	The selected Contractor will establish a temporary site camp including, but not be limited to, temporary offices, laydown areas for equipment and materials, storage facilities, ablutions, waste storage and handling area, and parking area. The location and extent of the Contractor's camp, to be established within the Project area, will be undertaken in line with specifications detailed within the EMPr. Materials are to be collected on a daily basis from the contractor laydown area for the construction activities along the servitude. This limits areas to be impacted for storage along the servitude as well as for security purposes when activities cease at the end of each day.
Transport of components and equipment to site	Bulk materials (aggregate, steel etc.), infrastructure components, lifting and construction equipment (excavators, trucks, compaction equipment etc.) will be sourced and transported to site via suitable National and provincial routes and designated access roads. The infrastructure components may be defined as abnormal loads in terms of the Road Traffic Act (Act 29 of 1989) due to their large size and abnormal lengths and loads for transportation. A permit may be required for the transportation of these loads on public roads.
Clearance Requirements For Transmission Lines	For safety reasons, transmission lines require certain minimum clearance distances. These are as follows: • The minimum vertical clearance distance between the ground and the transmission line is 6.7m. • The minimum vertical clearance to any fixed structure that does not form part of the transmission line is 9.4m - 11m. • The minimum distance between a 400kV transmission line and an existing road is 60m – 120m (depending on the type of road).

Activity	Description
	• Any farming activity can be practiced under the conductors provided that safe working clearances and building restrictions are adhered to. • Minimum servitude to other parallel lines
Construction of OHPL, MTS and distribution substations	An MTS and three onsite distribution substations will be constructed on the site. Standard OHPL installation methods will be employed for the construction of the 132kV OHPL, which entails the excavations for foundations, planting of tower (concrete casting may be required) and stringing of the conductors. Pylon structures will be either monopole or lattice structures depending on what is identified as appropriate during final design. With a maximum height up to 50m above ground level, which are reported to have a life expectancy of more than 25 years. The actual height of the pylons will vary based on the site topography to maintain the specified clearance of the transmission lines. Once the pylons have been installed, the lines will be strung. The Contractor in collaboration with Eskom will be responsible for functional testing and commissioning of the OHPL.
Establishment of ancillary infrastructure	Ancillary infrastructure will include construction site office, temporary laydown area and workshop area for contractor's equipment.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated.

3.4 ALTERNATIVES

The EIA Regulations of 2014 (as amended) require that the S&EIA process must identify and describe alternatives to the proposed activity that were considered, or motivation for not considering alternatives. Different types or categories of alternatives could be considered including different locations, technology types, and project layouts. At the scoping level the evaluation of alternatives is provided at a high level in the absence of detailed environmental comparators for each alternative; due to the two-staged nature of the S& EIA process it is more suitable to identify and describe the potential alternatives on a high-level basis within scoping, and to perform a more detailed analysis of alternatives (with environmental comparators) in the EIA phase of the project. As such, the S&EIA will holistically assess the impacts and risks of each alternative in a comparative way, as suggested by Appendix 2 of the EIA Regulations of 2014 (as amended).

SITE ALTERNATIVES

The selection of the Phefumula Emoyeni One electrical grid infrastructure site is the outcome of a feasibility assessment by the proponent, which inter alia served to identify site options that would be optimal for energy production and grid interconnection. The Phefumula Emoyeni One electrical grid infrastructure site was selected because it is strategically located due to the following factors:

- **Proximity to the Eskom grid** – The proposed wind energy facility requires connection to the Eskom grid to transmit the generated electricity. The Project site was selected after the investigation of several power stations in Mpumalanga. The Project site was selected due to its proximity to the National Grid which will have sufficient capacity to allow the Project to

connect to it. A new Main Transmission Substation will be built and will have a loop in loop out into the existing 400kV line.

- **Land Availability and Landowner Support** – The availability of land is a key feasibility criterion in the site selection process. The project site is of a suitable land size for the proposed development. The land available for the development of the Phefumula Emoyeni One electrical grid infrastructure extends approximately 593.88ha, providing a substantial amount of land for the development of an up to 400kV grid connection, MTS and associated switching substations. The proponent has secured sufficient land for the development of the proposed grid connection with landowners within the respective cadastral portions comprising the development footprint, indicating their support and willingness for the project to proceed to development via entering into agreement with the developer. After intensive studies around the province, through analysing the aforementioned factors, it was determined that this site has the most ideal conditions for the Project.
- **Strategic Approach** – Four of Eskom's coal-fired power stations are targeted for decommissioning in the short term. These include the Komati, Camden, Grootvlei, and Hendrina power stations. These power stations range between 50 - 60 years of age. According to the 2019 IRP, over an 11-year period Eskom are expected to decommission over 11GW of its coal fired capacity. Furthermore, Mpumalanga region has sufficient grid capacity to evacuate power generated from the associated WEF.
- **Road and labour pool accessibility** – The Project site can be accessed easily via the tarred N11 national road which runs along the eastern boundary of the site. The N17 runs along the southern part of the project footprint, and the R38 to the western part.
- **Topography** - The surrounding landscape has a rolling hill topography which is suitable for the development of a grid connection and substations. The Project site itself is located on a flat high lying landscape.
- **Competition** - With regards to grid connections for renewable energy facilities, there is competition in the area within 30km, with six other approved wind energy grid connections. Should the project proceed, it will be the seventh grid connection in and around the Ermelo/Hendrina area and will act as one of the pioneering developments and open opportunities for other renewable developments. It will also serve as a large-scale case study for grid connections in the province, showing that commercially viable wind energy facilities are suitable for certain parts of Mpumalanga Province.

The site is considered suitable for the reasons provided. The investigation of an alternative site is not currently proposed within this Scoping Report.

There is no site alternative for the Phefumula Emoyeni One electrical grid infrastructure.

LAYOUT ALTERNATIVES

Due to the nature of the project area, the specialists were requested to identify the sensitive areas within the study area. These sensitive areas were utilised to identify a preliminary layout and OHL alignments that will be further assessed in the EIA Phase. The results of the sensitivity mapping and the preliminary layout are presented in Section 5.5 of this FSR.

The layout indicates up to 400kV grid connection, MTS and substations components. The layout and alignments are likely to be updated and refined as the project engineering progresses, as well

depending on sensitivities and technical inputs during the EIA phase studies. There is one alternative route layout for the Dx3 OHL option. The preliminary layout is illustrated in **Figure 2-4.**

The development of the Phefumula Emoyeni One electrical grid infrastructure layout is not yet final.

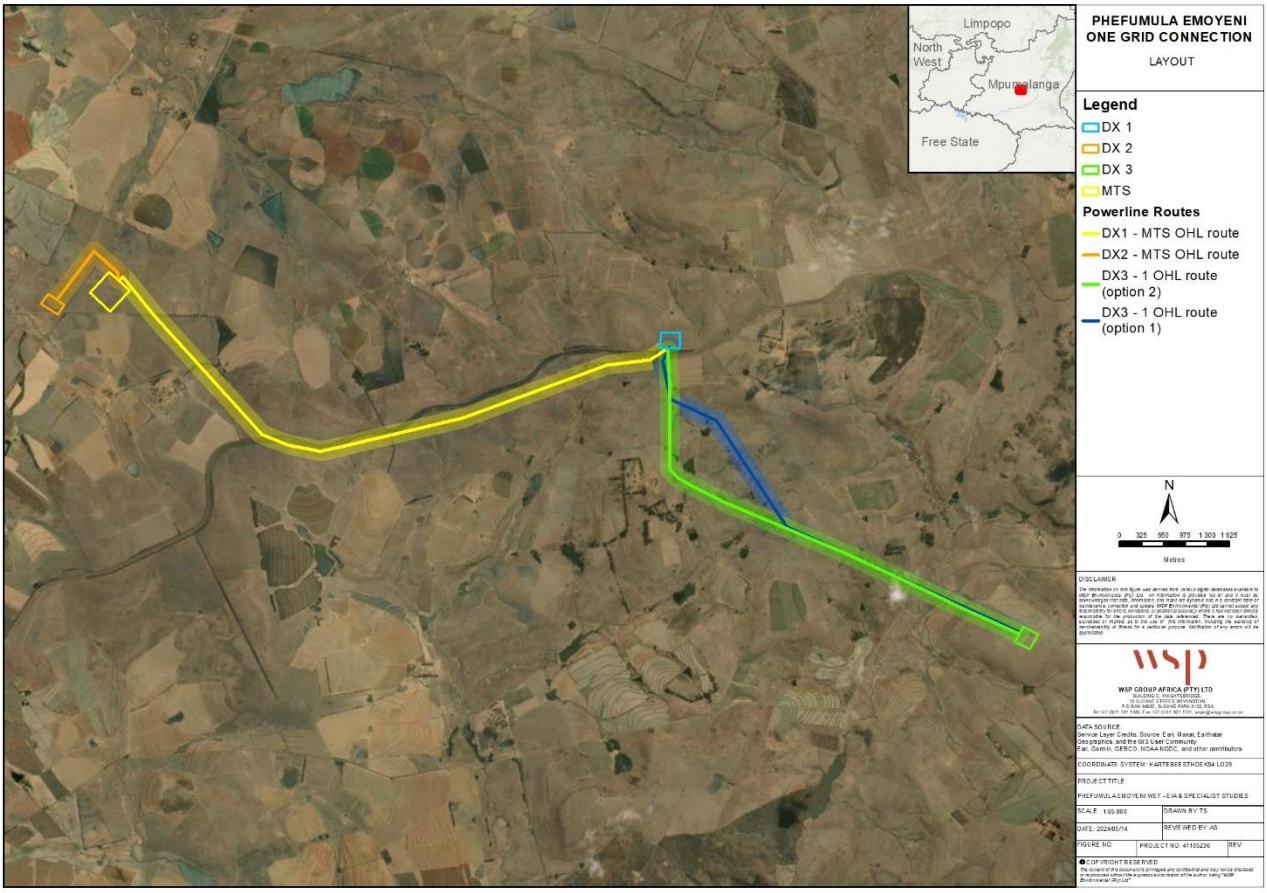


Figure 3-3 - Phefumula Emoyeni One electrical grid connection and MTS Preliminary Layout

PYLON DESIGN ALTERNATIVES

Pylon structures will be either monopole or lattice structures depending on what is identified as appropriate during final design. With a maximum height up to 50m above ground level, which are reported to have a life expectancy of more than 25 years. The actual height of the pylons will vary based on the site topography to maintain the specified clearance of the transmission lines.

Direct current (DC) power generated at the Phefumula Emoyeni One WEF will be converted into Alternating current (AC) power in inverters, and the voltage will be stepped up to a medium voltage in the inverter transformers. The medium voltage cables within the Phefumula Emoyeni One WEF will be run underground (except where a technical assessment suggest that overhead lines are applicable) to a common point before being fed to the facilities' 132kV onsite substations. The power will then be fed from the facility via three distinct 132kV OHPLs to each DX substation where the voltage will once again be stepped up to 400kV. Thereafter the up to 400kV or up to 132kV OHPL will connect the Phefumula Emoyeni One WEF to the National Grid at the proposed new MTS.

Monopole Structure Design

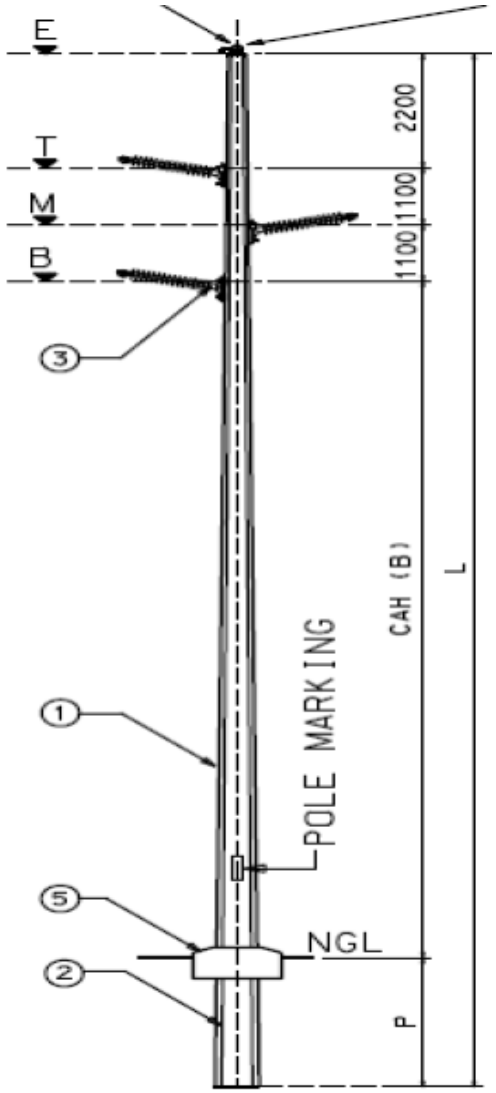


Figure 3-4 Intermediate self-supporting monopole (single circuit) (illustrative only, subject to detailed design)

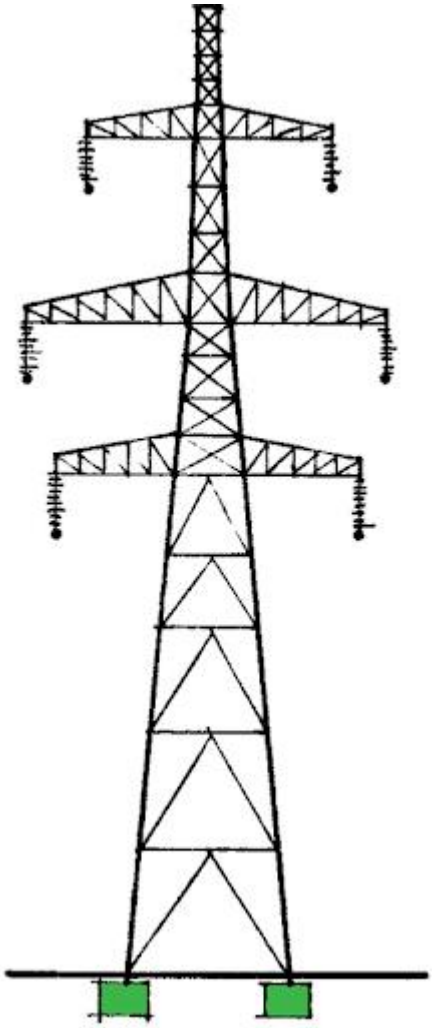


Figure 3-5 - Steel lattice structure (double circuit) (illustrative only, subject to detailed design)

NO-GO ALTERNATIVE

It is noted that the scope of this application includes the establishment of an up to 400kV transmission line, associated collector substation and proposed new MTS, for the integration of the power generated at the proposed Phefumula Emoyeni One WEF to the National Grid. The proposed transmission line is essential supporting infrastructure to the Phefumula Emoyeni One WEF, which, once developed, will generate power from renewable energy resources.

South Africa currently relies almost completely on fossil fuels as a primary energy source (approximately 90%) with coal providing 75% of the fossil fuel-based energy supply. Coal combustion in South Africa is the main contributor to carbon dioxide emissions, which is the main greenhouse gas that has been linked to climate change.

An emphasis has therefore been placed on securing South Africa's future power supply through the diversification of power generation sources. Furthermore, South Africa would have to invest in a power generation mix, and not solely rely on coal-fired power generation, to honour its commitment made under the Copenhagen Accord and to mitigate climate change challenges.

With an increasing demand in energy predicted and growing environmental concerns about fossil fuel-based energy systems, the development of large-scale renewable energy supply schemes is strategically important for increasing the diversity of domestic energy supplies and avoiding energy imports in the country.

Without the implementation of this project, the use of renewable options for power supply will be compromised in the future. This has potentially significant negative impacts on environmental and social well-being.

The no-go option is a feasible option; however, this would prevent the proponent from contributing to the significant environmental, social and economic benefits associated with the development of the renewables sector (see need and justification of the proposed project in Section 3.6). Conversely, negative environmental impacts of the project (as outlined in Section 6) associated with the development of the Phefumula Emoyeni One WEF and the up to 400kV grid connection would be avoided.

The “no project” alternative will be considered in the EIA phase as a baseline against which the impacts of the project will be assessed.

3.5 NEED AND DESIRABILITY

South Africa is faced with significant increases in electricity demand and a shortage in electricity supply. South Africa is the seventh-largest coal producer in the world, with approximately 77% of the country’s electricity generated from coal. This large dependence on coal and its use has also resulted in a variety of negative impacts on the environment, including the contribution to climate change. South Africa is also the highest emitter of greenhouse gases in Africa; attributed to the country’s energy-intensive economy that largely relies on coal-based electricity generation.

Renewable energy development is regarded as an important contribution to meeting international and national targets of reducing reliance on fossil fuels, such as coal, which contribute towards greenhouse gas emissions and resultant climate change. The need and desirability of the proposed Phefumula Emoyeni One 400kV grid connection has been considered from an international, national, and regional perspective.

3.5.1 INTERNATIONAL PERSPECTIVE

The proposed project will align with internationally recognised and adopted agreements, protocols, and conventions. This includes the Kyoto Protocol (1997) which calls for countries internationally to reduce their greenhouse gas emissions through cutting down on their reliance on fossil fuels and investing in renewable energy technologies for electricity generation. The proposed Phefumula Emoyeni One 400kV grid connection will therefore assist in adding distribution capacity to the energy sector and distribute clean electricity without greenhouse gas emissions and meet international requirements in this regard.

South Africa is also signatory to the United Nations' Development Programmes' (UNDP) Sustainable Development Goals (SDGs), particularly SGD 7 relating access to affordable, reliable and sustainable energy which is crucial to achieving many of the Sustainable Development Goals, therefore SDG 7 among the other goals specifically aligns with this project. The proposed 400kV grid connection will assist in evacuating clean energy from the Phefumula Emoyeni One WEF and contribute to affordable energy in South Africa's energy mix.

The project will also greatly contribute to the countries' efforts to reduce their carbon emissions and play their role as part of the Paris Climate Accord. The Paris Agreement is a legally binding international treaty signed by 196 countries at the COP 21 in Paris, on the 12th of December 2015 to combat climate change. The goal of the Paris Accord is to limit global warming to well below 2 degrees Celsius, compared to industrial levels to avoid catastrophic natural disasters which are driven by the global temperature increase. Therefore, to achieve this long-term temperature goal, countries aim to reach global peaking of greenhouse gas emissions as soon as possible to achieve a climate-neutral world by 2050. This project will aid in the efforts towards a just energy transition in accordance to recently signed Political Declaration between SA, USA, UK, EU, Ireland, etc.

The authorization of the Project will further align with South Africa's National Climate Response White Paper which outlines the countries efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the Greenhouse gases concentrations in the atmosphere.

3.5.2 NATIONAL PERSPECTIVE

The South African Government, through the IRP, has set a target to secure 17 800 MW of renewable energy by 2030. This is an effort to diversify the country's energy mix in response to the growing electricity demand and promote access to clean sources of energy.

The National Development Plan (NDP) is aimed at reducing and eliminating poverty in South Africa by 2030. The NDP also outlines the need to increase electricity production by 2030, with 20 000 MW of electricity capacity generated from renewable sources to move to less carbon-intensive electricity production. The Plan also envisages that South Africa will have an energy sector that provides reliable and efficient energy service at competitive rates, while supporting economic growth through job creation.

The authorisation of the Phefumula Emoyeni One 400kV grid connection to distribute the electricity will further align with South Africa's National Climate Response White Paper which outlines the country's efforts to manage the impacts of climate change and to contribute to the global efforts to stabilize the greenhouse gases concentrations in the atmosphere.

The proposed Phefumula Emoyeni One 400kV grid connection will contribute to the Just Energy Transition (JET) in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. The proposed grid connection aims towards the aforementioned national energy targets of diversification of energy supply and the promotion of clean energy. Wind and solar energy developments contribute to reduced emissions and subsequently climate change whilst promoting industrial development and job creation.

The proposed Phefumula Emoyeni One 400kV grid connection will also aid in overcoming the power shortages that are currently faced in the country. In 2023, South Africa witnessed its longest recorded hours of load shedding, with the power being off for 6 800 hours of the year. The South

African Government has taken strides to try reducing these power cuts through the implementation of bid Windows in REIPPP and lifting the independent power generation threshold to 100MW, but it is still expected that the country will undergo more load shedding. Over the years the construction of Wind facilities has become cheaper, and less time-consuming. Thus, acting as a faster and more efficient method of meeting the ever-growing demand for electricity in the country.

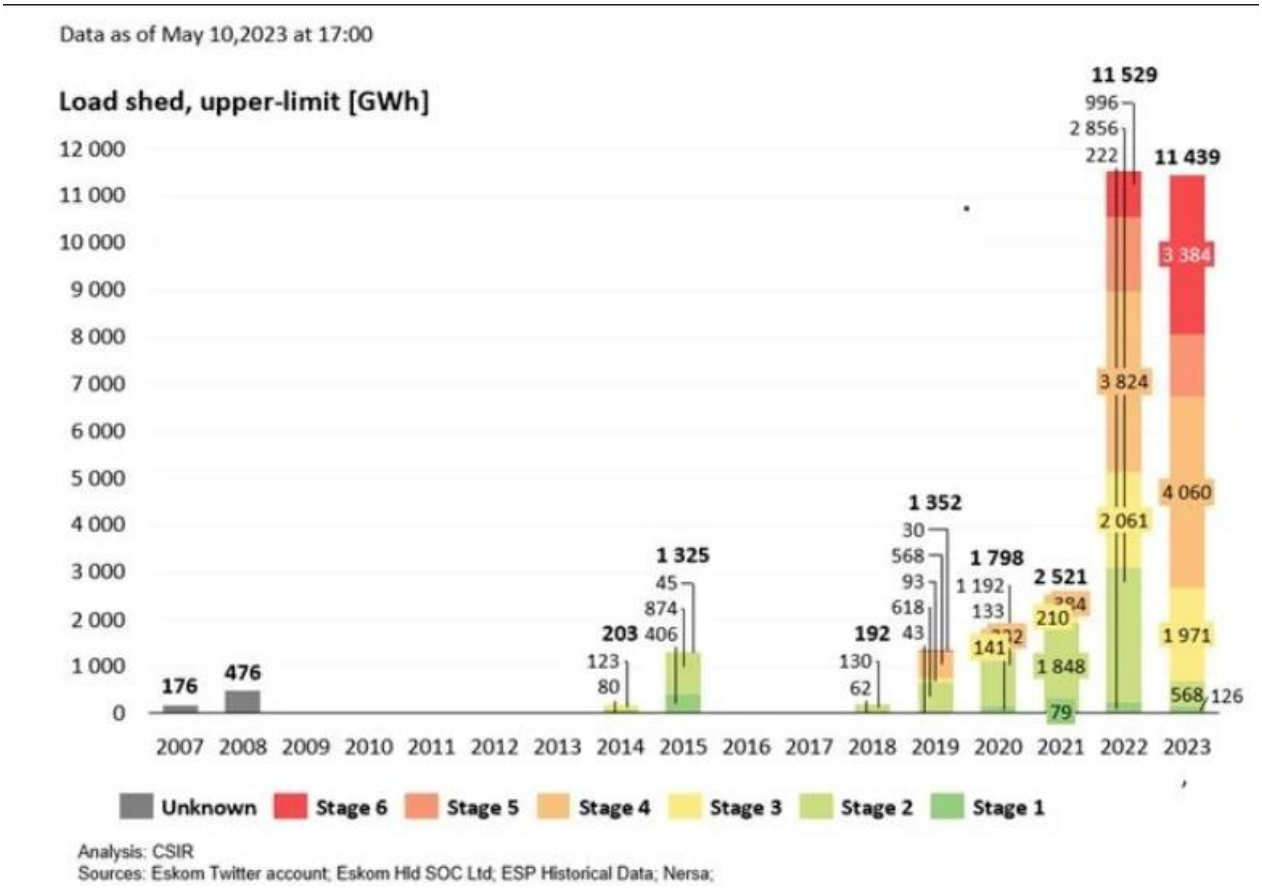


Figure 5 1: Load shedding hours over the years in South Africa

In addition, the Council for Scientific and Industrial Research (CSIR) reported that renewable energy assisted in relieving pressure on the constrained South African power system during load shedding. This indicates that renewable energy is a key factor in ensuring that the country does not face further load shedding in the future.

3.5.3 REGIONAL AND LOCAL PERSPECTIVE

Just Energy Transition

The Just Transition is described as the transition towards a low-carbon and climate-resilient economy that maximizes the benefits of climate action while simultaneously improving the welfare of the workers and their communities.

The project will pave the way for the Just Energy Transition in South Africa and promote the transition from a fossil fuel-based economy to a low carbon economy. South Africa is the seventh-largest coal consumer in the world and the leading African carbon emitter, with 435.9 million metric

tons of carbon emitted in 2022. South Africa heavily relies on coal to fire up 30 000 MW of electricity, which serves an estimated 80% of the country's energy needs.

Coal power stations and the coal mining industry play a vital component in the economic and social components of the local Mpumalanga economy. Shifting to a low carbon economy will thus need to offset or exceed the benefits being realized by fossil fuels in the province. Thus, a key factor to ensuring the success of the Just Energy Transition is not only to focus on the transition from fossil fuels to renewable energy resources but to simultaneously ensure the Just Transition of jobs and skills.

The transition towards renewable energy will improve the socio-economic conditions of the Msukaligwa Local Municipality. The Msukaligwa Local Municipality recorded an unemployment rate of 36.1% in 2021/22, with the majority of its employed in the mining and agricultural sectors. The Project will aid in solving two of the leading challenges faced by most municipalities in the country, namely the cost of electricity and lack of adequate employment opportunities. The Project will be one of the first large-scale wind energy facilities being developed in Mpumalanga. The developer foresees this project as being one of main the catalysts to realizing a true Just Energy Transition for Mpumalanga. As various career opportunities are presented by the wind industry, these are divided into four pillars that are aligned with the value chain. These four pillars are project development, component manufacturing, construction, and operation and maintenance as shown in **Figure 3-6.**

Figure 3-6 shows that the wind industry will create job opportunities throughout the supply chain. The wind industry will contribute to the Just transition in South Africa to ensure that there are no job losses but rather job transfers and skill exchange. For these opportunities to arise, renewable energy projects need to be approved in Mpumalanga to ensure that the transition from fossil fuels to renewable energy happens gradually and takes off effectively.

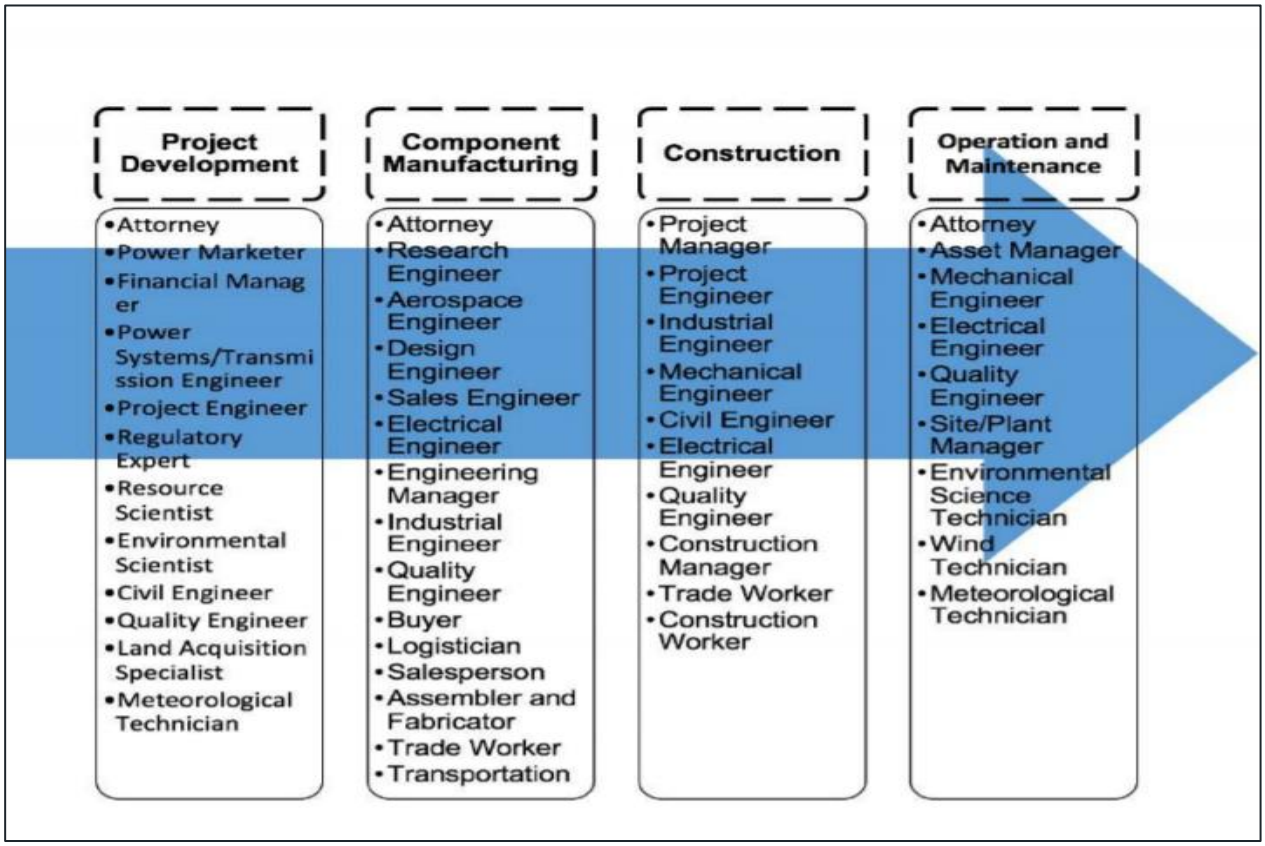


Figure 3-6: Career Opportunities presented by the Wind Industry (Source: https://www.res4africa.org/wp-content/uploads/2020/09/RES4Africa-Foundation-A-Just-Energy-Transition-in-South-Africa.pdf)

Multiple Land Use

Unlike opencast coal mining, the Project facilitates multiple land use functions within the development area. As OHPL and substations are spread out across the development area this allows multiple land use functions such as operating the wind farm in tandem with agricultural activities or even underground coal mining. This will boost the economic activities in the area which will in turn increase job opportunities in that area and help improve the local community's welfare without jeopardizing the environment. Furthermore, the multiple land use allows for the creation of multiple streams of income which assures landowners economic security.

Desirability of the Project Site

As mentioned previously, four of Eskom's coal-fired power stations have been targeted for decommissioning in the short term: Komati, Camden, Grootvlei, and Hendrina. Eskom is looking to decommission 10 500MW by 2030 and 35 000MW by 2050. Simultaneously Eskom has been looking at options for repurposing these power stations with the core aims of reusing existing power transmission infrastructure, developing new generation capacity, providing ancillary services, and mitigating socio-economic impact. The proposed Phefumula Emoyeni One 400kV grid connection, is ideally located close to the Camden Power Station to help Eskom achieve its diversification goal.

4 GOVERNANCE FRAMEWORK

4.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK

The South African regulatory framework establishes well-defined requirements and standards for environmental and social management of industrial and civil infrastructure developments. Different authorities at both national and regional levels carry out environmental protection functions. The applicable legislation and policies are shown in **Table 4-1.**

Table 4-1: Applicable National Legislation

Legislation	Description of Legislation and applicability
The Constitution of South Africa (No. 108 of 1996)	The Constitution cannot manage environmental resources as a stand-alone piece of legislation hence additional legislation has been promulgated to manage the various spheres of both the social and natural environment. Each promulgated Act and associated Regulations are designed to focus on various industries or components of the environment to ensure that the objectives of the Constitution are effectively implemented and upheld on an on-going basis throughout the country. In terms of Section 7, a positive obligation is placed on the State to give effect to the environmental rights.
National Environmental Management Act (No. 107 of 1998)	In terms of Section 24(2) of the NEMA, the Minister may identify activities, which may not commence without prior authorisation. The Minister thus published GNR 983 (as amended) (Listing Notice 1), GNR 984 (as amended) (Listing Notice 2) and GNR 985 (as amended) (Listing Notice 3) listing activities that may not commence prior to authorisation. The regulations outlining the procedures required for authorisation are published in the EIA Regulations of 2014 (GNR 982) (as amended). Listing Notice 1 identifies activities that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 2 identifies activities that require an S&EIR process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. Listing Notice 3 identifies activities within specific areas that require a BA process to be undertaken, in terms of the EIA Regulations, prior to commencement of that activity. WSP undertook a legal review of the listed activities according to the proposed project description to conclude that the activities listed in in this section are considered applicable to the development: A S&EIR process must be followed. An EA is required and will be applied for with the DFFE.
Listing Notice 1: GNR 983	**Activity 11(i)** – 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. **Description:** This activity will be triggered as the project is located outside of an urban area and includes internal grid infrastructure with a capacity of up to 132kV (x3 OHPL), three onsite IPP substations including a 33/132kV step-up transformer, and an over the fence 132kV cable to connect the onsite IPP substations to the one of three

Legislation	Description of Legislation and applicability
	distribution/ Switching Stations as part of the infrastructure (switching stations included in the grid infrastructure EIA).
Listing Notice 1: GNR 983	**Activity 12(ii)(a)(c)** The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more (a) within a watercourse (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. **Description:** The OHPLs will require the development of internal roads and/or access roads and electrical cabling (both above and underground) around the site. The physical footprint of internal access roads and electrical cabling required to connect the various components of the OHPL will either traverse the delineated watercourses on site or be located within 32m of the outer extent of the delineated watercourses on site. The values associated with the Final Layout will be confirmed during the EIA Phase.
Listing Notice 1: GNR 983	**Activity 19** The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse. **Description:** Internal access roads as well as electrical cabling required to connect the various components of the OHPL will collectively require the excavation, infilling or removal of soil exceeding 10m^3 from delineated watercourses on site. The values associated with the Final Layout will be confirmed during the EIA Phase.
Listing Notice 1: GNR 983	**Activity 24(ii)** The development of a road: (ii) A road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres **Description:** The grid connection will require the development of internal roads and/or access roads around the site. The roads will be 8-10m wide with 12m radius turning circles and gravel surfaces and 12-13m wide passing sections.
Listing Notice 1: GNR 983	**Activity 27** The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

Legislation	Description of Legislation and applicability
	Description: The OHPL is considered a linear activity and therefore this activity is not triggered by the proposed construction of the transmission lines. However, the construction of the 3 x 132 kV Eskom portion substations will require the clearance of indigenous vegetation of more than 1ha but less than 20 ha.
Listing Notice 1: GNR 983	**Activity 28(ii)** 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. **Description:** The substations are considered industrial developments and are located on several farm portions zoned for agricultural use outside an urban area, used for agricultural purposes. The total area to be developed for the Facilities (buildable area) is still to be confirmed but it will be greater than 1 hectare. Furthermore, individual components of the final layout such as the substations, O&M Buildings, Construction camps etc will individually have footprints of more than 1ha.
Listing Notice 1: GNR 983	**Activity 30** Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). **Description:** The grid connection infrastructure is located within and will require vegetation clearance or disturbance of Eastern Highveld Grassland. This ecosystem is confirmed to be listed in the National List of Ecosystems that are Threated and in Need of Protection (as indicated in GNR 1002 of 9 December 2011). Due to the fact that this ecosystem is listed as threatened, it is assumed that various threatened or protected species may be found within the development area. The restricted activity of “cutting, chopping off, uprooting, damaging or destroying, any specimen” has been identified in terms of NEM:BA and is therefore applicable to the vegetation clearance that will be required to construct the development. Considering this, Activity 30 is considered applicable.
Listing Notice 1: GNR 983	**Activity 48(i)(a)(c)** The expansion of— (i) infrastructure or structures where the physical footprint is expanded by 100 square metres or more; or where such expansion occurs— (a) within a watercourse; (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; **Description:** Transport of large infrastructure components related to the facility will require the expansion of existing access and/or internal roads, culverts or similar drainage

Legislation	Description of Legislation and applicability
	crossing infrastructure collectively exceeding 100m^2 or more beyond existing road or road reserves located within delineated watercourses on site, or within 32m of the outer extent of the delineated watercourses on site. The values associated with the Final Layout will be confirmed during the EIA Phase.
Listing Notice 1: GNR 983	**Activity 56(i)(ii)** The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; **Description:** Transport of large infrastructure components related to the facility will require the widening of existing access and/or internal roads where no reserve exists and where such road is wider than 8 metres.
Listing Notice 2: GNR 984	**Activity 9(a)(b)(c)(d)** The development of facilities or infrastructure for the transmission and distribution of electricity with a capacity of 275 kilovolts or more, outside an urban area or industrial complex excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is — (a) temporarily required to allow for maintenance of existing infrastructure; (b) 2 kilometres or shorter in length; (c) within an existing transmission line servitude; and (d) will be removed within 18 months of the commencement of development. **Description:** The proposed grid connection will include a 2km Loop in Loop out 400kV overhead powerline as well as a switching substation which will have a distribution capacity of 132kV / 400kV.
Listing Notice 3: GNR 985	***Note:*** ***The CBAs identified are as per the Mpumalanga Biodiversity Sector Plan (MBSP) formally adopted by the MEC (Member of Executive Council) for Agriculture, Rural Development, Land and Environmental Affairs in the Provincial Gazette No 2535 of 26 May 2023 (Provincial Gazette Notice 279 of 2023). Proof of the Adoption of the MBSP is included in Appendix I.***
Listing Notice 3: GNR 985	**Activity 4(f)(i)(cc)(ee)** The development of a road wider than 4 metres with a reserve less than 13,5 metres. f. Mpumalanga (i) Outside urban areas: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;

Legislation	Description of Legislation and applicability
	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; **Description:** Internal access roads required 8-10m wide roads with 12m radius turning circles, gravel surface. The exact values will be confirmed once final designs have been provided. Furthermore, roads required for the grid connection will be located within, and will require vegetation clearance or disturbance of Eastern Highveld Grassland. This ecosystem is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Similarly, the development activity contemplated will be located within the National Protected Area Expansion Strategy (NPAES) Focus Areas as well as within Critical Biodiversity Areas (CBA) as identified in the MBSP which was adopted by the MEC in May 2023.
Listing Notice 3: GNR 985	**Activity10(f)(i)(cc)(ee))(hh)** The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic metres. f. Mpumalanga i. Outside urban areas: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; (hh) Areas within a watercourse or wetland, or within 100 metres of a watercourse or wetland. **Description:** The Facility will require storage and handling of dangerous goods, including fuel, cement, and chemical storage onsite, that will be greater than 30m³ but not exceeding 80m^3 within the specified geological areas. Furthermore, storage contemplated above will be located within, and will require vegetation clearance or disturbance of Eastern Highveld Grassland, which is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Storage contemplated above will be located within, and will require vegetation clearance) as well as being located within delineated watercourses on site, or within 100m of the outer extent of the delineated watercourses on site. Similarly, the development activity contemplated will be located within the National Protected Area Expansion Strategy (NPAES) Focus Areas as well as within Critical Biodiversity Areas (CBA) as identified in the Mpumalanga Biodiversity Sector Plan (MBSP) which was adopted by the MEC in May 2023.

Legislation	Description of Legislation and applicability
Listing Notice 3: GNR 985	**Activity 12(f)(i)(ii)** The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of Indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. f.-Mpumalanga (i)Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (ii)Within critical biodiversity areas identified in bioregional plans; **Description:** The clearance of indigenous vegetation will be required for the grid connection, however, the full extent is not yet known. Such clearance will be in excess of 300m^2 and be partly located within Eastern Highveld Grassland, which is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Similarly, vegetation clearance, in excess of 300m^2, required for the grid infrastructure will be located within Critical Biodiversity Areas (CBA) and Ecological Support Areas (ESA), as identified in the Mpumalanga Biodiversity Sector Plan (MBSP) which was adopted by the MEC in May 2023. The values associated with the Final Layout will be confirmed during the EIA Phase
Listing Notice 3: GNR 985	**Activity 14(ii)(a)(c)(f)(i)(dd)(ff)** The development of— (ii) infrastructure or structures with a Physical footprint of 10 Square metres or more; where such development occurs— (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; f. Mpumalanga i. Outside urban areas: (dd) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ff) Critical biodiversity areas or ecosystem service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; **Description:** The OHPL will require the development of internal roads and/or access roads around the site. The physical footprint of internal access roads, stormwater control infrastructure and electrical cabling required to connect the various components of the grid connection will either traverse the delineated watercourses on site or be located within 32m of the outer extent of the delineated watercourses on site.

Legislation	Description of Legislation and applicability
	Furthermore, the physical footprint of internal access roads, stormwater control infrastructure and electrical cabling required to connect the various components of the grid connection will be located within Eastern Highveld Grassland, which is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).
Listing Notice 3: GNR 985	**Activity 18(f)(i)(cc)(ee)** The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre. f. Mpumalanga i. Outside urban areas: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans **Description** Transport of large infrastructure components related to the grid connection will require the widening of existing access and/or internal roads by more than 4 metres or the lengthening of existing access and/or internal roads by more than 1km within the Mpumalanga Province and outside urban areas. Furthermore, such widening will occur within Eastern Highveld Grassland, which is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Similarly, the development activity contemplated will be located within the National Protected Area Expansion Strategy (NPAES) Focus Areas as well as within Critical Biodiversity Areas (CBA) as identified in the Mpumalanga Biodiversity Sector Plan (MBSP) which was adopted by the MEC in May 2023.
Listing Notice 3: GNR 985	**Activity 23(ii)(a)(c)(f)(i)(cc)(ee)** The expansion of— (ii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more; where such expansion occurs — (a) within a watercourse; (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; f. Mpumalanga i. Outside urban areas: (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;

Legislation	Description of Legislation and applicability
	(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans; **Description:** The grid infrastructure will require the expansion of existing internal roads and/or access roads around the site. The physical footprint of the expansion activities will either traverse the delineated watercourses on site, or be located within 32m of the outer extent of the delineated watercourses on site. Furthermore, the physical footprint of the expansion activities will be located within Eastern Highveld Grassland, this ecosystem of which is listed in the National List of Ecosystems that are Threatened and in need of Protection (GNR 1002 of 9 December 2011), and subsequently listed in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Similarly, the development activity contemplated will be located within the National Protected Area Expansion Strategy (NPAES) Focus Areas as well as within Critical Biodiversity Areas (CBA) as identified in the Mpumalanga Biodiversity Sector Plan (MBSP) which was adopted by the MEC in May 2023. The values associated with the Final Layout will be confirmed during the EIA Phase.
Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GNR 320, 20 March 2020 and GNR 1150, 30 October 2020)	The protocols provide the criteria for specialist assessment and minimum report content requirements for impacts for various environmental themes for activities requiring environmental authorisation. The protocols replace the requirements of Appendix 6 of the EIA Regulations, 2014, as amended. The assessment and reporting requirements of the protocols are associated with a level of environmental sensitivity identified by the national web based environmental screening tool (screening tool). The Screening Report was generated for the project on 23/04/2024 (**Appendix D**). The following environmental themes were applicable to the Phefumula Emoyeni One electrical grid infrastructure: • Agricultural Theme • Animal Species Theme • Aquatic Biodiversity Theme • Archaeological and Cultural Heritage Theme • Civil Aviation Theme • Defence Theme • Palaeontology Theme • Plant Species Theme • Terrestrial Biodiversity Theme
National Environmental Management: Waste Act (59 of 2008) (NEM:WA)	This Act provides for regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation. The Act also provides for the licensing and control of waste management activities through GNR. 921 (2013): List of Waste Management Activities that Have, or are Likely to Have, a Detrimental Effect on the Environment. The proposed project does not constitute a Listed Activity requiring a Waste Management Licence (WML) as defined in GNR 921.

Legislation	Description of Legislation and applicability
	The Environmental Management Programme (EMPr) that will accompany the EIA Report, will include reasonable measures for the prevention of pollution and good international industry practice (GIIP).
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) was promulgated in June 2004 within the framework of NEMA to provide for the management and conservation of national biodiversity. The NEMBA's primary aims are for the protection of species and ecosystems that warrant national protection, the sustainable use of indigenous biological resources, the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources. In addition, the NEMBA provides for the establishment and functions of a South African National Biodiversity Institute (SANBI). SANBI was established by the NEMBA with the primary purpose of reporting on the status of the country's biodiversity and conservation status of all listed threatened or protected species and ecosystems. The biodiversity assessment identifies CBAs which represent biodiversity priority areas which should be maintained in a natural to near natural state. The CBA maps indicate the most efficient selection and classification of land portions requiring safeguarding in order to meet national biodiversity objectives. Based on the preliminary desktop assessment and the Scoping terrestrial biodiversity report, a significant part of the Project Area falls within CBA (Irreplaceable and Optimal). According to the description for the MBSP Terrestrial Assessment categories, CBAs are areas that are required to meet biodiversity targets (for biodiversity pattern and ecological process features). The management approach is that they should remain in a natural state. CBAs are areas of high biodiversity value which are usually at risk of being lost and usually identified as important in meeting biodiversity targets, except for Critically Endangered Ecosystems or Critical Linkages. CBAs in the Province can be divided into two sub-categories: • Irreplaceable (parts of the site are within this sub-category), and • Optimal (northern parts of the site are within this sub-category). Supplementary baseline terrestrial ecology studies will be undertaken during the EIA phase to inform the assessment of impacts and will include flora surveys of the project footprint to determine the presence of flora species of conservation concern (SCC), and bird surveys of the area to define the potential risks to bird SCC. The Conservation of Agricultural Resources Act (No. 43 of 1983) (CARA) Regulations with regards to alien and invasive species have been superseded by the National Environmental Management: Biodiversity Act, 2004 (Act no. 10 of 2004) – Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014. Specific management measures for the control of alien and invasive plants will be included in the EMPr.
National Biodiversity Offset Guideline (Issued Under Section 24j Of The National	The purpose of this guideline is to indicate when biodiversity offsets are likely to be required as mitigation by any competent authority (CA), to lay down basic principles for biodiversity offsetting and to guide offset practice in the environmental authorisation (EA) application context. This guideline is therefore applicable to applications for EA in terms of section 24 of NEMA. However, it can also be used to inform other administrative processes that

Legislation	Description of Legislation and applicability
Environmental Management Act) (First Edition (October 2021)	may involve biodiversity offsetting, including applications for EA in terms of section 24G of NEMA, emergency directives contemplated in section 30A of NEMA, applications for licences under the National Water Act, 1998, the National Forests Act, 1998 and the National Environmental Management: Waste Act, 2008, applications for development rights in terms of the Spatial Planning and Land Use Management Act, 2013 and requests for the de-proclamation, or the withdrawal of declarations, of protected areas in terms of provincial legislation or NEMPAA. Biodiversity is fundamental to the health and well-being of people, as well as economic activity and socio-economic upliftment. The National Biodiversity Assessment (2018) (NBA 2018) states that South Africa's biodiversity assets and ecological infrastructure contribute significantly towards meeting national development priorities. Biodiversity offsetting, if done correctly, can advance the environmental right in the Constitution of the Republic of South Africa, 1996 (Constitution). Section 24 of the Constitution provides that everyone has the right to, amongst other things, have the environment protected for the benefit of present and future generations through reasonable legislative and other measures that, amongst other things, promote conservation and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development. Biodiversity offsetting is one of the ways in which South Africa's protected and conservation areas can be expanded, thereby promoting conservation. It may well also help to secure ecologically sustainable development as it mitigates the adverse impact of economic and social development on biodiversity, which, in turn, underpins such development. The biodiversity offsetting process, which only applies when a biodiversity offset is required involves the following steps: • Identifying the need for a biodiversity offset. • Determining the requirements of a biodiversity offset and compilation of a Biodiversity Offset Report. • Selecting a biodiversity offset site. • Securing the biodiversity offset site. • Preparing a Biodiversity Offset Management Plan. • Preparing biodiversity offset conditions for an EA. • Concluding a Biodiversity Offset Implementation Agreement. A biodiversity offset strategy will be compiled and included in the Draft EIAr. The biodiversity offset strategy is being included as a result of the very high sensitivities confirmed in terms of avifauna, the presence of primary grasslands and PES A/B wetlands on site, the potential residual impacts as well as recommendations received from the DFFE.
National Environmental Management Protected Areas Act (No. 57 of 2003)	The purpose of the National Environmental Management Protected Areas Act (No. 57 of 2003) (NEMPAA) is to, inter alia, provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes. To this end, it provides for the declaration and management of various types of protected areas. Section 50(5) of NEMPAA states that "no development, construction or farming may be permitted in a nature reserve or world heritage site without the prior written approval of the management authority." There are no protected areas within the study area.

Legislation	Description of Legislation and applicability
	According to the National Protected Area Expansion Strategy (NPAES), there are no areas within the study area that have been identified as priority areas for inclusion in future protected areas. The study area is therefore outside the NPAES focus area.
The National Water Act (No. 36 of 1998)	The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides the framework to protect water resources against over exploitation and to ensure that there is water for social and economic development, human needs and to meet the needs of the aquatic environment. The Act defines water source to include watercourses, surface water, estuary or aquifer. A watercourse is defined in the Act as a river or spring, a natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows, and any collection of water that the Minister may declare a watercourse. Section 21 of the Act outlines a number of categories that require a water user to apply for a Water Use License (WUL) and Section 22 requires water users to apply for a General Authorisation (GA) with the Department of Water and Sanitation (DWS) if they are under certain thresholds or meet certain criteria. The list of water uses applicable to the proposed Project include: • Taking water from a water resource; • Impeding or diverting the flow of water in a watercourse; • Disposing of waste in a manner which may detrimentally impact on a water resource; • Altering the bed, banks, course or characteristics of a watercourse; The DWS will make the final decision on water uses that are applicable to the project through a pre-application meeting after which a Water Use Authorisation Application (WUA) as determined by the risk assessment will be undertaken in compliance with procedural regulations published by the DWS within General Notice 267 (GN267). These regulations specify required information per water use and the reporting structure of required supporting technical information.
The National Heritage Resources Act (No. 25 of 1999)	The National Heritage Resource Act (Act No. 25 of 1999) (NHRA) serves to protect national and provincial heritage resources across South Africa. The NHRA provides for the protection of all archaeological and palaeontological sites, the conservation and care of cemeteries and graves by the South African Heritage Resources Agency (SAHRA), and lists activities that require any person who intends to undertake to notify the responsible heritage resources agency and furnish details regarding the location, nature, and extent of the proposed development. Part 2 of the NHRA details specific activities that require a Heritage Impact Assessment (HIA) that will need to be approved by SAHRA. Parts of Section 35, 36 and 38 apply to the proposed project, principally: *Section 35 (4) - No person may, without a permit issued by the responsible heritage resources authority-* *destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or any meteorite;* *destroy, damage, excavate, remove from its original position, collect or own any archaeological or palaeontological material or object or any meteorite.* *Section 38 (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-*

Legislation	Description of Legislation and applicability
	any development or other activity which will change the character of a site— (i) exceeding 5 000 m^2 in extent, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development. In terms of Section 38(8), approval from the heritage authority is not required if an evaluation of the impact of such development on heritage resources is required in terms of any other legislation (such as NEMA), provided that the consenting authority ensures that the evaluation of impacts fulfils the requirements of the relevant heritage resources authority in terms of Section 38(3) and any comments and recommendations of the relevant resources authority with regard to such development have been taken into account prior to the granting of the consent. However, should heritage resources of significance be affected by the proposed Phefumula Emoyeni One 400kV grid connection, a permit is required to be obtained prior to disturbing or destroying such resources as per the requirements of Section 48 of the NHRA, and the SAHRA Permit Regulations (GN R668). A desktop Heritage Scoping Report (**Appendix G.8**) has been carried out by a suitably qualified specialist, revealing: • Heritage resources in the study area consist of structures and ruins older than 60 years, burial sites and Iron Age stone walled settlements; • The study area is indicated to be of high and very high palaeontological sensitivity according to SAHRIS but with the quaternary sand cover in the study area it is extremely unlikely that any fossils would be preserved; • To comply with the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) and with cognisance of known heritage resources in the area, the development footprint should be subjected to a field-based Heritage Impact Assessment (HIA) of the final impact areas. The proposed project has been loaded onto the SAHRIS portal for comment by the provincial Heritage Resource Agency.
Mineral and Petroleum Resources Development Act (No. 28 of 2002)	The aim of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources. Section 53(1) of the MPRDA provides that any person who intends to use the surface of any land in any way that may be contrary to any object of the MPRDA, or which is likely to impede any such object, must apply to the Minister of Mineral Resources (the Minister) for approval. Section 53 of the MPRDA provides a mechanism for ensuring that, inter alia, the mining of mineral resources is not detrimentally affected through the use of the surface of land and which may, for example, result in the sterilisation of a mineral resource. A Section 53 consent will be required due to the fact that the project is located on various mining right areas. The Amendment Regulations (GNR 420 of 27 March 2020) introduced a template for section 53 applications (Form Z) and the specific information that applicants will need to provide as part of a section 53 application.
Noise Control Regulations in terms of the	In South Africa, environmental noise control has been in place for three decades, beginning in the 1980s with codes of practice issued by the South African National Standards (formerly the South African Bureau of Standards, SABS) to address noise

Legislation	Description of Legislation and applicability
Environmental Conservation, 1989 (Act 73 of 1989)	pollution in various sectors of the country. Under the previous generation of environmental legislation, specifically the Environmental Conservation Act 73 of 1989 (ECA), provisions were made to control noise from a National level in the form of the Noise Control Regulations (GNR 154 of January 1992). In later years, the ECA was replaced by the National Environmental Management Act 107 of 1998 (NEMA) as amended. The National Environmental Management: Air Quality Act 39 of 2004 (NEMAQA) was published in line with NEMA and contains noise control provisions under Section 34: (1) The minister may prescribe essential national standards – (a) for the control of noise, either in general or by specific machinery or activities or in specified places or areas; or (b) for determining – (i) a definition of noise; and (ii) the maximum levels of noise. (2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards. Under NEMAQA, the Noise Control Regulations were updated and are to be applied to all provinces in South Africa. The Noise Control Regulations give all the responsibilities of enforcement to the Local Provincial Authority, where location specific by-laws can be created and applied to the locations with approval of Provincial Government. Where province-specific regulations have not been promulgated, acoustic impact assessments must follow the Noise Control Regulations. Furthermore, NEMAQA prescribes that the Minister must publish maximum allowable noise levels for different districts and national noise standards. These have not yet been accomplished and as a result all monitoring and assessments are done in accordance with the South African National Standards (SANS) 10103:2008 and 10328:2008.
Conservation of Agricultural Resources Act (No. 43 of 1983)	The Conservation of Agricultural Resources Act (Act 43 of 1983) (CARA) provides for the implementation of control measures for soil conservation works as well as alien and invasive plant species in and outside of urban areas. In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties. Various Acts administered by the DFFE and the DWS, as well as other laws (including local by-laws), spell out the fines, terms of imprisonment and other penalties for contravening the law. Although no fines have yet been placed against landowners who do not remove invasive species, the authorities may clear their land of invasive alien plants and other alien species entirely at the landowners' cost and risk. The CARA Regulations with regards to alien and invasive species have been superseded by NEMBA Alien and Invasive Species (AIS) Regulations which became law on 1 October 2014.
Civil Aviation Act (No. 13 of 2009)	Civil aviation in South Africa is governed by the Civil Aviation Act (No. 13 of 2009). This Act provides for the establishment of a stand-alone authority mandated with controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by South African Civil Aviation Authority (SACAA) as an agency of

Legislation	Description of Legislation and applicability
	the Department of Transport (DoT). SACAA achieves the objectives set out in the Act by complying with the Standards and Recommended Practices (SARPs) of the International Civil Aviation Organisation (ICAO), while considering the local context when issuing the South African Civil Aviation Regulations (SA CARs). The DFFE Screening Tool Report identified Civil Aviation as having Low-Medium- sensitivity for the proposed grid connection, as portions of the footprint being located within 8 and 15km of civil aviation aerodromes. An Application for the Approval of Obstacles will also be submitted to ATNS. SACAA will be included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought from these authorities as applicable.
Occupational Health and Safety Act (No. 85 of 1993)	The National Occupational Health and Safety Act (No. 85 of 1993) (OHSA) and the relevant regulations under the Act are applicable to the proposed project. This includes the Construction Regulations promulgated in 2014 under Section 43 of the Act. Adherence to South Africa's OHSA and its relevant Regulations is essential.
National Energy Act (No. 34 of 2008)	The National Energy Act (No. 34 of 2008) aims to ensure that diverse energy resources are available, in sustainable quantitates, and at affordable prices, to the South African economy in support of economic growth and poverty alleviation, taking into account environmental management requirements and interactions amongst economic sectors. The main objectives of the Act are to: • Ensure uninterrupted supply of energy to the Republic; • Promote diversity of supply of energy and its sources; • Facilitate effective management of energy demand and its conservation; • Promote energy research; • Promote appropriate standards and specifications for the equipment, systems and processes used for producing, supplying and consuming energy; • Ensure collection of data and information relating to energy supply, transportation and demand; • Provide for optimal supply, transformation, transportation, storage and demand of energy that are planned, organised and implemented in accordance with a balanced consideration of security of supply, economics, consumer protection and a sustainable development; • Provide for certain safety, health and environment matters that pertain to energy; • Facilitate energy access for improvement of the quality of life of the people of Republic; • Commercialise energy-related technologies; • Ensure effective planning for energy supply, transportation, and consumption; and • Contribute to sustainable development of South Africa's economy. In terms of the act, the Minister of Energy is mandated to develop and, on an annual basis, review and publish the Integrated Energy Plan (IEP) in the Government Gazette. The IEP analyses current energy consumption trends within different sectors of the economy (i.e. agriculture, commerce, industry, residential and transport) and uses this to project future energy requirements, based on different scenarios. The IEP and the Integrated Resource Plan are intended to be updated periodically to remain relevant. The framework is intended to create a balance between energy

Legislation	Description of Legislation and applicability
	demand and resource availability so as to provide low-cost electricity for social and economic development, while taking into account health, safety and environmental parameters.
Electricity Regulation Act (No. 4 of 2006)	The Electricity Regulation Act (No. 4 of 2006) (ERA) aims to: • Achieve the efficient, effective, sustainable and orderly development and operation of electricity supply infrastructure in South Africa; • Ensure that the interests and needs of present and future electricity customers and end users are safeguarded and met, having regard to the governance, efficiency. effectiveness and long-term sustainability of the electricity supply industry within the broader context of economic energy regulation in the Republic: • Facilitate investment in the electricity supply industry; • Facilitate universal access to electricity; • Promote the use of diverse energy sources and energy efficiency; • Promote competitiveness and customer and end user choice; and • Facilitate a fair balance between the interests of customers and end users, licensees, investors in the electricity supply industry and the public. The Act establishes a National Energy Regulator as the custodian and enforcer of the National Electricity Regulatory Framework. The Act also provides for licenses and registration as the manner in which generation, transmission, distribution, trading and the import and export of electricity are regulated.

4.2 POLICIES AND PLANS

Table 4-2 summarised key policies and plans as an outline of the governance framework for the project.

Table 4-2: Applicable Regional Policies and Plans

Applicable Policy	Description of Policy
National Development Plan	The National Development Plan aims to eliminate poverty and reduce inequality by 2030. The NDP identifies several enabling milestones. Of relevance to the proposed development the NDP refers to the need to produce sufficient energy to support industry at competitive prices and ensure access for poor households, while reducing carbon emissions per unit of power by about one-third. In this regard the infrastructure is not just essential for faster economic growth and higher employment. It also promotes inclusive growth, providing citizens with the means to improve their own lives and boost their incomes. Infrastructure is essential to development. Chapter 3, Economy, and Employment, identifies some of the structural challenges specific to South Africa, including an energy constraint that will act as a cap on growth and on options for industrialisation. The NDP notes that from an environmental perspective South Africa faces several related challenges. The reduction of greenhouse gas emissions and shift to a green low-carbon economy, is one of these challenges.

Applicable Policy	Description of Policy
	In terms of implementation the NDP identifies three phases. The first two are of specific relevance to the proposed project. The first phase (2012–2017) notes that ensuring the supply of energy and water is reliable and sufficient for a growing economy. The second phase (2018–2023) involves building on the first phase to lay the foundations for more intensive improvements in productivity. The provision of affordable and reliable energy is a key requirement for this to take place. Chapter 4, Economic infrastructure, notes that economic infrastructure provides the foundation for social and economic development. In this regard South Africa must invest in a strong network of economic infrastructure designed to support the country's medium- and long-term economic and social objectives. The plan envisages that, by 2030, South Africa will have an energy sector that promotes: Economic growth and development through adequate investment in energy infrastructure. The sector should provide reliable and efficient energy service at competitive rates, while supporting economic growth through job creation. Environmental sustainability through efforts to reduce pollution and mitigate the effects of climate change. More specifically, South Africa should have adequate supply security in electricity and in liquid fuels, such that economic activity, transport, and welfare are not disrupted. The plan sets out steps that aim to ensure that, in 20 years, South Africa's energy system looks very different to the current situation. In this regard coal will contribute proportionately less to primary-energy needs, while gas and renewable energy resources, will play a much larger role.
Integrated Resource Plan 2010 – 2030	The IRP is an electricity capacity plan which aims to provide an indication of the country's electricity demand, how this demand will be supplied and what it will cost. On 6 May 2011, the then Department of Energy (DoE) released the Integrated Resource Plan 2010-2030 (IRP 2010) in respect of South Africa's forecast energy demand for the 20-year period from 2010 to 2030. The promulgated IRP 2010–2030 identified the preferred generation technology required to meet expected demand growth up to 2030. It incorporated government objectives such as affordable electricity, reduced greenhouse gas (GHG) emissions, reduced water consumption, diversified electricity generation sources, localisation and regional development. The IRP recognises that Solar photovoltaic (PV), wind and concentrated solar power (CSP) with storage present an opportunity to diversify the electricity mix, to produce distributed generation and to provide off-grid electricity. Renewable technologies also present huge potential for the creation of new industries, job creation and localisation across the value chain.
New Growth Path	Government released the New Economic Growth Path Framework on 23 November 2010. The aim of the framework is to enhance growth, employment creation and equity. The policy's principal target is to create five million jobs over the next 10 years and reflects government's commitment to prioritising employment creation in all economic policies. The framework identifies strategies that will enable South Africa to grow in a more equitable and inclusive manner while attaining South Africa's developmental agenda. Central to the New Growth Path is a massive investment in infrastructure as a critical driver of jobs across the economy. In this regard the framework

Applicable Policy	Description of Policy
	identifies investments in five key areas namely: energy, transport, communication, water, and housing.
National Infrastructure Plan	The South African Government adopted a National Infrastructure Plan (NIP) in 2012. The NIP aims to transform the South African economic landscape while simultaneously creating significant numbers of new jobs and strengthening the delivery of basic services. It outlines the challenges and enablers which needs to be addressed in the building and developing of infrastructure. The Presidential Infrastructure Coordinating Commission (PICC) was established by the Cabinet to integrate and coordinate the long-term infrastructure build. The plan also supports the integration of African economies. In terms of the plan Government will invest R827 billion over the next three years to build new and upgrade existing infrastructure. The aim of the investments is to improve access by South Africans to healthcare facilities, schools, water, sanitation, housing and electrification. The plan also notes that investment in the construction of ports, roads, railway systems, electricity plants, hospitals, schools and dams will contribute to improved economic growth.
Integrated Energy Plan	The development of a National IEP was envisaged in the White Paper on the Energy Policy of the Republic of South Africa of 1998 and, in terms of the National Energy Act, 2008 (Act No. 34 of 2008), the Minister of Energy is mandated to develop and, on an annual basis, review and publish the IEP in the Government Gazette. The purpose of the IEP is to provide a roadmap of the future energy landscape for South Africa which guides future energy infrastructure investments and policy development. The IEP notes that South Africa needs to grow its energy supply to support economic expansion and in so doing, alleviate supply bottlenecks and supply-demand deficits. In addition, it is essential that all citizens are provided with clean and modern forms of energy at an affordable price. As part of the Integrated Energy Planning process, eight key objectives are identified, namely: • Objective 1: Ensure security of supply. • Objective 2: Minimise the cost of energy. • Objective 3: Promote the creation of jobs and localisation. • Objective 4: Minimise negative environmental impacts from the energy sector. • Objective 5: Promote the conservation of water. • Objective 6: Diversify supply sources and primary sources of energy. • Objective 7: Promote energy efficiency in the economy. • Objective 8: Increase access to modern energy. The IEP provides an assessment of current energy consumption trends within different sectors of the economy (i.e., agriculture, commerce, industry, residential and transport) and uses this information to identify future energy requirements, based on different scenarios. The scenarios are informed by different assumptions on economic development and the structure of the economy and consider the impact of key policies such as environmental policies, energy efficiency policies, transport policies and industrial policies, amongst others. Based on this information the IEP then determines the optimal mix of energy sources and technologies to meet those energy needs in the most cost-

Applicable Policy	Description of Policy
	effective manner for each of the scenarios. The associated environmental impacts, socio-economic benefits and macroeconomic impacts are also analysed. The IEP is therefore focused on determining the long-term energy pathway for South Africa, considering a multitude of factors which are embedded in the eight objectives. As part of the analysis four key scenarios were developed, namely the Base Case, Environmental Awareness, Resource Constrained and Green Shoots scenarios: • The Base Case Scenario assumes that existing policies are implemented and will continue to shape the energy sector landscape going forward. It assumes moderate economic growth in the medium to long term. • The Environmental Awareness Scenario is characterised by more stringent emission limits and a more environmentally aware society, where a higher cost is placed on externalities caused by the supply of energy. • The Resource Constrained Scenario in which global energy commodity prices (i.e. coal, crude oil and natural gas) are high due to limited supply. • The Green Shoots Scenario describes an economy in which the targets for high economic growth and structural changes to the economy, as set out in the National Development Plan (NDP), are met. The IEP notes that South Africa should continue to pursue a diversified energy mix which reduces reliance on a single or a few primary energy sources. In terms of existing electricity generation capacity, the IEP indicates that existing capacity starts to decline notably from 2025, with significant plant retirement occurring in 2031, 2041 and 2048. By 2050 only 20% of the current electricity generation capacity remains. As a result, large investments are required in the electricity sector in order to maintain an adequate supply in support of economic growth. By 2020, various import options have become available, and some new coal capacity is added along with new wind, solar and gas capacity. The mix of generation capacity technologies by 2050 is considerably more diverse than the current energy mix, across all scenarios. The main differentiating factors between the scenarios are the level of demand, constraints on emission limits and the carbon dioxide externality costs. In all scenarios the energy mix for electricity generation becomes more diverse over the period to 2050, with coal reducing its share from about 85% in 2015 to 15–20% in 2050 (depending on the scenario). Solar, wind, nuclear, gas and electricity imports increase their share. The Environmental Awareness and Green Shoots scenarios take on higher levels of renewable energy. An assessment of each scenario against the eight objectives with reference to renewable energy notes while all scenarios seek to ensure that costs are minimised within the constraints and parameters of each scenario, the Base Case Scenario presents the least cost followed by the Environmental Awareness, Resource Constrained and Green Shoots scenarios respectively when total energy system costs are considered. In terms of promoting job creation and localisation potential the Base Case Scenario presents the greatest job creation potential, followed by the Resource Constrained,

Applicable Policy	Description of Policy
	Environmental Awareness and Green Shoots scenarios respectively. In all scenarios, approximately 85% of total jobs are localisable. For electricity generation, most jobs result from solar technologies followed by nuclear and wind, with natural gas and coal making a smaller contribution. The Environmental Awareness Scenario, due to its stringent emission constraints, shows the lowest level of total emissions over the planning horizon. This is followed by the Green Shoots, Resource Constrained and Base Case scenarios. These trends are similar when emissions are considered cumulatively and individually by type.
National Protected Area Expansion Strategy, 2018	The National Protected Area Expansion Strategy 2018 (NPAES) areas were identified through a systematic biodiversity planning process. They present the best opportunities for meeting the ecosystem-specific protected area targets set in the NPAES and were designed with strong emphasis on climate change resilience and requirements for protecting freshwater ecosystems. These areas should not be seen as future boundaries of protected areas, as in many cases only a portion of a particular focus area would be required to meet the protected area targets set in the NPAES. They are also not a replacement for fine scale planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018). According to the DFFE screening tool, there are areas within the study area that have been identified as priority areas for inclusion in future protected areas. According to the NPAES (2018), large portions of habitat in the study area have been mapped as Priority Focus Areas for protected area expansion. Similarly, the delineations presented in the Mpumalanga Protected Area Expansion – 20 Year Plan indicate that large portions of the study area are designated as Priority 2 and Priority 3 areas for protected area expansion.

4.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK

Table 4-3 summarised key provincial and municipal plans as an outline of the governance framework for the project.

Table 4-3: Provincial and Municipal Plans

Applicable Plan	Description of Plan
Mpumalanga Biodiversity Sector Plan (MBSP)	The MBSP is such spatial tool which serves to provide such information to end-users and guide decision making to ensure that the biodiversity objectives are achieved. The MBSP is based on an objective planning approach which considers national and provincial biodiversity targets while trying to avoid conflict with competing land uses. Both terrestrial and freshwater biodiversity priority areas are identified in the MBSP, either as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs). These CBA and ESA areas must be considered and taken into account in processes that will result in a change in land use and will also form part of the

Applicable Plan	Description of Plan
	geographic areas in which certain activities will require environmental authorisation in terms of the Environmental Impact Assessment Regulations Listing Notice 3 (Government Notice R985 of 04 December 2014, as amended by Government Notice R324 of 07 April 2017), in terms of the National Environmental Management Act, 1998 (Act 107 of 1998). This MBSP Handbook presents the map products and explains how they were developed, and how and when they should be used. It describes the ecosystems and important biodiversity features of Mpumalanga and presents a set of land-use guidelines and other tools that can be used to effectively conserve Mpumalanga's biodiversity as part of living landscapes that combine multiple land-uses. The MBSP was formally adopted by the MEC (Member of Executive Council) for Agriculture, Rural Development, Land and Environmental Affairs in the Provincial Gazette No 2535 of 26 May 2023 (Provincial Gazette Notice 279 of 2023).
Gert Sibande District Municipality Integrated Development Plan (IDP) (2020/ 2021)	According to the Municipal Systems Act (Act 32 of 2000) (MSA), all municipalities have to undertake an IDP process. The IDP is a legislative requirement thus it has legal status and supersedes all other plans that guide development at local government level. The GSDM IDP Review (2019/ 2020) and Final IDP (2020/2021) has identified the following development priorities: • Municipal Transformation and Organisational Development • Basic Service Delivery and Infrastructure Development • Local Economic Development • Municipal Financial Viability and Management • Good Governance and Public Participation • Spatial Development Analysis and Rationale The main goal and strategic objective of the Basic Service Delivery and Infrastructure Development priority is a reliable and sustainable service. One of the main strategic objectives for reaching the goal is the provision of basic services such as water and electricity to an approved minimum level of standards in a sustainable manner; as per the national guidelines. **KPA 1 Municipal Transformation and Organisational Development** • To develop and retain skilled and capacitated workforce • To accelerate provision of immediate & long-term bulk Energy Water and Sanitation • Institutional Capacity Development • Motivate High Performers **KPA 2: Basic Service Delivery and Infrastructure Development infrastructure development to support effective and sustainable community services** • Roads Maintenance • To facilitate and coordinate provision of sustainable community and social services • Community Facilities Maintenance • Library Services

Applicable Plan	Description of Plan
	• To provide quality and sustainable municipal services. • Disaster Management and Fire Services • Laboratory Services • Environmental Management Services (EMS) • Municipal Health Services **KPA 3: Local Economic Development:** • To facilitate economic growth and development • Sector Development • Special Initiatives • Enterprise Development **KPA 4: Municipal Financial Viability and Management** • To ensure financial viability and provide support to local municipalities • Financial Management • Municipal Support • Budget Management and Reporting • KPA Strategic Objective Programmes • Asset Management • Supply Chain Management **KPA 5: Good Governance and Public Participation** • To ensure effective governance in the administration of the institution • Governance and Administration • Communications • Public Participation • Performance Management • Information Communication Technology (ICT) • Internal Audit Risk Management **KPA 6: Spatial Development Analysis and Rationale** • To support and coordinate spatial transformation • Strategic Planning • Development Control • Intelligence and Monitoring
Msukaligwa Local Municipality IDP (2021/ 2022)	**The following challenges or threats to the natural environment within the local municipality have been identified:** • Human population growth, transformation of land and urbanization; • Mining, especially open-cast coal mining; • Crop cultivation and afforestation. • Overgrazing; • Loss of riverine and wetland/marsh habitat through human intervention; • Air quality as the Local Municipality was amongst the five Local Municipalities that were declared as Highveld Priority Area in 2007; • Unavailability of environmental section and environmental officials to implement environmental management programmes; • Unavailability/ limited/ outdated environmental planning tools; • Unsustainable developments within the Local Municipality;

Applicable Plan	Description of Plan
	• Climate change leading to biodiversity destruction and other natural disasters; • Alien invasive plants that are replacing indigenous plants while also encroaching water bodies thereby reducing water level in them. **Efforts made to Address the Challenges** • Landfill sites are maintained on a regular basis to ensure clean environment; • Plans were put in place for conducting sewer analysis to deal with sewer spillages within the municipality; • Provisions made in the IDP for the upgrading of existing waste water treatment plants and construction of new plants; • Environmental management programmes incorporated in the IDP; • Awareness campaigns through waste management education are being conducted; • Participating in government environmental management initiatives that promote job creation and sustainable livelihoods; • Support all government initiatives to protect natural resources.

4.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS

4.4.1 IFC PERFORMANCE STANDARDS

The International Finance Corporation (IFC) is an international financial institution that offers investment, advisory, and asset management services to encourage private sector development in developing countries. The IFC is a member of the World Bank Group (WBG) and is headquartered in Washington, D.C., United States. It was established in 1956 as the private sector arm of the WBG to advance economic development by investing in strictly for-profit and commercial projects that purport to reduce poverty and promote development.

The IFC's stated aim is to create opportunities for people to escape poverty and achieve better living standards by mobilizing financial resources for private enterprise, promoting accessible and competitive markets, supporting businesses and other private sector entities, and creating jobs and delivering necessary services to those who are poverty-stricken or otherwise vulnerable. Since 2009, the IFC has focused on a set of development goals that its projects are expected to target. Its goals are to increase sustainable agriculture opportunities, improve health and education, increase access to financing for microfinance and business clients, advance infrastructure, help small businesses grow revenues, and invest in climate health.

The IFC is owned and governed by its member countries but has its own executive leadership and staff that conduct its normal business operations. It is a corporation whose shareholders are member governments that provide paid-in capital, and which have the right to vote on its matters. Originally more financially integrated with the WBG, the IFC was established separately and eventually became authorized to operate as a financially autonomous entity and make independent investment decisions. It offers an array of debt and equity financing services and helps companies face their risk exposures, while refraining from participating in a management capacity. The

corporation also offers advice to companies on making decisions, evaluating their impact on the environment and society, and being responsible. It advises governments on building infrastructure and partnerships to further support private sector development.

The IFC's Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability. The Access to Information Policy reflects IFC's commitment to transparency and good governance on its operations and outlines the Corporation's institutional disclosure obligations regarding its investment and advisory services. The Performance Standards (PSs) are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the client in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the PSs to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives. The PSs may also be applied by other financial institutions (FIs).

The Project is considered a Category B project in terms of the IFC Policy on E&S Sustainability (2012), having the potential to cause limited adverse environmental or social risks and/or impacts that are few, generally site specific, largely reversible, and readily addressed through mitigation measures.

The objectives and applicability of the eight PSs are outlined in **Table 4-4.**

Table 4-4: IFC Performance Standards Applicability to the Project

Reference	Requirements	Project Specific Applicability
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts		
Overview	Performance Standard 1 underscores the importance of managing environmental and social performance throughout the life of a project. An effective Environmental and Social Management System (ESMS) is a dynamic and continuous process initiated and supported by management, and involves engagement between the client, its workers, local communities directly affected by the project (the Affected Communities) and, where appropriate, other stakeholders.	
Objectives	• To identify and evaluate environmental and social risks and impacts of the project. • To adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimize, and, where residual impacts remain, compensate/offset for risks and impacts to workers, Affected Communities, and the environment. • To promote improved environmental and social performance of clients through the effective use of management systems. • To ensure that grievances from Affected Communities and external communications from other stakeholders are responded to and managed appropriately.	

Reference	Requirements		Project Specific Applicability
	• To promote and provide means for adequate engagement with Affected Communities throughout the project cycle on issues that could potentially affect them and to ensure that relevant environmental and social information is disclosed and disseminated.		
Aspects	1.1	Policy	The IFC Standards state under PS 1 (Guidance Note 23) that "the breadth, depth and type of analysis included in an ESIA must be proportionate to the nature and scale of the proposed project's potential impacts as identified during the course of the assessment process." This document is the first deliverable from the Scoping and EIA process undertaken for the proposed Project. The impact assessment comprehensively assesses the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr will be compiled during the EIA phase of the project.
	1.2	Identification of Risks and Impacts	
	1.3	Management Programmes	
	1.4	Organisational Capacity and Competency	
	1.5	Emergency Preparedness and Response	
	1.6	Monitoring and Review	
	1.7	Stakeholder Engagement	
	1.8	External Communication and Grievance Mechanism	
	1.9	Ongoing Reporting to Affected Communities	
Performance Standard 2: Labour and Working Conditions;			
Overview	Performance Standard 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.		
Objectives	• To promote the fair treatment, non-discrimination, and equal opportunity of workers. • To establish, maintain, and improve the worker-management relationship. • To promote compliance with national employment and labour laws. • To protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties, and workers in the client's supply chain. • To promote safe and healthy working conditions, and the health of workers. • To avoid the use of forced labour.		
Aspects	2.1	Working Conditions and Management of Worker Relationship Human Resources Policy and Management Working Conditions and terms of Engagement Workers organisation Non- Discrimination and Equal Opportunity Retrenchment Grievance Mechanism	The construction activities will require contractors for completion. A safe working environment and fair contractual agreements must be in place. The operational phase will have permanent employees for day-to-day activities as well as contractors who will all need a safe working environment and fair contractual agreements. Whilst PS2 will be applicable to the Project, it is not intended to be addressed in detail at the ESIA stage. Recommendations are provided concerning development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the developer and its partners as the Project moves towards
	2.2	Protecting the Workforce Child Labour Forced Labour	
	2.3	Occupational health and Safety	

Reference	Requirements		Project Specific Applicability
	2.4	Workers Engaged by Third Parties	implementation. In addition, measures to address the Interim Advice for IFC Clients on Supporting Workers in the Context of COVID-19 are referenced. The EMPr will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
	2.5	Supply Chain	
Performance Standard 3: Resource Efficiency and Pollution Prevention			
Overview	Performance Standard 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten people and the environment at the local, regional, and global levels. There is also a growing global consensus that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the public health and welfare of current and future generations. At the same time, more efficient and effective resource use and pollution prevention and GHG emission avoidance and mitigation technologies and practices have become more accessible and achievable in virtually all parts of the world.		
Objectives	• To avoid or minimise adverse impacts on human health and the environment by avoiding or minimising pollution from project activities. • To promote more sustainable use of resources, including energy and water. • To reduce project related GHG emissions.		
Aspects	3.1	Policy Resource Efficiency Greenhouse Gases Water Consumption	PS3-related impacts, such as the management of construction waste, hazardous substances, and stormwater are assessed in Section 7 of this report. There are no material resource efficiency issues associated with the Project. The EMPr will include general resource efficiency measures. The project is not GHG emissions intensive and a climate resilience study or a GHG emissions-related assessment is not deemed necessary for a project of this nature. However, the Phefumula Emoyeni One 400kV grid connection seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution in the construction phase will be addressed in the EMPr. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures will be included in the EMPr. Land contamination of the site from historical land use (i.e. low intensity agricultural / grazing) is not considered to be a cause for concern.
	3.2	Pollution Prevention Air Emissions Stormwater Waste Management Hazardous Materials Management Pesticide use and Management	

Reference	Requirements		Project Specific Applicability
			The waste generation profile of the project is not complex. Waste mitigation and management measures will be included in EMPr. Hazardous materials are not a key issue; small quantities of construction materials (oil, grease, diesel fuel etc.) are the only wastes expected to be associated with the project. The EMPr will take these anticipated hazardous materials into account and recommend relevant mitigation and management measures.
Performance Standard 4: Community Health, Safety, and Security			
Overview	Performance Standard 4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts.		
Objectives	• To anticipate and avoid adverse impacts on the health and safety of the Affected Community during the project life from both routine and non-routine circumstances. • To ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimizes risks to the Affected Communities.		
Aspects	4.1	Community Health and Safety Infrastructure and Equipment Design and Safety Hazardous Materials Management and Safety Ecosystem Services Community Exposure to Disease Emergency Preparedness and Response	The requirements included in PS 4 will be addressed in the S&EIA process and the development of the EMPr. During the construction phase there will be an increase in vehicular traffic along public roads, largely due to the need for importation of construction material. Pedestrian and road safety risks will be qualitatively evaluated in the S&EIA process and the clients' standard safety and security measures, as well as potential additional measures recommended by WSP, will be detailed in the EMPr.
	4.2	Security Personnel	
Performance Standard 5: Land Acquisition and Involuntary Resettlement			
Overview	Performance Standard 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons that use this land. Involuntary resettlement refers both to physical displacement (relocation or loss of shelter) and to economic displacement (loss of assets or access to assets that leads to loss of income sources or other means of livelihood) as a result of project-related land acquisition and/or restrictions on land use.		
Objectives	• To avoid, and when avoidance is not possible, minimise displacement by exploring alternative project designs. • To avoid forced eviction. • To anticipate and avoid, or where avoidance is not possible, minimise adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation, and the informed participation of those affected. • To improve, or restore, the livelihoods and standards of living of displaced persons.		

Reference	Requirements		Project Specific Applicability
	• To improve living conditions among physically displaced persons through the provision of adequate housing with security of tenure at resettlement sites.		
Aspects	5.1	Displacement Physical Displacement Economic Displacement Private Sector Responsibilities under Government Managed Resettlement	PS5 is not applicable to the proposed Phefumula Emoyeni One electrical grid infrastructure as no physical or economic displacement or livelihood restoration will be required. The proposed Phefumula Emoyeni One electrical grid infrastructure is located on privately owned land that is utilised for agriculture by the landowners. The significance of all potential agricultural impacts is kept low by the very small proportion of the land that is impacted.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources			
Overview	Performance Standard 6 recognizes that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development.		
Objectives	• To protect and conserve biodiversity. • To maintain the benefits from ecosystem services. • To promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.		
Aspects	6.1	Protection and Conservation of Biodiversity	A significant part of the Project Area falls within CBAs (Irreplaceable and Optimal). A Biodiversity Impact Assessment as well as an Avifaunal Impact Assessment and Aquatic Systems Impact Assessment have been included in the proposed scope for the EIA phase. Furthermore, a biodiversity offset plan will be part of the EIA phase. The methodologies for the specialist assessments include a combination of literature review, in-field surveys and sensitivity mapping. This substantively complies with the PS 6 general requirements for scoping and baseline assessment for determination of biodiversity and ecosystem services issues. The determination of habitat sensitivity was undertaken within the legal and best practice reference framework for South Africa. The prevalence of invasive alien species will be determined, and mitigation and management measures will be included in the EMPr.

Reference	Requirements		Project Specific Applicability
Performance Standard 7: Indigenous People			
Overview	Performance Standard 7 recognizes that Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national societies, are often among the most marginalized and vulnerable segments of the population. In many cases, their economic, social, and legal status limits their capacity to defend their rights to, and interests in, lands and natural and cultural resources, and may restrict their ability to participate in and benefit from development. Indigenous Peoples are particularly vulnerable if their lands and resources are transformed, encroached upon, or significantly degraded.		
Objectives	• To ensure that the development process fosters full respect for the human rights, dignity, aspirations, culture, and natural resource-based livelihoods of Indigenous Peoples. • To anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimize and/or compensate for such impacts. • To promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner. • To establish and maintain an ongoing relationship based on Informed Consultation and Participation (ICP) with the Indigenous Peoples affected by a project throughout the project's life-cycle. • To ensure the Free, Prior, and Informed Consent (FPIC) of the Affected Communities of Indigenous Peoples when the circumstances described in this Performance Standard are present. • To respect and preserve the culture, knowledge, and practices of Indigenous Peoples.		
Aspects	7.1	General Avoidance of Adverse Impacts Participation and Consent	As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are present within the study area. The Project does not involve displacement. PS7 will not be triggered.
	7.2	Circumstances Requiring Free, Prior, and Informed Consent Impacts on Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use Critical Cultural Heritage Relocation of Indigenous Peoples from Lands and Natural Resources Subject to Traditional Ownership or Under Customary Use	
	7.3	Mitigation and Development Benefits	
	7.4	Private Sector Responsibilities Where Government is Responsible for Managing Indigenous Peoples Issues	
Performance Standard 8: Cultural Heritage			
Overview	Performance Standard 8 recognizes the importance of cultural heritage for current and future generations.		
Objectives	• To protect cultural heritage from the adverse impacts of project activities and support its preservation. • To promote the equitable sharing of benefits from the use of cultural heritage.		

Reference	Requirements		Project Specific Applicability
Aspects	8.1	Protection of Cultural Heritage in Project Design and Execution	A desktop Heritage Scoping Report (**Appendix G.8**) has been carried out by a suitably qualified specialist, revealing that Heritage resources in the study area consist of structures and ruins older than 60 years, burial sites and Iron Age stone walled settlements. A Chance Find Procedure will be included in the EMPr during the EIA phase of the project.

4.4.2 WORLD BANK GROUP ENVIRONMENTAL HEALTH AND SAFETY GUIDELINES

In support of the Performance Standards, the World Bank Group (WBG) has published several Environmental Health and Safety (EHS) Guidelines. The EHS Guidelines are technical reference documents that address IFC's expectations regarding the industrial pollution management performance of its projects. They are designed to assist managers and decision makers with relevant industry background and technical information. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. The EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards, particularly in those aspects related to PS3: Pollution Prevention and Abatement, as well as certain aspects of occupational and community health and safety.

Where host country regulations differ from the levels and measures presented in the EHS Guidelines, projects seeking international funding may be expected to achieve whichever is more stringent. If less stringent levels or measures are appropriate in view of specific project circumstances, a full and detailed justification for any proposed alternatives is required.

The following IFC / WBG EHS Guidelines have been generally consulted during the preparation of the EIA in order to aid the identification of EHS aspects applicable to the project:

- Wind Energy (August 2015) - The EHS Guidelines for wind energy include information relevant to environmental, health, and safety aspects of onshore and offshore wind energy facilities. It should be applied to wind energy facilities from the earliest feasibility assessments, as well as the environmental impact assessment, and continue to be applied throughout the construction and operation phases.
- The guidelines list issues associated with wind energy facilities which need to be considered. These include:
  - Environmental impacts associated with the construction, operation, and decommissioning of grid connection facilities activities may include, among others, impacts on the physical environment (such as visual impact) and biodiversity (affecting bats, for instance).
  - Due to the typically remote location of wind energy grid connections, the transport of equipment and materials during construction and decommissioning may present logistical

challenges (e.g., transportation of long, rigid structures such as blades, and heavy tower sections).

- Environmental issues specific to the construction, operation, and decommissioning of grid connection projects and facilities include the following:
  - Landscape, and Visual impacts;
  - Water Quality.
- Electric Power Transmission and Distribution (2007) - information relevant to power transmission between a generation facility and a substation located within an electricity grid, in addition to power distribution from a substation to consumers located in residential, commercial, and industrial areas.
- General EHS Guidelines – this includes a section on a range of environmental, occupational health and safety, community health and safety, and construction activities that would apply to the project. The guideline also contains recommended guidelines adopted form the World Health Organisation (WHO) for ambient air and water quality, which are referred to in the relevant impact assessment sections in the ESIA report.

4.4.3 EQUATOR PRINCIPLES

The Equator Principles (EPs) is a risk management framework, adopted by financial institutions, for determining, assessing, and managing environmental and social risk in projects and is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making.

The EPs apply globally to all industry sectors and to five financial products 1) Project Finance Advisory Services, 2) Project Finance, 3) Project-Related Corporate Loans, 4) Bridge Loans and 5) Project-Related Refinance and Project-Related Acquisition Finance. The relevant thresholds and criteria for application is described in detail in the Scope section of the EP. Currently 125 Equator Principles Financial Institutions (EPFIs) in 37 countries have officially adopted the EPs, covering the majority of international project finance debt within developed and emerging markets. EPFIs commit to implementing the EPs in their internal environmental and social policies, procedures and standards for financing projects and will not provide Project Finance or Project-Related Corporate Loans to projects where the client will not, or is unable to, comply with the EPs.

While the EPs are not intended to be applied retroactively, EPFIs apply them to the expansion or upgrade of an existing project where changes in scale or scope may create significant environmental and social risks and impacts, or significantly change the nature or degree of an existing impact. The EPs have greatly increased the attention and focus on social/community standards and responsibility, including robust standards for indigenous peoples, labour standards, and consultation with locally affected communities within the Project Finance market.

The EPs have also helped spur the development of other responsible environmental and social management practices in the financial sector and banking industry and have supported member banks in developing their own Environmental and Social Risk Management Systems.

The requirements and applicability of the EPs are outlined in **Table 4-5.**

It should be noted that Principles 8 and 10 relate to a borrower's code of conduct and are therefore not considered relevant to the S&EIA process and have not been included in this discussion.

Table 4-5: Requirements and Applicability of the Equator Principles

Requirement		Project Specific Applicability
Principle 1: Review and Categorisation		
Overview	When a project is proposed for financing, the EPFI will, as part of its internal social and environmental review and due diligence, categorise such project based on the magnitude of its potential impacts and risks in accordance with the environmental and social screening criteria of the IFC. Using categorisation, the EPFI's environmental and social due diligence is commensurate with the nature, scale, and stage of the Project, and with the level of environmental and social risks and impacts. The categories are: Category A: Projects with potential significant adverse environmental and social risks and/or impacts that are diverse, irreversible or unprecedented; Category B: Projects with potential limited adverse environmental and social risks and/or impacts that are few in number, generally site-specific, largely reversible and readily addressed through mitigation measures; and Category C: Projects with minimal or no adverse environmental and social risks and/or impacts.	Based upon the significance and scale of the Project's environmental and social impacts, the proposed project is regarded as a Category B project i.e., a project with potential limited adverse environmental or social risks and/or impacts that are few in number, generally site-specific, largely reversible, and readily addressed through mitigation measures.
Principle 2: Environmental and Social Assessment		
Overview	For all Category A and Category B Projects, the EPFI will require the client to conduct an appropriate Assessment process to address, to the EPFI's satisfaction, the relevant environmental and social risks and scale of impacts of the proposed Project (which may include the illustrative list of issues found in Exhibit II). The Assessment Documentation should propose measures to minimise, mitigate, and where residual impacts remain, to compensate/ offset/ remedy for risks and impacts to Workers, Affected Communities, and the environment, in a manner relevant and appropriate to the nature and scale of the proposed Project	This document is the second deliverable (i.e., final Scoping Report) from the S&EIA process undertaken for the proposed Project. The impact assessment will be undertaken during the next phase of the S&EIA process. The assessment will comprehensively assess the key environmental and social impacts and complies with the requirements of the South African EIA Regulations. In addition, an EMPr will also be compiled.

Requirement		Project Specific Applicability
	The Assessment Documentation will be an adequate, accurate and objective evaluation and presentation of the environmental and social risks and impacts, whether prepared by the client, consultants or external experts. For Category A, and as appropriate, Category B Projects, the Assessment Documentation includes an Environmental and Social Impact Assessment (ESIA). One or more specialised studies may also need to be undertaken. For other Category B and potentially C Projects, a limited or focused environmental or social assessment may be appropriate, applying applicable risk management standards relevant to the risks or impacts identified during the categorisation process. The client is expected to include assessments of potential adverse Human Rights impacts and climate change risks as part of the ESIA or other Assessment, with these included in the Assessment Documentation.	
Principle 3: Applicable Environmental and Social Standards		
Overview	The Assessment process should, in the first instance, address compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues. The EPFI's due diligence will include, for all Category A and Category B Projects globally, review and confirmation by the EPFI of how the Project and transaction meet each of the Principles. For Projects located in Non-Designated Countries, the Assessment process evaluates compliance with the then applicable IFC PS and WBG EHS Guidelines. For Projects located in Designated Countries, compliance with relevant host country laws, regulations and permits that pertain to environmental and social issues.	As South Africa has been identified as a non-designated country, the reference framework for environmental and social assessment is based on the IFC PS. In addition, this S&EIA process has been undertaken in accordance with NEMA (the host country's relevant legislation).
Principle 4: Environmental and Social Management System and Equator Principles Action Plan		
Overview	For all Category A and Category B Projects, the EPFI will require the client to develop or maintain an Environmental and Social Management System (ESMS). Further, an Environmental and Social Management Plan (ESMP) will be prepared by	A formal project specific ESMS will be compiled in the event that the project is developed in the future. Management and monitoring plans outlined in the EMPr will serve as the basis for an ESMS for the proposed Project.

Requirement		Project Specific Applicability
	the client to address issues raised in the Assessment process and incorporate actions required to comply with the applicable standards. Where the applicable standards are not met to the EPFI's satisfaction, the client and the EPFI will agree on an Equator Principles Action Plan (EPAP). The EPAP is intended to outline gaps and commitments to meet EPFI requirements in line with the applicable standards.	
Principle 5: Stakeholder Engagement		
Overview	EPFI will require the client to demonstrate effective Stakeholder Engagement as an ongoing process in a structured and culturally appropriate manner with Affected Communities Workers and, where relevant, Other Stakeholders. For Projects with potentially significant adverse impacts on Affected Communities, the client will conduct an Informed Consultation and Participation process. To accomplish this, the appropriate assessment documentation, or non-technical summaries thereof, will be made available to the public by the borrower for a reasonable minimum period in the relevant local language and in a culturally appropriate manner. The borrower will take account of and document the process and results of the consultation, including any actions agreed resulting from the consultation. Disclosure of environmental or social risks and adverse impacts should occur early in the Assessment process, in any event before the Project construction commences, and on an ongoing basis. All Projects affecting Indigenous Peoples will be subject to a process of Informed Consultation and Participation, and will need to comply with the rights and protections for Indigenous Peoples contained in relevant national law, including those laws implementing host country obligations under international law.	The S&EIA process includes an extensive stakeholder engagement process which complies with the South African EIA Regulations. The process includes consultations with local communities, nearby businesses, and a range of government sector stakeholders (state owned enterprises, national, provincial and local departments). The stakeholder engagement process solicits interest from potentially interested parties through the placement of site notices and newspaper advertisements as well as written and telephonic communication. The stakeholder engagement process is detailed in Section 4.6. A further Stakeholder Engagement Plan will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.
Principle 6: Grievance Mechanism		
Overview	For all Category A and, as appropriate, Category B Projects, the EPFI will require the	The EMPr will include a Grievance Mechanism Process for Public Complaints

Requirement		Project Specific Applicability
	client, as part of the ESMS, to establish effective grievance mechanisms which are designed for use by Affected Communities and Workers, as appropriate, to receive and facilitate resolution of concerns and grievances about the Project's environmental and social performance. The borrower will inform the Affected Communities and Workers about the grievance mechanism in the course of the stakeholder engagement process and ensure that the mechanism addresses concerns promptly and transparently, in a culturally appropriate manner, and is readily accessible, at no cost, and without retribution to the party that originates the issue or concern.	and Issues. This procedure effectively allows for external communications with members of the public to be undertaken in a transparent and structured manner. A Grievance Mechanism will be developed and implemented as part of the ESMS (post-EIA phase) for the construction and operational phases of the project.
Principle 7: Independent Review		
Overview	For all Category A and, as appropriate, Category B Projects, an Independent Environmental and Social Consultant, not directly associated with the client, will carry out an Independent Review of the Assessment Documentation including the ESMPs, the ESMS, and the Stakeholder Engagement process documentation in order to assist the EPFI's due diligence, and assess Equator Principles compliance.	This principle will only become applicable in the event that that the project is developed in the future.
Principle 9: Independent Monitoring and Reporting		
Overview	To assess Project compliance with the Equator Principles after Financial Close and over the life of the loan, the EPFI will require independent monitoring and reporting for all Category A, and as appropriate, Category B projects. Monitoring and reporting should be provided by an Independent Environmental and Social Consultant; alternatively, the EPFI will require that the client retain qualified and experienced external experts to verify its monitoring information, which will be shared with the EPFI in accordance with the frequency required.	This principle will only become applicable in the event that the project is developed in the future.

4.5 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS

4.5.1 GENERIC EMPR RELEVANT TO AN APPLICATION FOR SUBSTATION AND OVERHEAD ELECTRICITY TRANSMISSION AND DISTRIBUTION INFRASTRUCTURE

NEMA requires that an EMPr be submitted where an EIA has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation. The content of an EMPr must either contain the information set out in Appendix 4 of the EIA Regulations, 2014, as amended, or must be a generic EMPr relevant to an application as identified and gazetted by the Minister in a government notice. Once the Minister has identified, through a government notice, that a generic EMPr is relevant to an application for EA, that generic EMPr must be applied by all parties involved in the EA process, including, but not limited to, the applicant and the CA.

GN 435 of 22 March 2019 identified a generic EMPr relevant to applications for substations and overhead electricity transmission and distribution infrastructure which require authorisation in terms of Section 42(2) of NEMA. Applications for overhead electricity transmission and distribution infrastructure that trigger Activity 11 of Listing Notice 1 or Activity 9 of Listing Notice 2 and any other listed or specified activities must use the generic EMPr.

The objective of the generic EMPr is "*to prescribe and pre-approve generally accepted impact management outcomes and impact management actions, which can commonly and repeatedly be used for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of overhead electricity transmission and distribution infrastructure. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature*."

The generic EMPrs for Substations and powerlines will be included in the Site-Specific EMPr during the EIA phase.

4.6 ADDITIONAL PERMITS AND AUTHORISATIONS

Table 4-6 outlines the additional permits and authorisations required for the proposed development, as well as the relevant Competent Authorities responsible.

Table 4-6 – Additional Permits and Authorisations required for the proposed development

Permits/Authorisation	Legislation	Relevant Authority	Status
Water Use Licence / General Authorisation	National Water Act (Act No. 36 of 1998)	Department of Water and Sanitation	Application process will run concurrently with the EIA Phase.
Notification Of Intent To Develop (NID) Section 38 (1) and Section 38 (8)	National Heritage Resource Act (Act No. 25 of 1999)	Mpumalanga Heritage Resources Authority	In Process

Permits/Authorisation	Legislation	Relevant Authority	Status
Obstacle Permit	Civil Aviation Act (Act 13 of 2009)	Air Traffic and Navigation Services / Civil Aviation Authority	In Process
Section 53 Consent	Minerals and petroleum Resources Development Act (No. 28 of 2002)	Department of Mineral Resources and Energy	Application process will run concurrently with the EIA Phase.
Permits for removal or destruction of Threatened or Protected Species (TOPs)	Mpumalanga Conservation Act (No. 10 of 1998)	MDARDLEA	Permits will be obtained prior to the commencement of construction if applicable.

5 DESCRIPTION OF BASELINE ENVIRONMENT

5.1 PHYSICAL ENVIRONMENT

The study area is in the Mpumalanga Highveld. The region has historically been dominated by farming and other agricultural uses, with vast areas under cultivation and livestock grazing. More recently, several opencast surface mining operations have been established directly east of the study area. Ermelo and the much smaller Breyten are located southeast and east of the study area respectively, while Bethal and the smaller Hendrina are located further west and north respectively. These urban centres, and especially their associated townships, are characterised by ongoing expansion.

The Local Municipality is roughly dissected by the (continental) divide between the Upper Vaal and Usuthu / Pongola Water Management Areas (WMAs). In the north of the Local Municipality, certain sub-catchments drain into the Olifants and Inkomati WMAs. The headwaters of the Vaal River are found in the western half of the Local Municipality and drain in a south-westerly direction along with the Tweefontein River.

The Usuthu River rises in the northeast of the Local Municipality. The headwaters of the Inkomati River flow northwards from the Local Municipality into the Inkomati WMA, and the headwaters of the Olifants and Klein-Olifants River drain the far north-west of the Local Municipality.

Existing vegetation in the undeveloped areas of Msukaligwa Local Municipality consists predominantly of typical highveld grasslands. Grasslands are dominated by a single layer of grasses and the amount of cover depends on rainfall and the degree of grazing. Trees are absent, except in a few localized habitats and geophytes are often abundant.

5.1.1 CLIMATE AND METEOROLOGY

Msukaligwa LM falls under the central Mpumalanga climatic zone characterized by warm, rainy summers and dry winters with sharp frosts. Rainstorms are often violent (up to 80mm per day) with severe lightning and strong winds, sometimes accompanied by hail. The winter months are droughty with the combined rainfall in June, July and August making up only 3.9% of the annual total (734mm).

The average daily maximum temperature in January (the hottest month) is 25.2°C and in July (the coldest month) is 16.7°C. Due to its position near the escarpment, the area is somewhat windier than is typical for the South - Eastern Mpumalanga Highveld, although the majority of winds are still light, and their direction is controlled by topography.

5.1.2 EXISTING NOISE CLIMATE

The existing noise climate surrounding the Phefumula Emoyeni One electrical grid infrastructure is predominantly rural with very low baseline noise levels anticipated. Noise sources include birds, insects, livestock and the activities of resident farmers. Vehicular influences may include traffic on local roads and the nearby N11 and N17 National Roads. **Figure 5-1** below shows the noise receptors in the surrounding area.

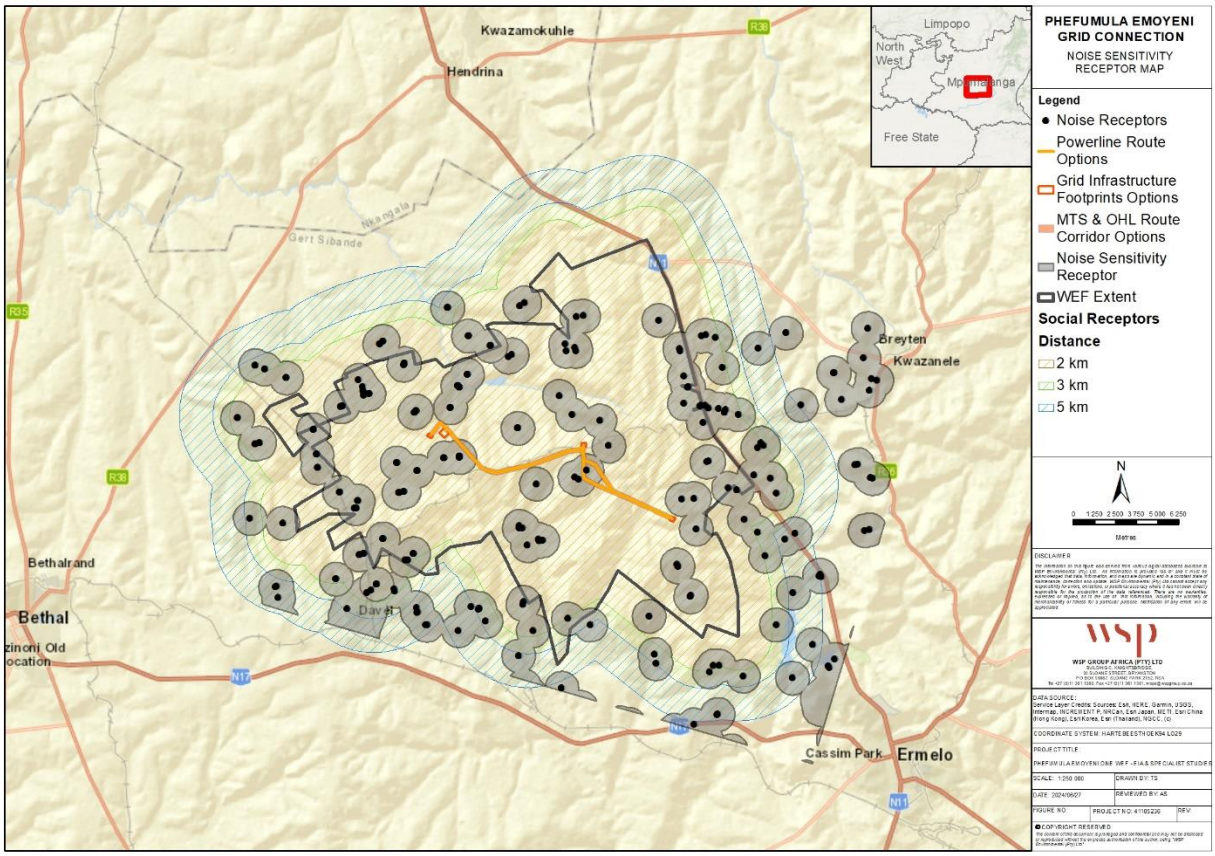


Figure 5-1 - Noise Receptors Identified

5.1.3 TOPOGRAPHY

Msukaligwa LM is characterized by the gently undulating highland topography with fairly broad to narrowly incised valleys of headwater drainages. The rural areas are also characterized by typical Highveld landscapes in the western and central parts, and more undulating terrain with dense commercial forests in the eastern parts. Interesting landscapes are found in the Chrissiesmeer pan veld area, which is more than 30 km to the east of the proposed Phefumula One electrical grid infrastructure.

There are a number of marshy areas or vleis in the upper parts of the valleys and numerous pans, which vary from insignificant vegetated depressions to large deeply etched features with bare clayey floors. An ecologically important concentration of pans and freshwater lakes is located in the Chrissiesmeer area.

The natural topography is characterised mainly by rolling plains and low hills in most areas, which is locally interspersed by small ridges and flattish plateaus (**Figure 5-2**). The study area is roughly bisected by a non-prominent east-west watershed. Lower-lying areas are associated with the numerous small drainage lines and larger streams, that drain the study area from the main central watershed to the northwest and the south respectively, which also represents the general fall in elevation.

Most of the small rises formed by these watersheds are not prominent or steep, and therefore do not form specific visual landmarks or characteristic features; however, a few of the larger landforms are landmarks in shorter-range views (**Figure 5-3**). Nevertheless, the natural topography of the site itself and much of the immediate surroundings remain largely untransformed and contribute to the rural appeal of the setting.

Figure 5-2 - Rolling plains and low hills are locally interspersed by small ridges and flattish plateaus.

Figure 5-3 - Example of a small hill forming a landmark in a short-range view

5.1.4 GEOLOGY

Msukaligwa Local Municipality is underlain predominantly by arenite and dolerite intrusions of the Karoo Supergroup. Other underlying rock types include quartz monzonite, granite and basalt. The central-western part of the study area is underlain by the Ermelo coal field, where the predominant rocks are sedimentary, i.e. sandstones, shales and siltstones of the Ecca Group that contains erinaceous strata of the coal-bearing Vryheid formation.

The nature of the terrain and soil and geological characteristics are the main drivers of freshwater occurrence and typology in the study area.

According to the published 1: 250 000 scale geological map (Sheet 2628 East Rand), the study area is underlain by rocks of the Vryheid Formation (Pv), Ecca Group of the Karoo Supergroup. The Vryheid Formation comprises sandstone, shale and coal beds. The Vryheid Formation has been extensively intruded by Jurassic age dolerite (Jd). The dolerites occur both as sills and linear dyke structures that may extend over tens of kilometres. Minor areas of recent surficial deposits, alluvium, blanket areas along Klein Olifants River and Viskuile River at the north-eastern and western portions of the site respectively.

5.1.5 SOILS AND AGRICULTURAL POTENTIAL

The site falls inside of an area that is classified as a Protected Agricultural Area (PAA). A PAA is a demarcated area in which the climate, terrain, and soil are generally conducive for agricultural production and which, historically, or in a regional context, has made important contributions to the production of the various crops that are grown across South Africa. Within PAAs, the protection of arable land, is considered a priority for the protection of food security in South Africa. However, PAAs are demarcated broadly, not at a fine scale, and there may therefore be much variation of agricultural production potential within a PAA. All land within these demarcated areas is not necessarily of sufficient agricultural potential to be suitable for crop production, due to finer scale terrain, soil, and other constraints.

Agricultural production potential, and particularly cropping potential, is one of three factors that determines the significance of an agricultural impact, together with size of footprint and duration of impact. However, in the case of a power line, one of the three factors, namely total footprint of land that will be lost to agriculture, is negligible and therefore determines the significance of the impact as negligible, regardless of what the value of the other two factors might be. The agricultural production potential of the site is therefore irrelevant, other than that cropland exists in the corridor and should be accommodated, where possible, by pylon locations.

In general, the soils across much of the site have insufficient capability for viable crop production while certain patches within it are suitable for viable cropping. Soil limitations that prevent crop production are predominantly the result of limited depth due to underlying bedrock, clay, or hardpan, or the result of poor drainage. The crop-suitable versus unsuitable soils have been identified over time through trial and error. All the deep, well-drained, suitable soils are generally cropped, and uncropped soils that are used for grazing can fairly reliably be considered to have various limitations that make them unsuitable for crop production.

In general, the site is within an area that makes a significant contribution to food production in the country. Due to the favourable climate, crop yields are high on the suitable soils with average maize yields of around 7 tons per hectare according to the farmers on site.

5.1.6 AQUATIC SYSTEMS

The study area is located within the context of the north-eastern highveld and is thus relatively high lying with altitudes ranging from around 1650m to just over 1800m above sea level. From a wider drainage and surface water occurrence perspective the study area is of significance as it is located in a wider area in which a number of large regional rivers rise. This wider area contains parts of the headwaters of the Olifants (Lepelle), Vaal, Crocodile and Phongolo Rivers. The study area straddles the catchment divide between the Olifants (drainage to the north) and Vaal Rivers (drainage to the south), and the study area thus straddles the continental divide, with drainage to the north flowing, into the Indian Ocean via the Oliphants River and Limpopo Rivers and drainage to the south flowing into the Atlantic Ocean via the Vaal and Orange Rivers. The study area accordingly falls over two quaternary catchments, with most the study area being located in the C11F catchment which comprises of parts of one of the uppermost catchments of the Vaal River and the remainder in the north-west part of the study area being located in the B11A catchment which is one of the

uppermost catchments of the Olifants River, as drained by the headwaters of the Olifants River. (**Figure 5-4**).

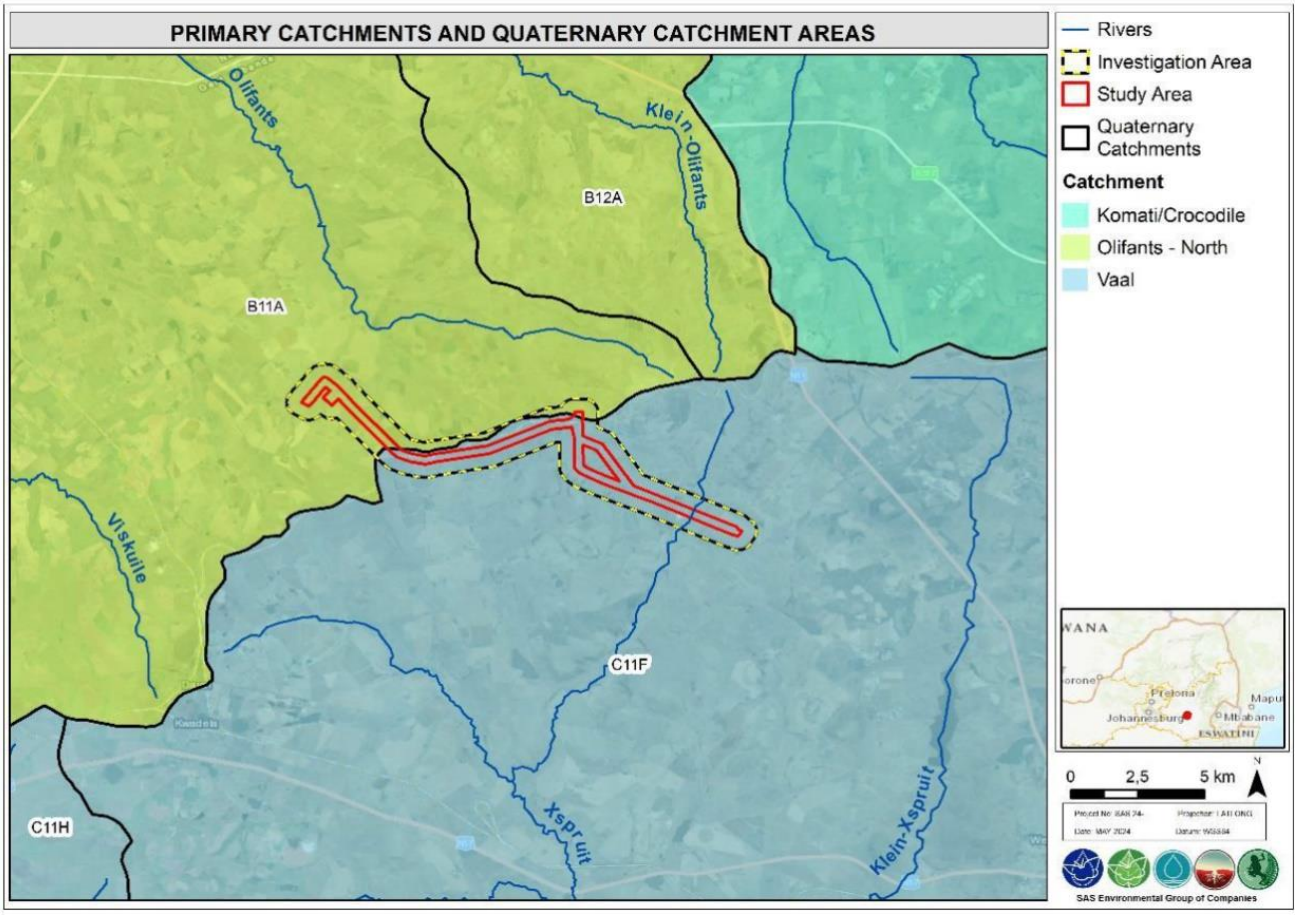


Figure 5-4 - Quaternary catchments and overall surface water drainage associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated.

From a wetland / hydromorphic soils perspective the occurrence of the Kroonstad Soil Form in approximately 20% of the hillslope terrain form is strongly indicative of the presence of wetlands as the Kroonstad soil form is a distinctive wetland soil form. Clay soils continue to dominate on the midslopes with the increasing presence of weathered or hard rock, and with an absence of soils displaying signs of wetness. Accordingly, from an analysis of the Ea23 land type, wetlands are mostly like to occur in bottomlands and to a lesser extent on foot slopes, which was borne out by observations during the site visit where the Rensburg soil form was noted to be dominant in many valley bottom wetlands.

The Ea23 land type is strongly typified by the presence of vertic clay soils, especially in lower-lying parts of the landscape. As such the vast majority of the valley bottom terrain unit within this land type consists of vertic soil forms, particularly the Rensburg Soil Form, which can be a wetland-related soil form. Vertic soils are still predominant on the hillslopes within this land type, but other poorly draining clayey soil forms (e.g. Valsrivier and Bonheim) are present.

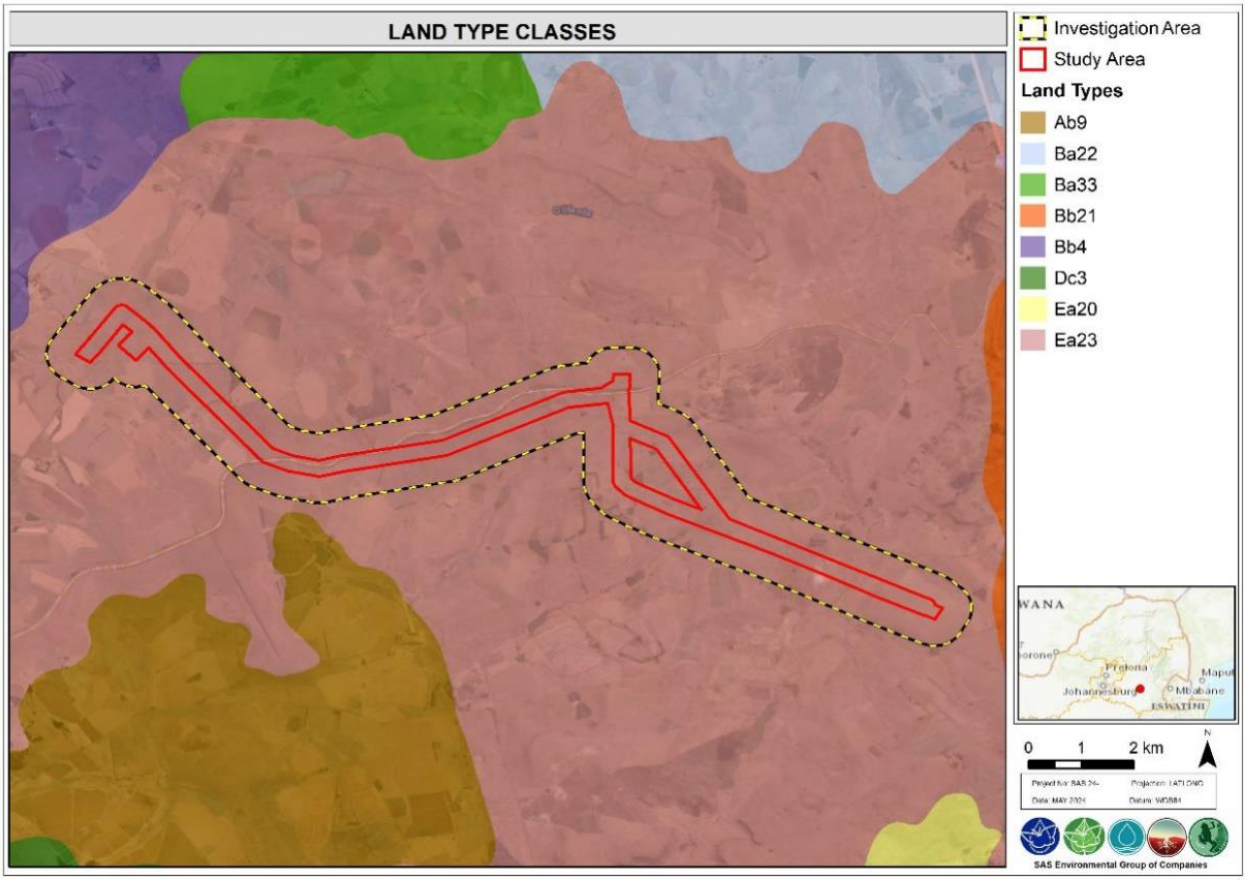


Figure 5-5 - Land types located withing the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area.

Observations from the scoping phase field assessment indicated that melanic and primarily vertic soils are dominant in the valley bottoms across most of the study area. This means that the dominant soil form in most of the valley bottom wetlands in the study area is the Rensburg Soil form, as evident in many exposed soil profiles along wetland channel banks in the study area (**Figure 5-5**). Wetlands in vertic soil settings show certain distinctive characteristics – valley bottom wetlands and seeps are predominantly channelled, with the wetland often being narrow in lateral extent and the wetland habitat within the entire latter extent of the wetland often being limited to the confines of a single thread channel. This characteristic is often exacerbated by erosion with the vertic soils being highly erosive.

Figure 5-6 - An example of an exposed Rensburg soil form profile (top left), the upper part of a seep wetland located very close to the development footprint of substation DX1 (top right); a channelled valley bottom wetland downstream of the DX3 line corridor (bottom left) and a view into the same valley bottom (looking down the DX3 corridor) (bottom right).

The moderately undulating terrain setting, with the presence of an east-west aligned high line (catchment divide) away from which surface flows drain southwards and northwards within shallow valley heads has resulted in a relatively high drainage density in the study area (refer to **Figure 5-4**). Accordingly, seeps are very common on the sloping ground in the upper slopes and valley heads within the higher lying, sloping ground that is located on either side of the Olifants-Vaal catchment divide in the study area.

Such seeps are typically relatively narrow, often channelled features (as described above), with most seeps having experienced a degree of erosion.

5.1.6.1 Valley Bottom Wetlands

Valley bottom wetlands in the wider area are generally narrow features with the absence of extensive lateral wetland habitat beyond the relatively incised wetland channel. However wider areas of lateral wetland habitat do exist in some reaches, with these being located in wide, gently sloping valleys with the wetland being characterised by a meandering shallow channel which will regularly overtop its banks, thereby inundating the lateral wetland habitat. The valley bottom wetland crossed by the DX3 corridor is characterised by a relatively incised natural channel with the channel having eroded down to the sandstone bedrock in places, forming areas of sandstone sheet rock within the wetland (**Figure 5-5)**.

Vegetatively, the study area is located within the grassland biome and accordingly wetlands are largely graminoid-dominated, with the occurrence of forbs and herbs, many of which are annual in nature. Phragmites australis reedbeds and Typha capensis dominate the channels of the valley bottom wetlands. Wetland vegetation was noted to be moribund in many valley bottom wetland settings, with sedge species *Eleocharis dregeana* forming extensive stands. Many seeps were noted to be dominated by stands of *Imperata cylindrica.*

The moderately undulating terrain setting, with the presence of an east-west aligned high line (catchment divide) away from which surface flows drain southwards and northwards within shallow valley heads has resulted in a relatively high drainage density in the study area. Accordingly, seeps are very common on the sloping ground in the upper slopes and valley heads within the higher lying, sloping ground that is located on either side of the Olifants-Vaal catchment divide in the study area. Such seeps are typically relatively narrow, often channelled features (as described above), with most seeps having experienced a degree of erosion.

Freshwater ecosystems in the wider area are subject to a number of impacts, the most prominent of which is the transformation of wetland habitat and the hydrological and geomorphological alteration caused by the impounding (damming) of seeps and valley bottoms. Most of the larger valley bottoms in the wider area have been dammed, with large area of wetland habitat having been cumulatively transformed to open water habitats.

In the context of the grid connection study area, many of the seeps draining the southern side of the Olifants-Vaal catchment divide in the uppermost parts of the C11F quaternary catchment have been dammed. The effects of such impounding features are pronounced in many wetlands where there is a clear vegetative response to increased wetness upstream of the impounding structure and much drier conditions downstream of it as insufficient water is allowed to bypass under the impounding structure.

The catchments of certain wetlands in the study area are cultivated for crops and accordingly the timing and patterns of inflows from the catchments to the wetlands have been altered.

Geomorphological balances have also been affected due to increased availability of sediments as a result of tillage. Ecological processes have accordingly also been disrupted with wetlands in such land use settings being increasingly fragmented. Certain seep wetlands have been vegetatively transformed by cultivation, with the resultant loss of wetland habitat in such wetland units. In certain

wetlands gulley erosion is prominent, with the water table having been lowered and loss of wetland habitat having resulted. Although not widespread, reaches of certain wetlands have been infested with alien invasive vegetation such as poplars (*Populus sp*.).

Despite these varying impacting factors, wetlands in the study area perform several critically important ecosystem services, most notably of which is streamflow regulation, flood control, biodiversity maintenance and provision of critical resources to sustain parts of the rural economy in terms of livestock grazing and provision of water for irrigation. In a fragmented context of land use related natural habitat transformation, wetlands provide highly important ecological corridors and linkages between residual areas of natural habitat.

5.1.6.2 Fresh water Ecosystems

The desk-based delineation and ground truthing confirmed the presence of numerous freshwater ecosystems that are distributed in most parts of the study area and within the associated investigation area. These freshwater ecosystems were confirmed to largely be wetlands. The two most commonly occurring wetland hydrogeomorphic (HGM) forms are:

- Seep wetlands.
- Channelled Valley Bottom wetlands.
- The following wetland HGM forms are also found in the study area:
- Unchannelled Valley Bottom wetlands.
- Depression wetlands.

The freshwater ecosystems identified were classified according to the Classification System (Ollis et al., 2013) as Inland Systems. The freshwater ecosystems fall within the Highveld Aquatic Ecoregion and the Mesic Highveld Grassland Groups 3 and 4 WetVeg (wetland vegetation) groups, classified by Mbona *et al.* (2015) as “Least Concern”. At Levels 3 (Landscape Unit) and 4 (HGM Type) of the Classification System, the systems were classified as per the summary in **Table 5-1**, below.

The freshwater ecosystems are depicted in the maps in **Figure 5-7 to Figure 5-9** below.

Table 5-1 - Characterisation at Levels 3 and 4 of the Classification System (Ollis et al., 2013) of the freshwater ecosystems associated with the Phefumula Emoyeni One 400kV grid connection study and investigation areas.

Freshwater Ecosystem HGM Type	Level 3: Landscape unit	Level 4: Hydrogeomorphic (HGM) Type
Channelled Valley Bottom Wetland	Valley floor—the base of a valley, situated between two distinct valley side-slopes, where alluvial or fluvial processes typically dominate.	A mostly flat wetland area located along a valley floor, characterised by the presence of an active channel running through it.
Seep Wetland	Slope-an inclined stretch of ground typically located on the side of a mountain, hill or valley, not forming part	A wetland area located on gently to steeply sloping land and dominated by colluvial (i.e.

Freshwater Ecosystem HGM Type	Level 3: Landscape unit	Level 4: Hydrogeomorphic (HGM) Type
	of a valley floor. Includes scarp slopes, mid-slopes and foot-slopes.	gravity-driven), unidirectional movement of water and material down-slope.

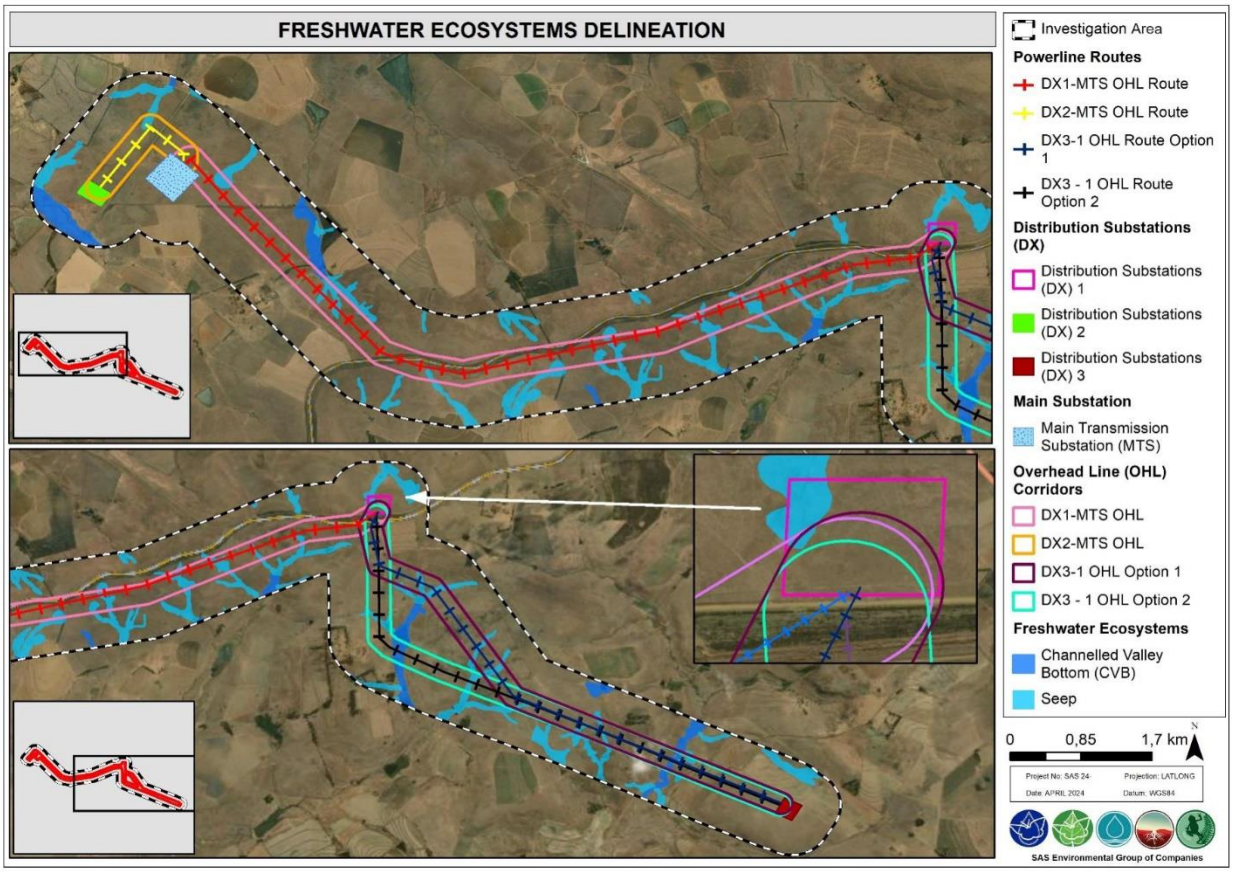


Figure 5-7 - Delineated freshwater ecosystems associated with proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area.

The study area and investigation area in the south and east fall within CODE 1 FEPA catchment, while the remainder is not indicated to be within a FEPA catchment. Code1 (FEPAs) achieve biodiversity targets for river ecosystems and threatened fish species and were identified in rivers that are currently in a good condition. Although the FEPA status applies to the actual river reach within the sub-quaternary catchment the surrounding land and smaller stream network needs to be managed in a way that maintain the good condition of the river reach

The study area and investigation areas fall within the Mesic Highveld Grassland Group 3 and Group 4. These vegetation groups are considered to be Least Threatened (LT) according to Mbona *et al.* (2015).

The NFEPA database indicates numerous wetlands within the study area and the associated investigation area, the majority of which are seeps and flat wetlands. The large seep and flat wetlands in the western section are indicated by the database to be in a largely Natural/Near-Natural (Class AB) and Moderately Modified (Class C) ecological condition. The majority of the smaller seep wetlands are indicated by the database to be in a Heavily to Critically Modified (Class Z) ecological condition. No other HGM except the flat and seep wetlands are indicated by the database.

According to the NFEPA (2011) database, the unnamed tributary of the Xspruit River is indicated by the database to traverse the study area and its associated investigation area in the west. The Unnamed tributary of Xspruit River is indicated to be in a Natural to Near-Natural (RIVERCON A/B) ecological condition by the NFEPA Rivers Database.

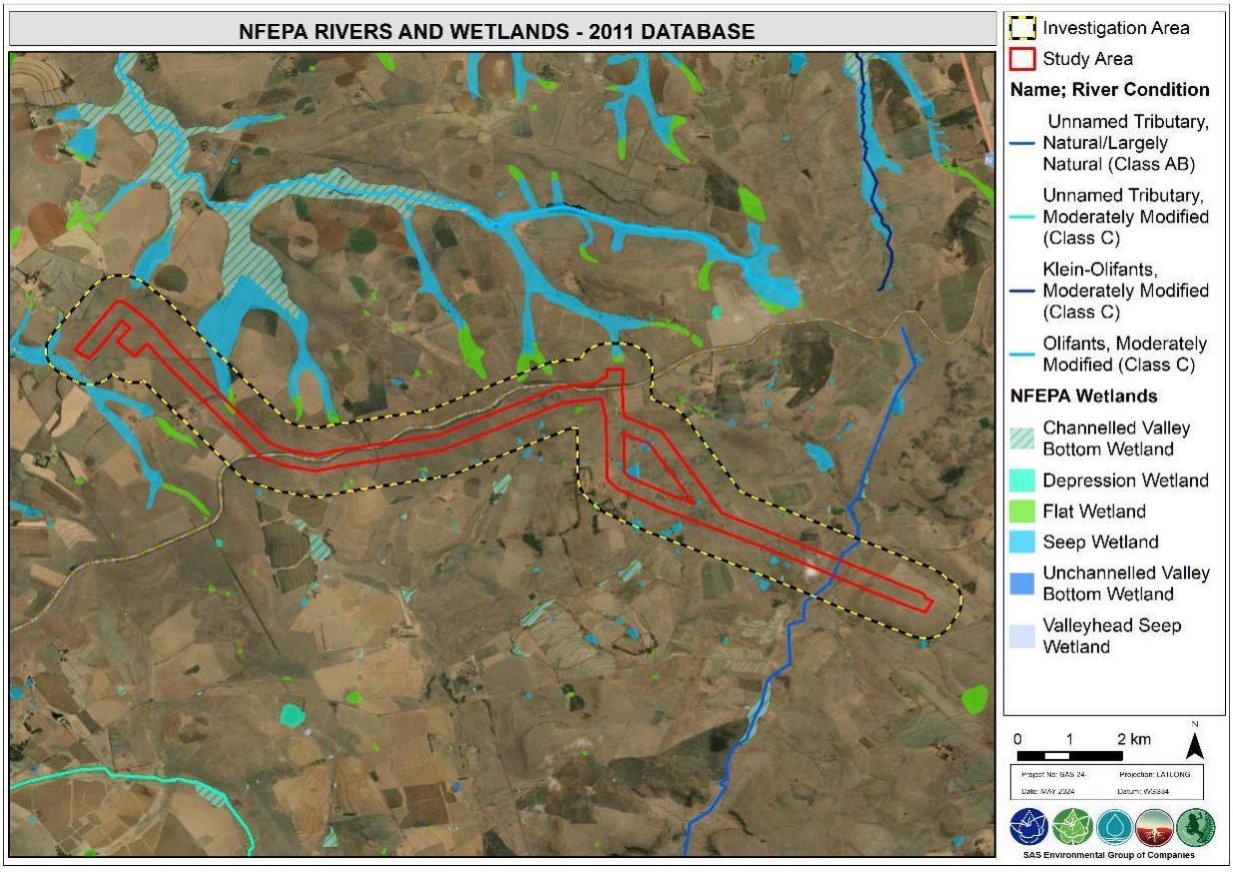


Figure 5-8 - Freshwater ecosystems associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area according to the NFEPA (2011) database.

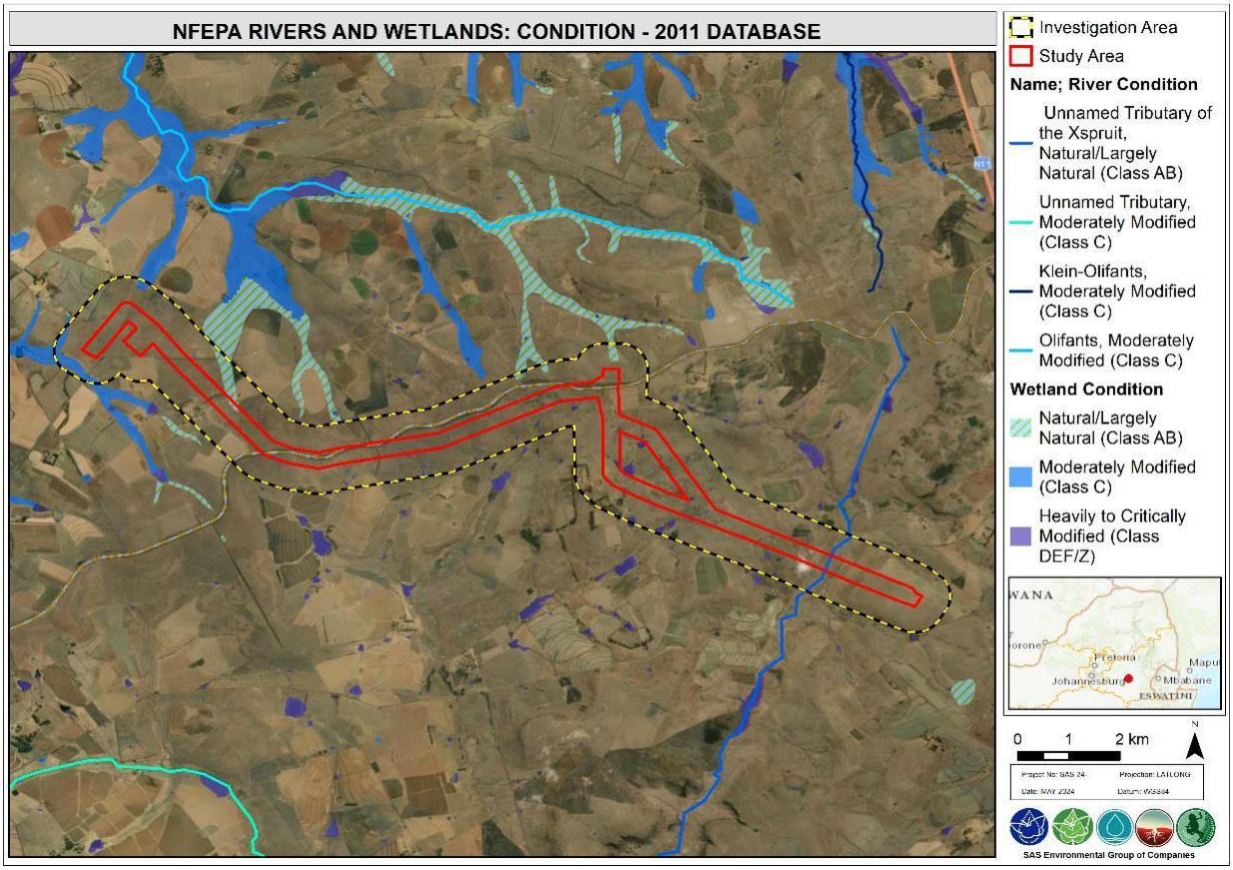


Figure 5-9 - Wetland ecological condition associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area according to the NFEPA database.

The NBA (2018) database like the NFEPA database, also indicates the presence of numerous channelled valley bottom (CVB) and seep wetlands, and one depression wetland. The CVB wetlands are largely in the western and eastern sections and are mostly indicated to be in a Largely to Critically Modified (Class D/E/F) ecological condition. The seep wetlands are indicated to largely be in a Moderately Modified (Class C) ecological condition and in a Largely to Critically Modified (Class D/E/F) ecological condition. The seep wetlands are indicated by the database to be Critically Endangered (ETS) and Poorly Protected (EPL). The one depression wetland is indicated to be of Least Concern (ETS), Natural/Near-Natural (PES Class AB), and Poorly Protected (EPL). The NBA Rivers database further indicates the unnamed tributary of Xspruit River traversing the study area in the east and is indicated to be in a near natural to natural (RIVERCON A/B) ecological condition, in a critically endangered (ETS), and poorly protected (EPL). The NBA Artificial Wetlands Database furthermore indicates numerous dams within the study and associated investigation area.

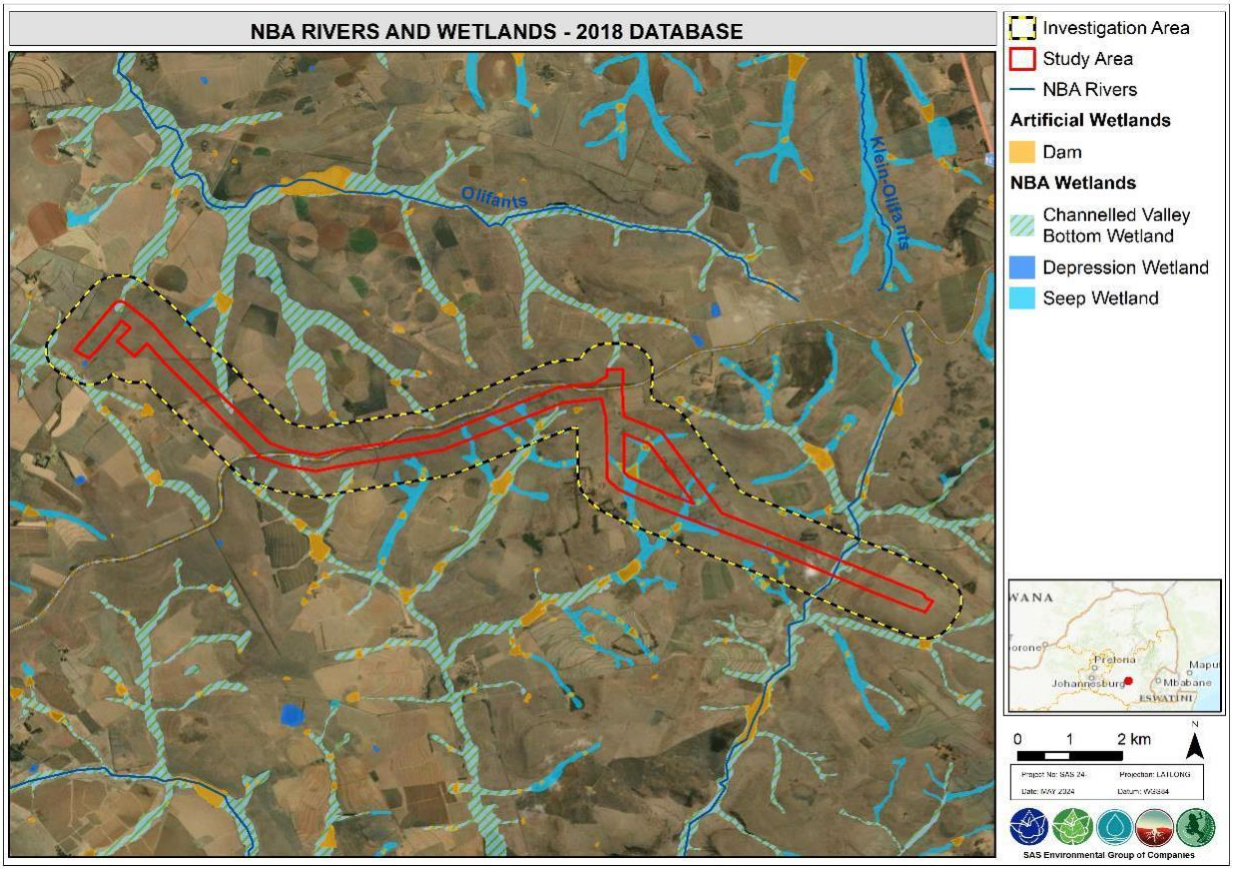


Figure 5-10 - Freshwater ecosystems associated with the proposed Phefumula Emoyeni One electrical grid infrastructure and associated investigation area according to the NBA (2018) database.

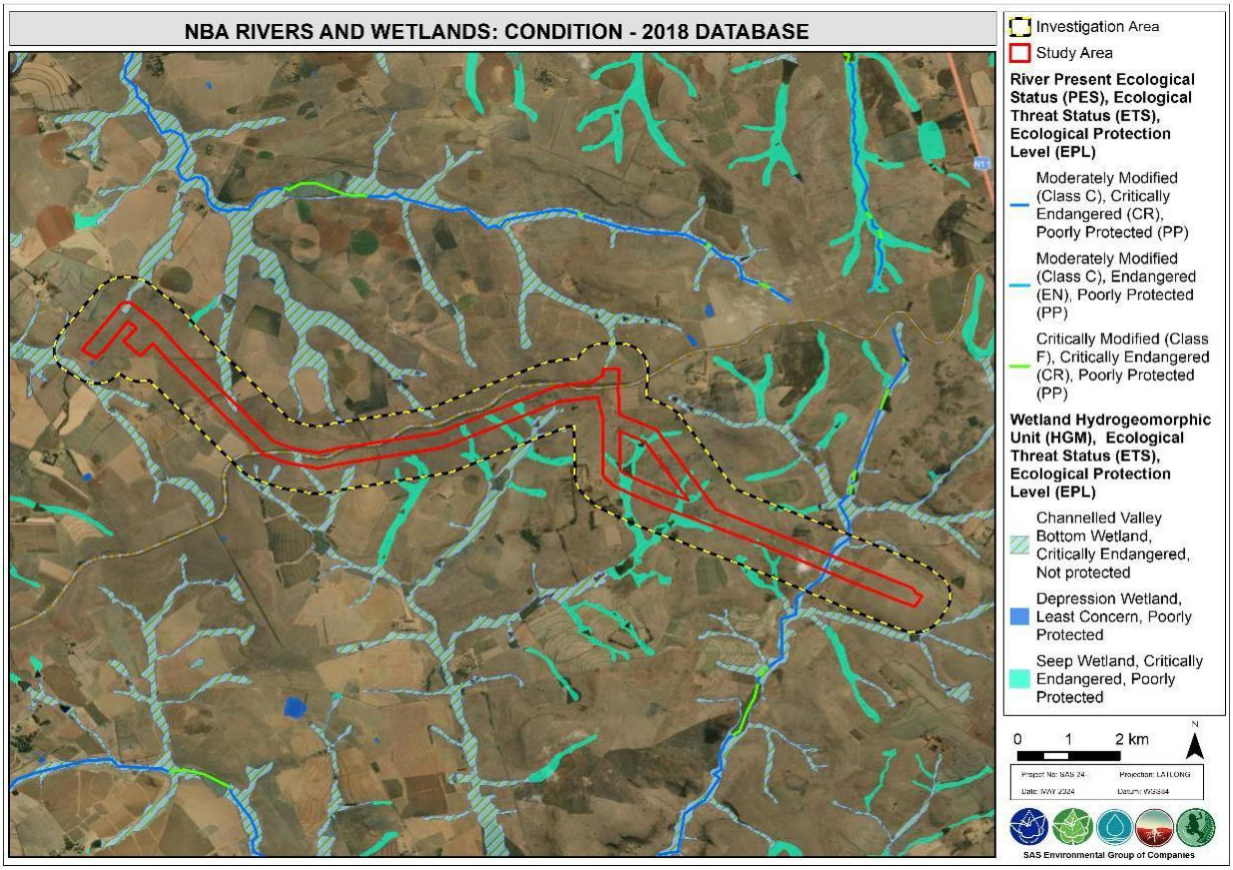


Figure 5-11 - River ecological condition associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area according to the NBA (2018) database.

The Mpumalanga Highveld Wetlands Database indicates the presence of several wetland types within the study and investigation area. The wetlands are indicated to be in a natural to near-natural (A/B) ecological condition seep and channelled valley bottom wetlands. One floodplain wetland and several artificial impoundments (dams) overlaying the seep wetlands largely are also indicated by the database.

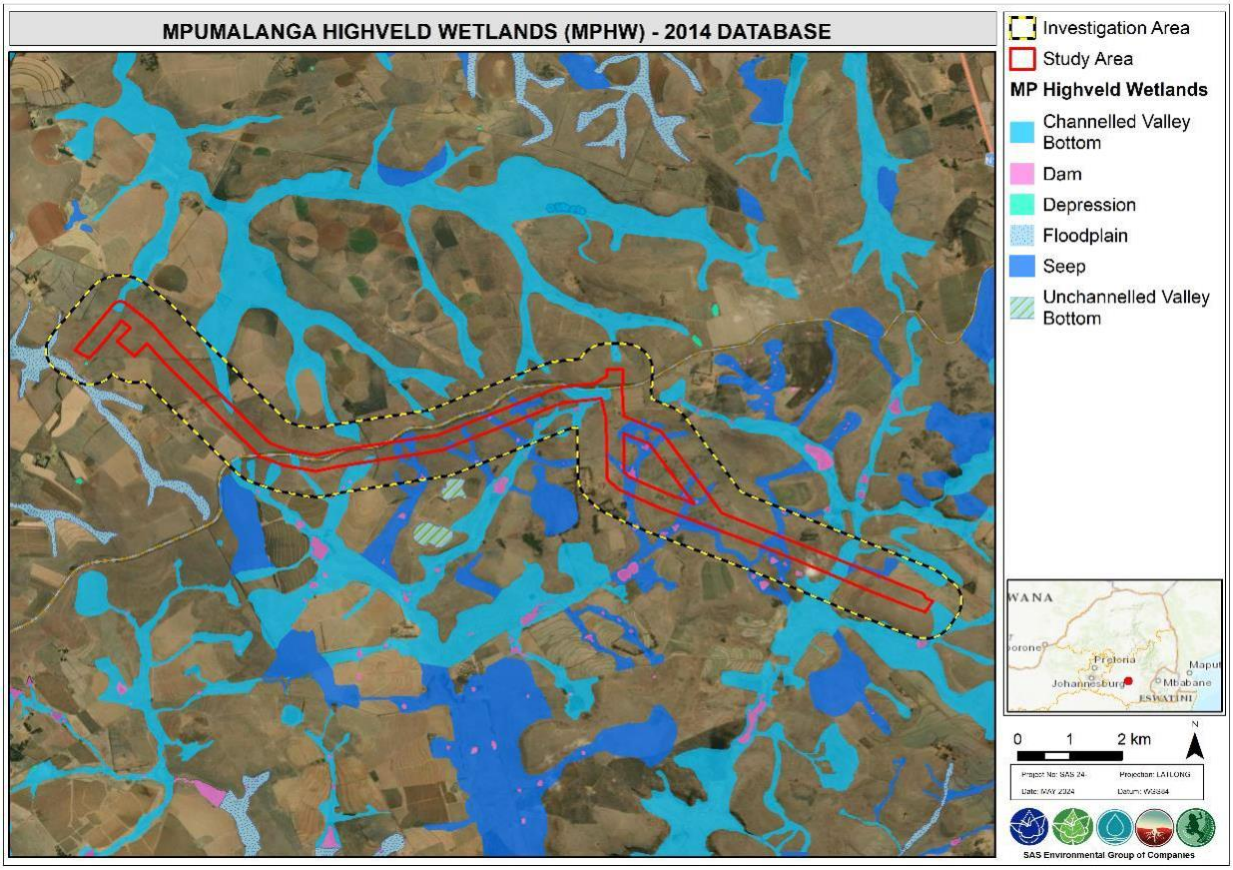


Figure 5-12 - Freshwater ecosystems associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area according to the Mpumalanga Highveld Wetlands database.

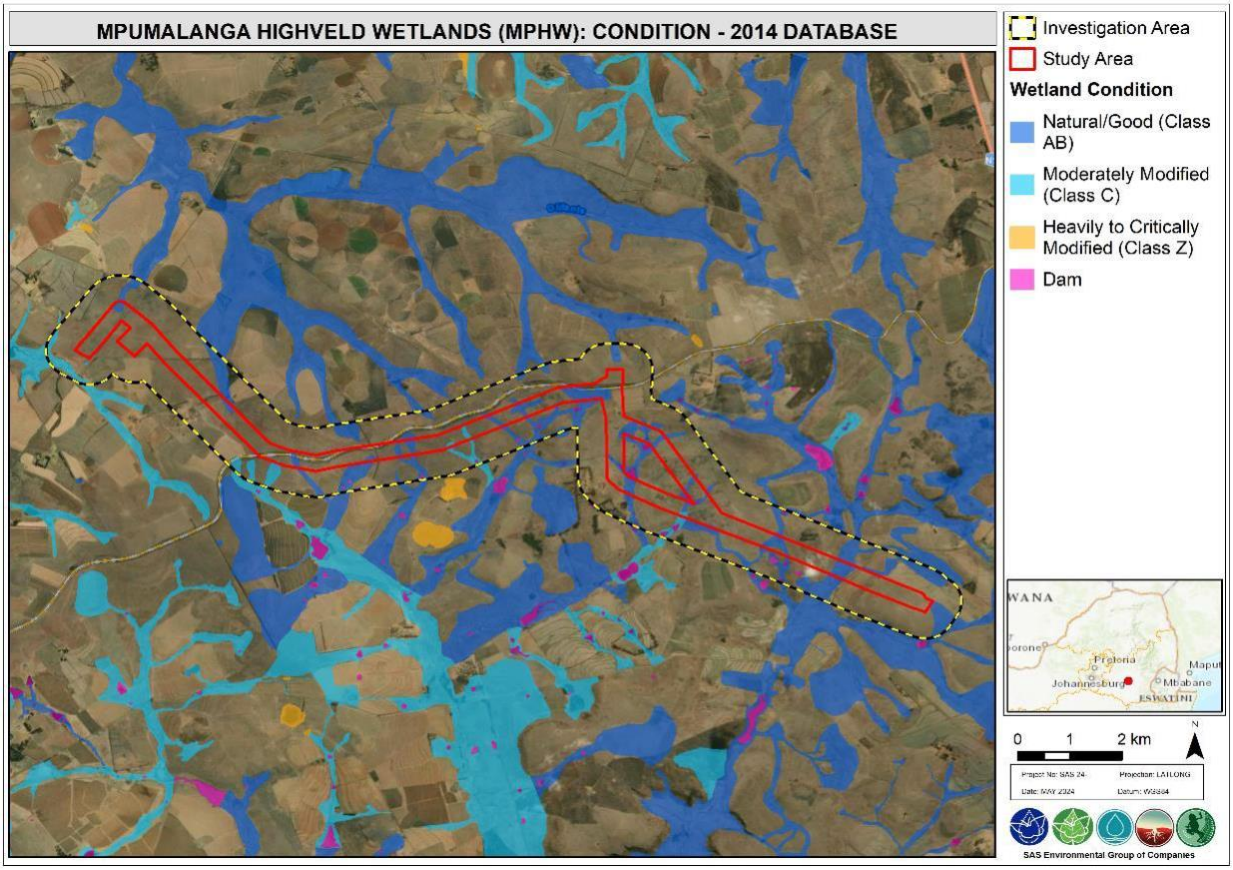


Figure 5-13 - Freshwater ecosystem condition associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and associated investigation area according to the Mpumalanga Highveld Wetlands database.

The areas adjacent to the unnamed tributary of the Xspruit River are indicated as Aquatic CBA River areas. Several sections of the channelled valley bottom wetlands (per the NBA: 2018 and MPHW: 2014 Databases) in the western sections of the investigation area as indicated as CBA Wetlands. CBA Areas that are required to meet biodiversity targets for species, ecosystems, or ecological processes. These include all areas required to meet biodiversity pattern targets and to ensure the continued existence and functioning of species and ecosystems, special habitats and species of conservation concern; Critically Endangered ecosystems; and critical linkages (corridor 'pinch-points') to maintain connectivity. CBAs are areas of high biodiversity value and need to be kept in a natural state, with no further loss of habitat or species.

The unnamed tributary of the Xspruit River, the seep wetlands, and the remaining CVB wetlands are indicated as ESA Wetlands. The study area and investigation area in the south and east as indicated by FEPA:2011 database as a Code 1 FEPA catchment is indicated by the Mpumalanga Biodiversity Sector Plan database as an ESA Important sub-Catchment. ESAs. ESAs are areas that are not essential for meeting targets, but that play an important role in supporting the functioning of CBAs and that deliver important ecosystem services. ESAs need to be maintained in at least a

functional and often natural state, supporting the purpose for which they were identified. They include features such as riparian habitat surrounding rivers or wetlands.

Patches of the study and investigation area in the central and western sections are indicated as Other Natural Areas (ONAs). ONAs are areas that have been identified as a priority in the current systematic biodiversity plan but retain most of their natural character and perform a range of biodiversity and ecological infrastructural functions.

Patches of the study and investigation area associated with agricultural areas are indicated as heavily modified areas. Heavily modified areas are those that have been heavily modified by human activity so that they are by-and-large no longer natural, and do not contribute to biodiversity targets. Some of these areas may still provide limited biodiversity and ecological infrastructural functions but, their biodiversity value has been significantly and, in many cases, irreversibly compromised.

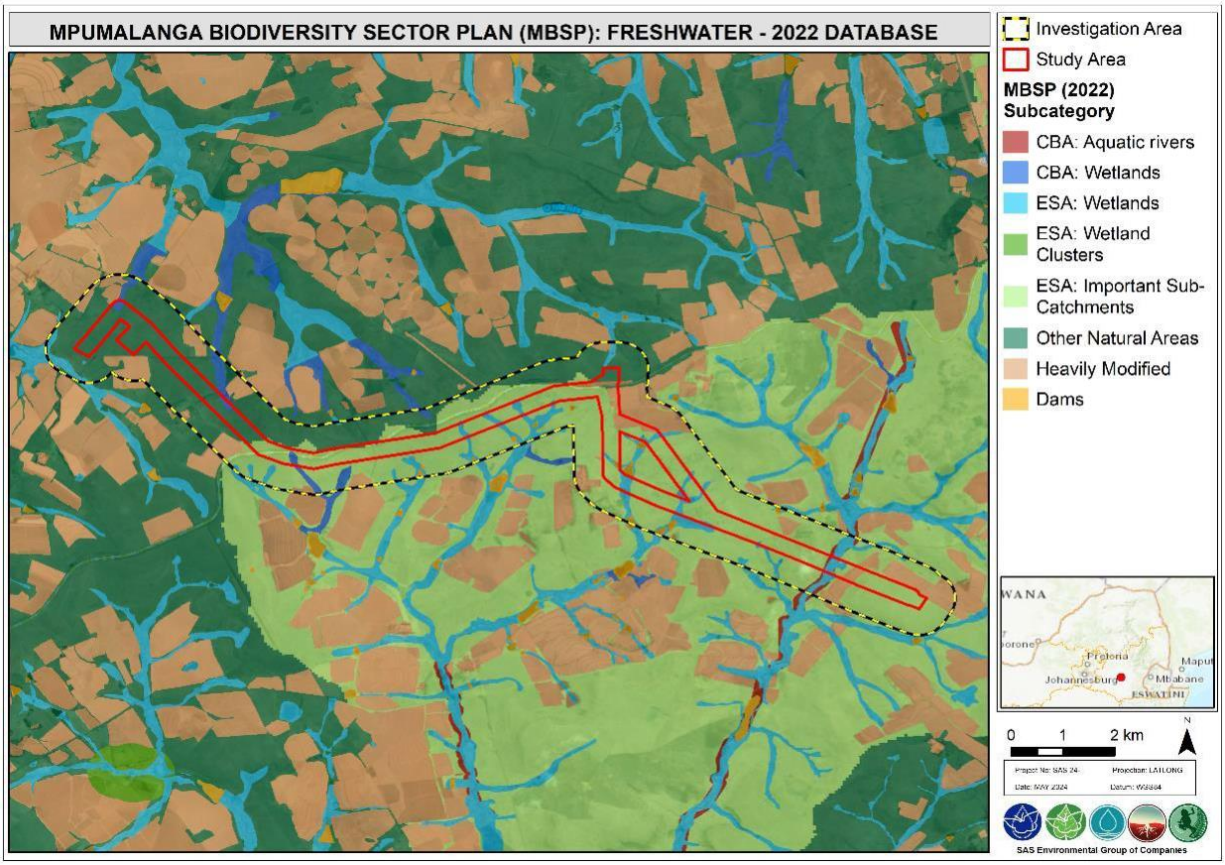


Figure 5-14 - Areas of freshwater ecological importance associated with the proposed Phefumula Emoyeni One electrical grid infrastructure study area and investigation area and associated investigation area is indicated by the Mpumalanga Biodiversity Sector Plan (2019).

5.2 BIOLOGICAL ENVIRONMENT

5.2.1 TERRESTRIAL VEGETATION

The proposed OHL assessment corridor primarily impacts Soweto Highveld Grassland, with only a small area of Eastern Highveld Grassland at the western end of the corridor impacted as shown in **Figure 5-15.**

Eastern Highveld Grasslands are found on slightly- to moderately undulating plains, low hills and wetland depressions (Mucina & Rutherford, 2011). Grasses are typical Highveld species from the genera *Aristida, Digitaria, Eragrostis and Tristachya. Indigenous woody species are mainly restricted to rocky areas and include Celtis africana, Protea caffra, Protea welwitschii, Diospyros lycioides, Searsia magalismontana and Senegalia caffra* (Mucina & Rutherford, 2011).

Soweto Highveld Grasslands are characterised by short to medium-high density tufted grassland occurring on gently to moderately undulating plains (Mucina & Rutherford, 2011). Grasslands are typically dominated by *Themeda triandra* along with several other co-dominant species. These grasslands are interrupted by small wetlands and rocky ridges and outcrops (Mucina & Rutherford, 2011).

According to the NEMBA Threatened Ecosystems (2021), both vegetation types are threatened; Eastern Highveld Grassland is listed as Endangered and Soweto Highveld Grassland is listed as Vulnerable.

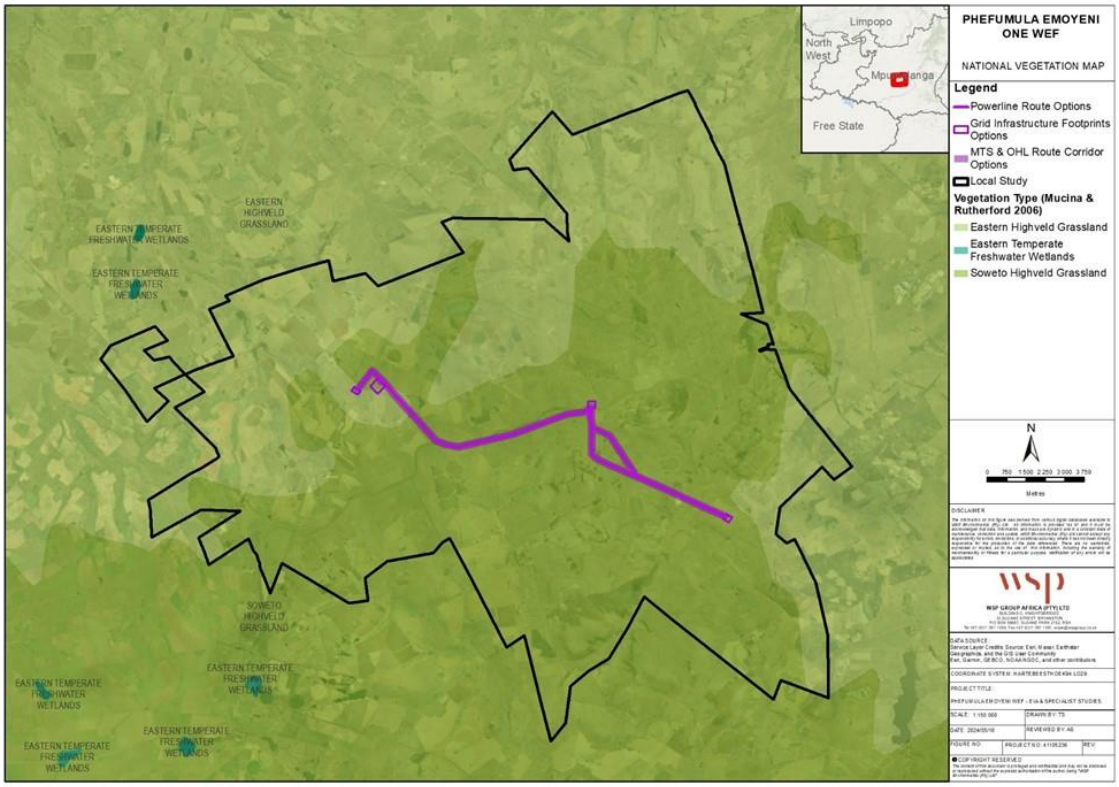


Figure 5-15 - Regional vegetation types associated with the study area.

Figure 5-16 shows the study area in relation to the delineation of national threatened ecosystems.

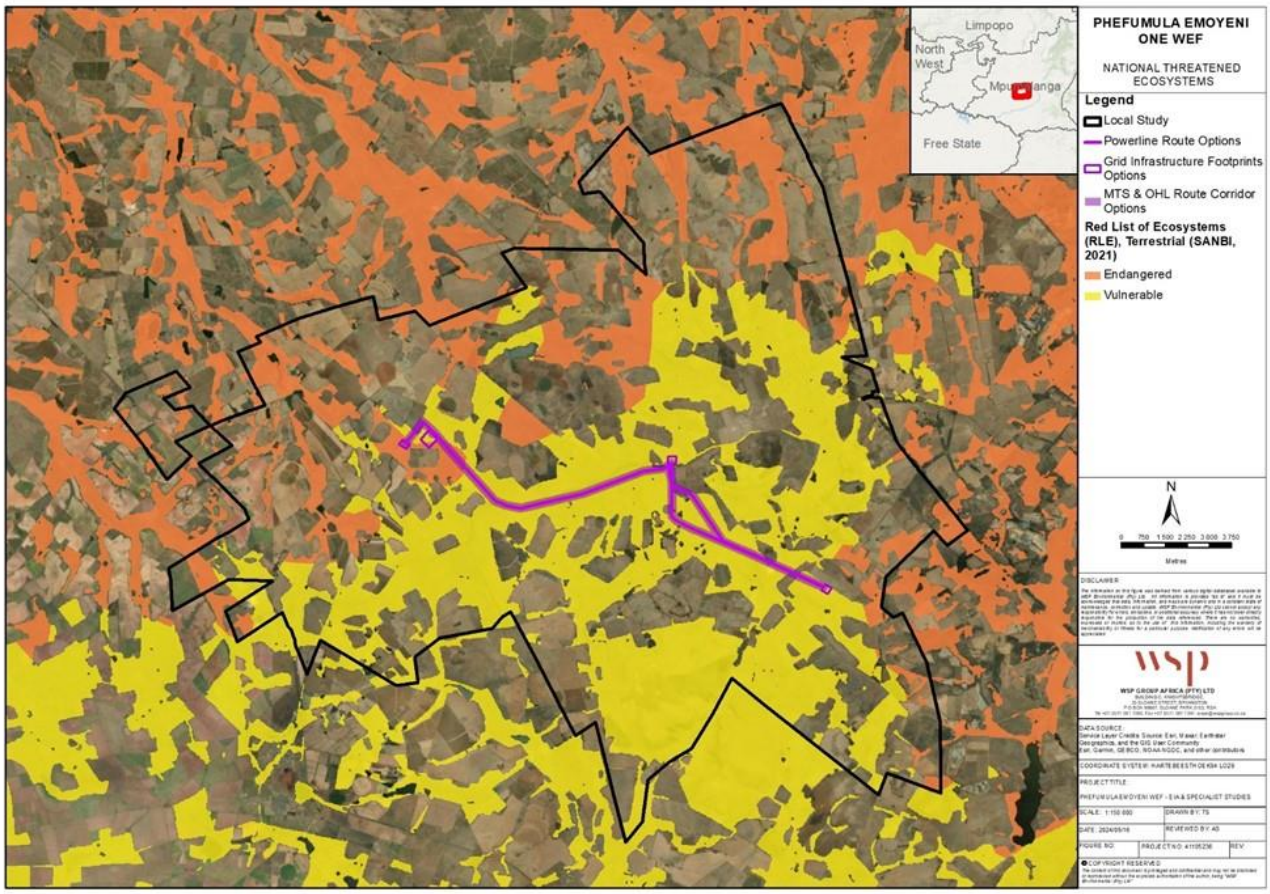


Figure 5-16 - Study area in relation to delineations of the National Red List of terrestrial ecosystems.

Flora Species of Conservation Concern

No flora species listed as threatened or Near Threatened on the national Red List were recorded in the study area during the field survey. However, *Kniphofia ensifolia subsp. ensifolia*, which is listed as Near Threatened on the Mpumalanga Red List was recorded in the study area.

Based on reviewed literature and data sources, 11 flora species that occur, or potentially occur in the study area, are listed as threatened or near threatened on the national and/or provincial Red Lists. These are listed in Table 6 of the Terrestrial Biodiversity report (**Appendix G.3**) along with their conservation statuses, habitat preferences, and a probability of occurrence (based on field observations or habitat suitability assessments).

Several flora species that are listed as protected at a provincial level according to Mpumalanga Nature Conservation Act (Act No. 10 of 1998) were recorded in the study area during the field

survey, including *Aloe ecklonis, Boophone disticha, Crinum bulbispermum, Gladiolus crassifolius, Gladiolus longicollis subsp. platypetalus, Gladiolus sericeovillosus subsp. calvatus and Haemanthus humilis.* It is possible that protected flora will occur within the development footprints of the proposed Project, and that these may be impacted by construction activities.

5.2.2 TERRESTRIAL CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS

The MBSP technical report (Lotter, 2015) defines five categories of conservation focus; protected areas, CBA, ESA, other natural areas, and modified habitats. Definitions for each are listed below:

- **Protected Areas**: protected areas recognised in terms of the National Environmental Management Protected Areas Act, No. 57 of 2003, that are currently considered to meet biodiversity targets in the MBSP.
- **Critical Biodiversity Area**: areas (outside of Protected Areas) that are required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. They should remain in a natural state that is maintained in good ecological condition. The MBSP recognises two CBA ranks, viz, CBA Irreplaceable and CBA Optimal (these are alternatively referred to as CBA 1 and CBA 2, respectively).
- **Ecological Support Area**: play an important role in supporting the ecological functioning of critical biodiversity areas or for generating or delivering important ecosystem services. They support landscape connectivity and resilience to climate change adaptation. They need to be maintained in at least an ecologically functional state, but some limited habitat loss may be acceptable.
- **Other Natural Areas**: often retain much of their natural character and may contribute significantly to maintenance of viable species populations and natural ecosystem functioning, and may provide important ecological infrastructure and ecosystem services. They are not, however, prioritized for immediate conservation action in the MBSP.
- **Modified:** often referred to as transformed, these areas have lost a significant proportion (or all) of their natural biodiversity and in which ecological processes have broken down (in some cases irretrievably), as a result of biodiversity-incompatible land-use practices such as ploughing, hardening of surfaces, mining, cultivation and the construction of houses or other built infrastructure.

Figure 5-17 shows the study area and the proposed Project site in relation to the delineations of the MBSP (2022). It is evident that the OHL assessment corridor traverses across large tracts of land designated as CBA Irreplaceable (CBA 1), with smaller patches of CBA Optimal (CBA 2) and to a lesser extent ESA, also potentially affected. As per data received from the MPTA (M. Lötter), the CBA patches across the broader study area are predicated on a combination of the following criteria:

- Eastern Highveld Grassland;
- Soweto Highveld Grassland;
- Mesic Highveld Grassland– Groups 1-3;
- Intact grassland patches;

- Several fauna SCC:
  - Giant Bullfrog (*Pyxicephalus adspersus*);
  - Blue Korhaan (*Eupodotis caerulescens*);
  - Rudd's Lark (*Hateromirafra ruddi*);
  - Botha's Lark (*Spizocorys fringillaris*);
  - White-bellied Korhaan (*Eupodotis senegalensis*);
  - African Grass Owl (*Tyto capensis*);
  - Oribi (*Ourebia ourebi ourebi*);
- Climate change land facets;
- Macro-corridor;
- Critical linkages;
- Three flora SCC:
  - *Aspidoglossum xanthosphaerum;*
  - *Khadia carolinensis;*
  - *Brachycorythis conica subsp. transvaalensis;*
- Core and supporting corridors.

The continued integrity and protection of these CBA's is required to meet biodiversity targets for biodiversity pattern (species and ecosystems) and ecological processes. The presence of CBA Irreplaceable and CBA Optimal land in the study area is therefore a concern with respects to terrestrial biodiversity management.

As per the MBSP, development in CBA areas should be avoided, and it is recommended that as far as possible no proposed Project infrastructure should be sited on land designated CBA Irreplaceable and CBA Optimal. It is noted that portions of the proposed OHL assessment corridor are aligned with existing linear infrastructure (i.e., district road, farm tracks, and old railway line) which are characterised by transformed/disturbed peripheries, and thus there may be scope to micro-site some of the proposed OHL infrastructure footprints to already disturbed areas.

With respects to ESA areas, a greater range of land uses is permissible in such areas. However, the functional state of these areas should not be compromised by proposed Project infrastructure or activities.

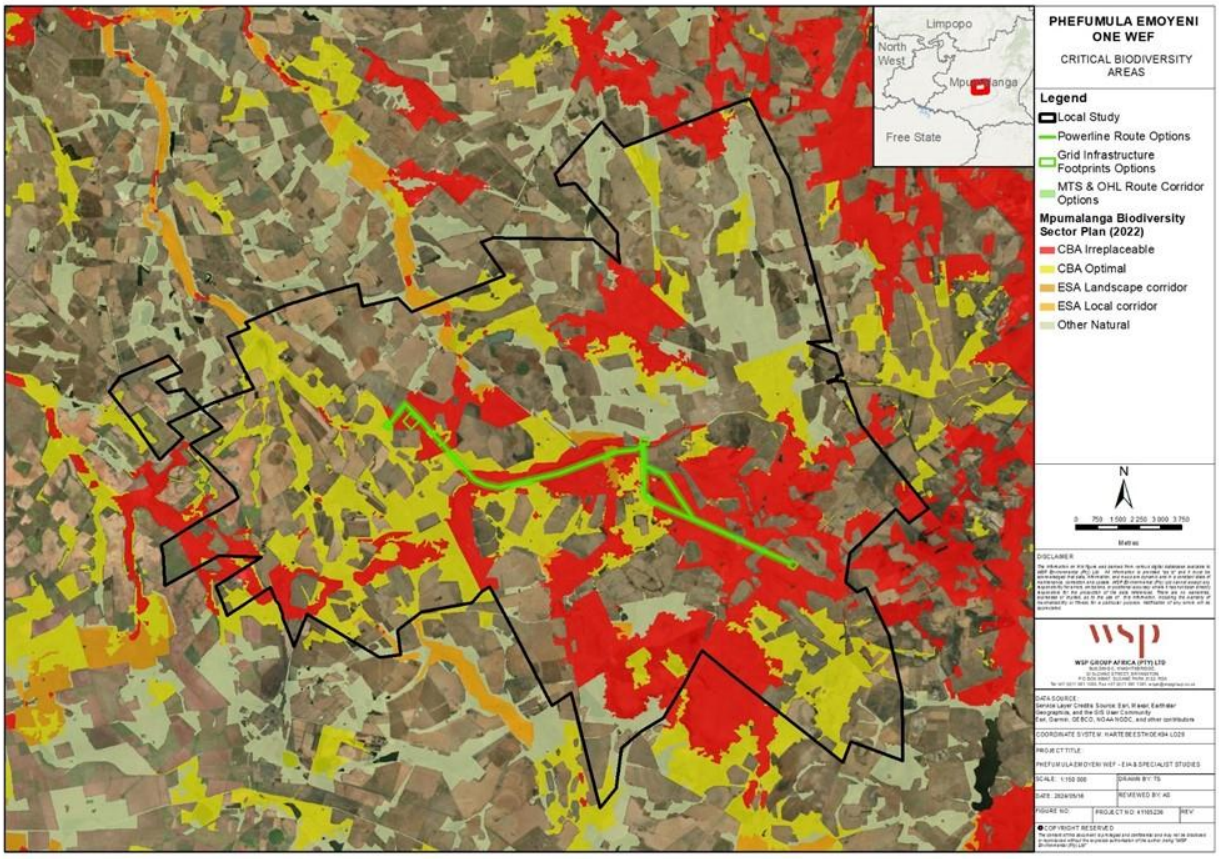


Figure 5-17 - Study area in relation to the delineations of the Mpumalanga Biodiversity Sector Plan (2022)

Priority Focus Areas for Protected Area Expansion

Priority Focus Areas for protected area expansion are large, intact and unfragmented areas of high biodiversity importance, that are suitable for the creation/expansion of protected areas (Driver, *et al.,* 2012). Land-use planning and decision making should avoid fragmenting Priority Focus Areas, to prevent such areas from being excluded from future protected area expansion. (Driver, *et al.,* 2012).

Figure 5-18 and **Figure 5-19** shows the proposed OHL assessment corridor in relation to the mapped Priority Focus Areas of the National Protected Area Expansion Strategy (2018) and the Mpumalanga Protected Area Expansion – 20 Year Plan. It is evident that the proposed corridor traverses across Priority Focus Areas recognised under both spatial datasets.

Priority Focus Areas for protected area expansion are large, intact and unfragmented areas of high biodiversity importance, that are suitable for the creation/expansion of protected areas (Driver, et al., 2012). Land-use planning and decision making should avoid fragmenting Priority Focus Areas, to prevent such areas from being excluded from future protected area expansion. (Driver, *et al.,* 2012).

According to the National Protected Area Expansion Strategy (2018), large portions of habitat in the study area have been mapped as Priority Focus Areas for protected area expansion (**Figure 5-18**).

Similarly, the delineations presented in the Mpumalanga Protected Area Expansion – 20 Year Plan indicate that large portions of the study area are designated as Priority 2 and Priority 3 areas for protected area expansion - shown in **Figure 5-18.**

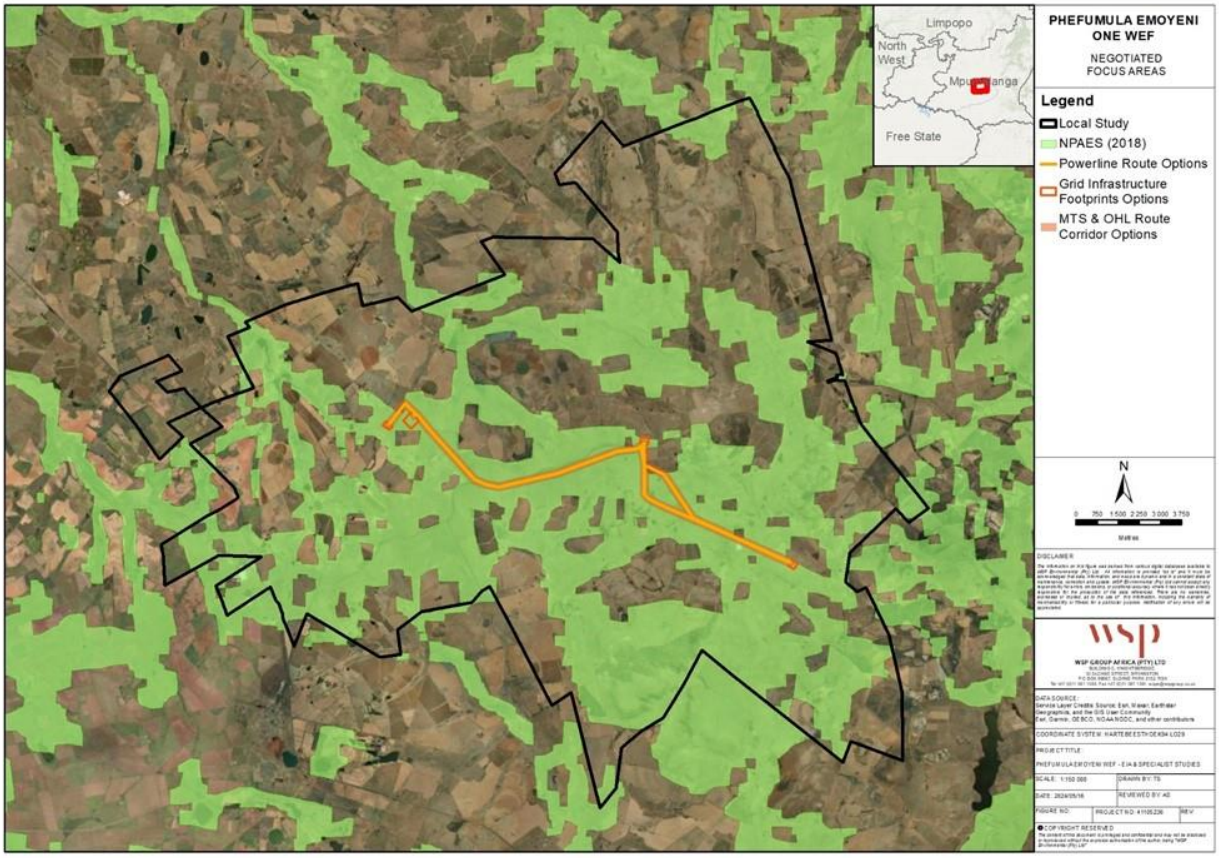


Figure 5-18 - Study area in relation to the delineation of the National Protected Area Expansion Strategy (2018)

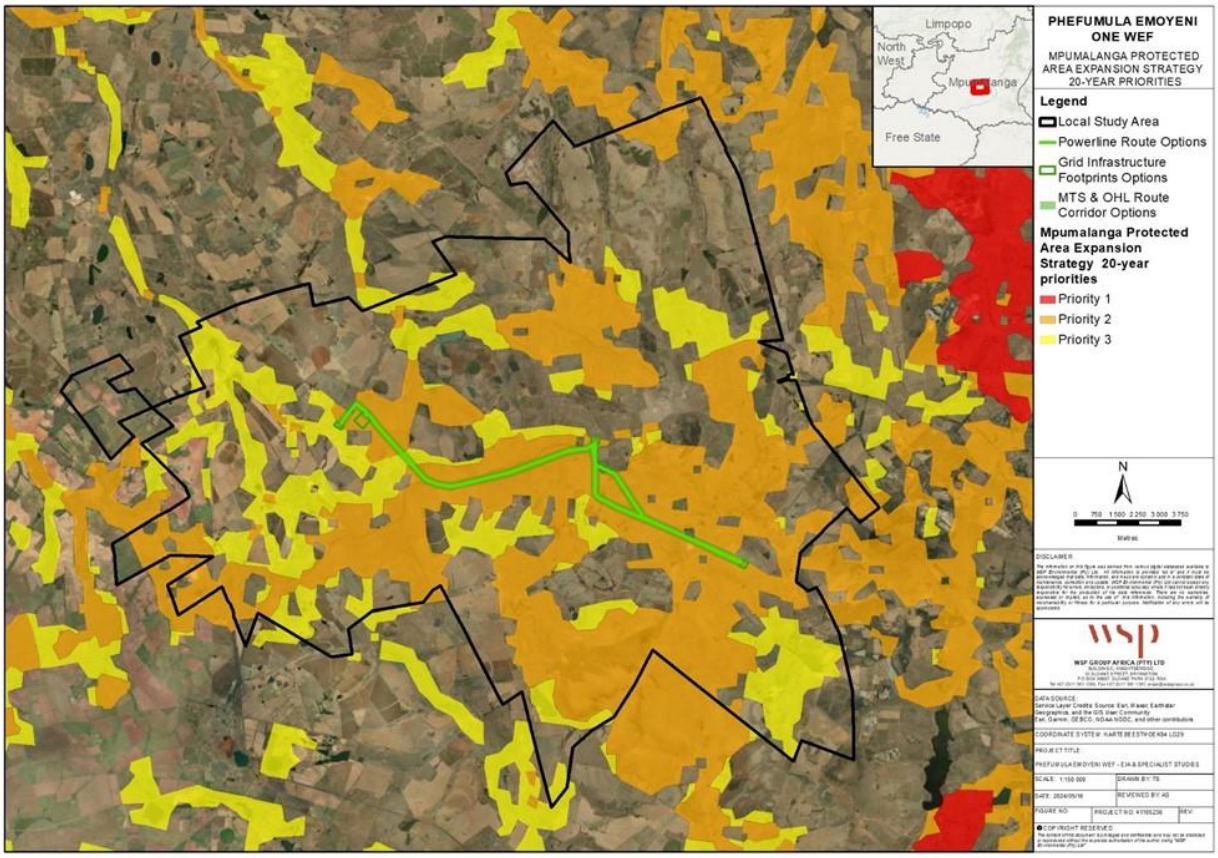


Figure 5-19 - Study area and grid connection assessment corridor/footprints in relation to the delineation of the Mpumalanga Protected Area Expansion Strategy – 20 Year Plan

Freshwater Ecosystem Priority Area Sub-Catchment

Freshwater Ecosystem Priority Areas (FEPA) are rivers and wetlands required to meet biodiversity targets for freshwater ecosystems. Essentially, these areas were identified at a national level as priority areas for conserving freshwater ecosystems and supporting the sustainable use of water resources, as well as upstream catchment management areas (Driver *et al.,* 2012).

Figure 5-20 shows the study area in relation to mapped FEPA's. It is evident that the south-eastern portion of the OHL assessment corridor traverses across a designated FEPA. According to Driver, *et al.,* (2012), FEPA's should be maintained in a natural/near natural condition, and anthropogenic activities in Upstream Management Areas should be carefully managed to prevent degradation of downstream FEPA's.

According to Driver *et al.,* (2012), FEPAs should be maintained in a natural/near natural condition, and anthropogenic activities in Upstream Management Areas should be carefully managed to prevent degradation of downstream FEPAs.

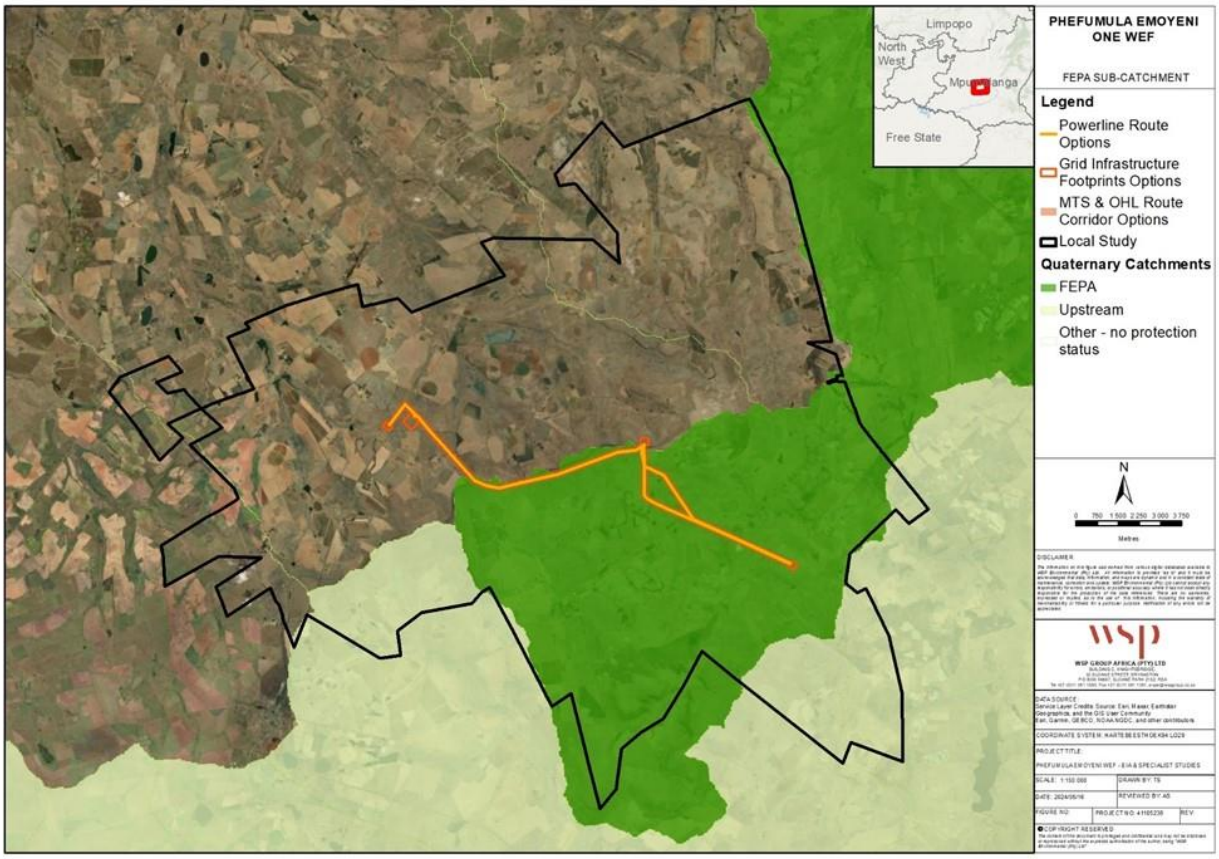


Figure 5-20 - Study area in relation to Freshwater Ecosystem Priority Areas.

Strategic Water Source Areas

The study area is not located within a mapped Strategic Water Source Area (SWSA). The nearest SWSA is located to the south-west of the study area.

Indigenous Forests

No indigenous forest habitat occurs within the study area. The study area is dominated by cultivated fields and tracts of natural grassland and wetland habitat.

Protected Areas and Conservation Areas

The study area is not located within or in close proximity to a protected area. The closest include:

- Rietvlei Private Nature Reserve, which is located to the south of the N17 national road, approximately 12 km south of the study area;
- Ahlers Private Nature Reserve, which is located approximately 14 km south-east of the study area; and
- Chrissiesmeer Protected Environment, which is located approximately 30km west of the study area.

5.2.3 TERRESTRIAL FAUNA SPECIES

Mammals

During the field survey, 19 mammal species were documented for the study area (Table 7 of Terrestrial Biodiversity Scoping Report, **Appendix G.3**). The recorded mammal's range in size from small rodents to medium-sized antelope, and apart from the Blesbok (*Damaliscus pygargus phillipsi*), which is an actively-managed taxon, all are free-roaming species.

Four of the recorded mammal species are listed on the national mammal Red List (Child *et al.,* 2016), namely Mountain Reedbuck (*Redunca fulvorufula fulvorufula*) - Endangered, Serval (*Leptailurus serval*) – Near Threatened, Cape Clawless Otter (*Aonyx capensis*) - Near Threatened, and Swamp Musk Shrew (Crocidura mariquensis) - Near Threatened. A number of the recorded taxa are also listed as either nationally and/or provincially protected (listed in Appendix C of Terrestrial Biodiversity Scoping Report, **Appendix G.3**).

Three mammal species were highlighted by the web-based screening tool as potentially sensitive features for the study area, namely the Spotted-necked Otter (*Hydrictis maculicollis*) - Vulnerable, Maquassie Musk Shrew (*Crocidura maquassiensis*) – Vulnerable, and Oribi (*Ourebia ourebi ourebi*) - Endangered. These taxa were not observed during the field survey. However, habitat suitability assessments indicate that it is 'probable' that the Spotted-necked Otter is present in the study area, while the probability of occurrence of the Maquassie Musk Shrew and Oribi in the study area are considered 'unlikely', and 'unlikely/possible' respectively.

Reviewed literature and datasets also indicate that an additional 24 are species of conservation concern potentially occur in the study area. These are also listed in Appendix C of Terrestrial Biodiversity Scoping Report, **Appendix G.3**.

Birds

Reviewed literature indicates that about 22 bird SCC are known to occur in the region in which the study area is located. These include 20 species listed as threatened/Near Threatened on the regional Red List (Taylor, *et al.,* 2015), ten species listed on the NEMBA ToPS list (2007), and 22 species are listed as either threatened or protected at a provincial level.

During the 2024 field survey, six bird SCC were recorded in the study area as opportunistic observations, namely the Blue Crane (*Anthropoides paradiseus*) – Near Threatened, Lesser Flamingo (*Phoeniconaias minor*) - Near Threatened, Greater Flamingo (*Phoenicoperus roseus*) - Near Threatened, Southern Bald Ibis (*Geronticus calvus*)- Vulnerable, Yellow-billed Stork (*Mycteria ibis*) – Endangered, and Blue Korhaan (*Eupodotis caerulescens*) - Near Threatened (MP).

For a screening list of all bird SCC that potentially occur in the study area refer to Appendix C of the Terrestrial Biodiversity Scoping Report, **Appendix G.3**. For more detailed assessment of birds, refer to the bird specialist scoping study for the proposed Project (**Appendix G.4**).

Herpetofauna

Herpetofauna observed in the study area during the field survey include the Common River Frog (*Amieta delalandii*), Water Monitor (*Varanus niloticus*) and Rinkhals (*Hemachatus haemachatus*). Anecdotal evidence from a local farmer indicate that other common encountered species include the

Mole Snake (*Pseudaspis cana*) and Red-lipped Snake (*Crotaphopeltis hotamboeia*). These are all common and widespread species.

Based on distribution records, six reptile species of conservation concern potentially occur in the study area. These are all listed on the Mpumalanga Red List. None of these species are listed as threatened/Near Threatened on the regional Red List.

One amphibian of conservation concern, namely the Giant Bullfrog (*Pyxicephlaus adspersus*) potentially occurs in the study area. This is also not listed as threatened on the regional Red List. It is however, listed as Protected on the NEMBA ToPS list (2007) and according to the Mpumalanga Nature Conservation Act (Act No. 10 of 1998). For a list of fauna SCC that potentially occur in the study area refer to Appendix C of the Terrestrial Biodiversity Scoping Report (**Appendix G.3**). It is possible that herpetofauna SCC, including the Giant Bullfrog, occur in the study area.

Invertebrates

Three invertebrate species of conservation concern potentially occur in the study area. These are The Potchefstroom Blue (*Lepidochrysops procera*) – Rare, Roodepoort Copper (*Aloeides dentatis maseruna*) – Rare (MP) and the Marsh Sylph (*Metisella meninx*) – Near Threatened. It is possible that these SCC occur in the study area and may be impacted by the proposed Project.

5.2.4 LANDCOVER

According to GeoTerra Land Cover Imagery (2020) of the study area indicates that large patches of the study area comprise cultivated land. These areas are likely to be either actively cultivated and therefore denuded of natural vegetation or lying fallow (old lands) and dominated by secondary vegetation dominated by ruderal, pioneer indigenous and alien flora species.

Existing impacts and key drivers of change that were observed in the study area during the field survey, and that are likely to influence ecosystem dynamics and functioning and the distribution of fauna and flora species in the study area are discussed below. Maps showing the major land cover types as per exiting spatial data, are presented in **Figure 5-21** and **Figure 5-22.**

Farming is the dominant land use within the study area, and well as across the surrounding landscape. Irrigated and dry-land cultivation, coupled with livestock production (mostly cattle, but also sheep) are the primary farming activities and these, over the long term, have caused varying degrees of spatial habitat modification and disturbance.

Mining operations are present to the south-east and north of the study area. Mined areas are either completely transformed with typically no natural habitat remaining or comprise habitat that is highly disturbed.

Various forms of linear infrastructure are present in the study area and broader landscape, including major national roads (N11 and N17), several gravel district roads, farms roads and informal vehicle tracks, a defunct railway line, and numerous farm fences. To varying degrees, and in conjunction with transformative land uses activities, linear infrastructure has caused habitat fragmentation across the study area, although it is noted the large intact habitat patches remain present.

Alien invasive species are present in the study area. Many localised alien tree stands are present, and typically comprise *Acacia mearnsii, Acacia dealbata, Eucalyptus camaldulensis and Populus x*

canescens. It was also noted that the edges of many cultivated fields as well as other disturbed sites are encroached by various herbaceous AIS (e.g., *Verbena bonariensis*).

Other anthropogenic activities and infrastructure in the study area that have resulted in habitat loss and disturbance include inter alia, farm residences and various agriculture structures (barns).

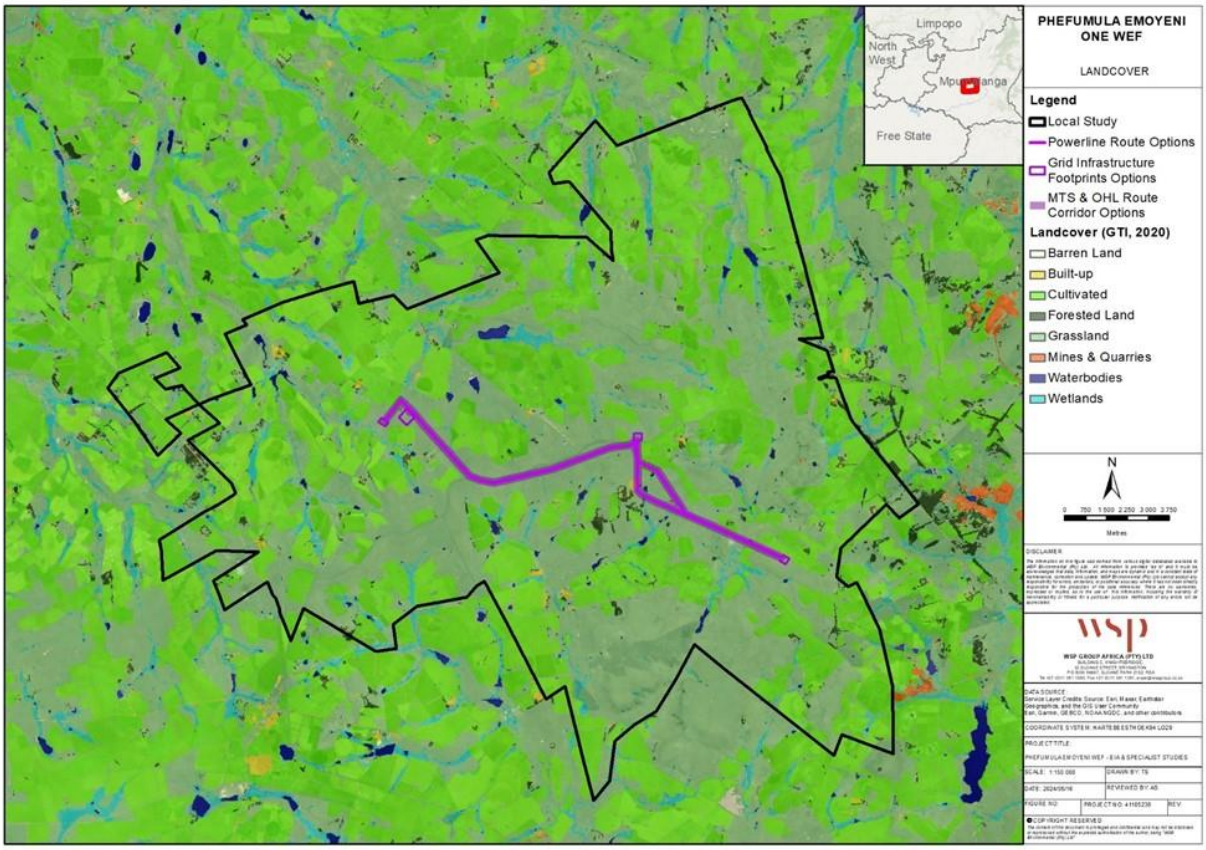


Figure 5-21 - Landcover associated with the study area and surrounding landscape.

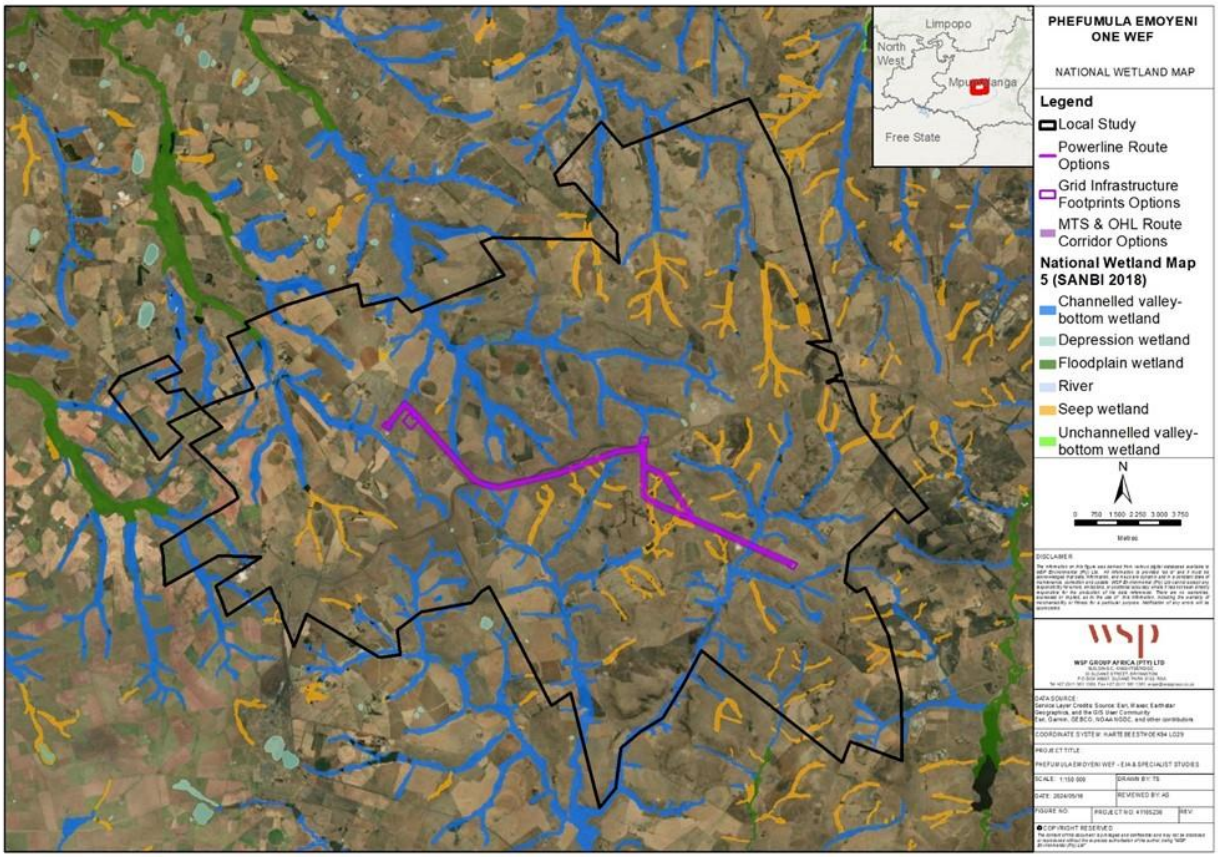


Figure 5-22 - Wetland in the study area, as per SANBI (2018)

5.2.5 HABITATS

Seven habitat units were identified in the study area during the field survey. These include four units regarded as natural habitat, and two units regarded as modified habitats:

- **Natural Habitats**
  - Mixed Dry Grassland;
  - Rocky Shrubland;
  - Moist Grassland;
  - Old Lands;
- **Modified Habitats**
  - Cultivated Fields; and
  - Alien Tree Plantations.

Mixed Dry Grassland

Mixed Dry Grassland is a variable habitat unit that characterises the large intact grasslands of the study area. Based on contemporary and former farming activities, disturbance levels in areas of Dry Mixed Grassland vary.

As per Edwards (1983) structural classification system, the vegetation structure of this unit is defined a low closed grassland (**Figure 5-23**). Compositionally, areas of Mixed Dry Grassland are characterised by a diverse flora assemblage, that is typically grass dominated and forb rich, and with woody species generally occurring as scattered individuals.

Predicated on past livestock grazing levels and wildfire patterns, the grass species composition of these grasslands varies. Areas that have likely experienced high-levels of past grazing and/or too frequency wildfires tend to be dominated by early-seral grass species, such as *Eragrostis plana and Eragrostis chloromelas*, whereas in areas that have been less intensely grazed or burnt, climax grass species such *as Themeda triandra* and other species including inter alia; *Cymbopogon pospischilii, Eragrostis racemosa, Harpochloa falx, Setaria species and Tristachya leucothrix* are common.

Common herbs/forbs recorded in the Mixed Dry Grassland unit include inter alia*; Berkheya pinnatifida subsp. ingrata, Berkheya radula, Berkheya setifera, Haplocarpha scaposa, Hilliardiella aristata various Helichrysum and Hypoxis species and Nidorella podocephala*. Woody species occur at low abundances in areas of Mixed Dry Grassland and typically include scattered *Diospyros lycioides and Seriphium plumosum* shrubs. Higher abundances of *Seriphium plumosum* were noted at certain locations and are likely a result of historic localised overgrazing. In terms of declared alien invasive species *Verbena bonariensis and Verbena rigida.*

Sensitivity Aspects

Mixed Dry Grasslands characterises large intact portions of the study area, and they are important in maintaining the landscape-scale ecological processes that support terrestrial biodiversity. Several protected flora species were recorded in this unit, and it is likely that several additional flora species of conservation concern (SCC) are present. These grasslands are also vital fauna habitat, and will support many of the fauna SCC known from the region.

Figure 5-23 - Mixed Dry Grassland in the study area

Rocky Shrubland

This habitat unit occurs along rocky hillside slopes/ridges in the study area, but is not present within the proposed Grid Connection assessment corridor/footprints. Unlike adjacent areas of open dry and moist grassland, this unit is characterised by an abundance of indigenous woody vegetation, coupled with the presence of large protruding rocks (**Figure 5-24**).

In line with Edwards (1983) structural classification, this habitat unit comprises low- to short sparse shrubland, with woody vegetation occurring as small trees and shrubs (typically < 3m in height) growing in either dense but spatially discrete aggregations around protruding rocks, or as scattered individual small trees and shrubs, within the broader grassland matrix.

Compositionally, *Diospyros lycioide*s is the most abundant woody species. Other common larger woody taxa recorded in this unit include *Asparagus laricinus, Euclea crispa, Gymnosporia buxifolia, Kiggelaria africana, Rabdosiella calycina, Searsia dentata, Searsia discolor and Searsia pyroides var. gracilis.*

The herbaceous layer shares many of the same flora species as adjacent areas of Mixed Dry Grassland, as well as several additional taxa. Commonly recorded grasses include *Cymbopogon pospischilii, Eragrostis chloromelas, Eragrostis plana, Eragrostis pseudosclerantha, Hyparrhenia dregeana, Melinis nerviglumis, Themeda triandra* and *Tristachya leucothrix.* Various forbs, geophytes and small shrublets are also common in the herbaceous layer including inter alia; *Berkheya radula, Haemanthus humilis, Hilliardiella aristata, Haplocarpha scaposa, Helichrysum rugulosum, Phylica paniculata, Ledebouria ovatifolia* and *Leonotis dysophylla.* Ferns recorded in this unit include *Blechnum cf. australe, Cheilanthes hirta var. hirta, Pellaea calomelanos var. calomelanos* and *Selaginella dregei*.

Sensitivity Aspects

Due to the combination of indigenous woody vegetation and protruding rocks, Rocky Shrubland habitat is unusual within the context of the general open grassland matrix of the study area. Patches of Rocky Shrubland habitat therefore increase landscape-scale habitat heterogeneity, and provide important niche habitat for a variety of flora and fauna species that show an affinity for hilly and well-wooded rocky areas. Included amongst these, are species of conservation concern.

Figure 5-24 - Rocky Shrubland.

Moist Grassland

Moist Grassland habitat characterises wetland and riparian features across the study area. Vegetation structure ranges from low to tall closed grassland (sensu. Edwards 1983), and although not widespread or abundant in most areas of Moist Grassland, alien woody vegetation is present and well-established in certain locations (Figure 5-25).

Common flora species recorded include a range of grasses and sedges such as, inter alia*; Agrostis lachnantha, Andropogon appendiculatus, Arundinella nepalensis, Cyperus congesta, Cyperus denudatus, Cyperus fastigiatus, Cyperus marginatus, Cynodon dactylon, Eleocharis limosa, Eragrostis gummiflua, Eragrostis heteromera, Eragrostis plana, Imperata cylindrica, Juncus dregeanus, Kyllinga erecta, Leersia hexandra* and *Paspalum dilatatum*. The tall reed *Phragmites australis*, the bulrush *Typha capensis* and *Schoenoplectus brachyceras* are also present in certain areas.

Common forbs recorded in this habitat unit include *Berkheya pinnatifida subsp. ingrata, Berkheya radula, Berkheya setifera, Centella asiatica, Conium chaerophylloides, Helichrysum aureonitens, Helichrysum nudifolium var. pilosellum, Lobelia flaccida, Monopsis decipiens, Nidorella podocephala* and *Scabiosa columbaria.*

Alien woody taxa recorded in this habitat unit include *Eucalyptus sp., Quercus ruber, Populus x canescens, Pyracantha angustifolia and Salix babylonica.*

Sensitivity Aspects

Areas of Moist Grassland habitat are crucial in maintaining the hydrological functioning, ecological processes, and terrestrial biodiversity of the landscape. Several protected flora species were recorded in this habitat unit, and it is likely that several additional flora SCC are present. These habitats constitute vital landscape-scale movement and dispersal corridors, and in conjunction with adjacent dry grasslands, are important in maintaining local fauna population, including that of several SCC.

Figure 5-25 - Area of typical Moist Grassland in the study area.

Old Lands

As the name suggests, this habitat unit characterises former cultivated fields that have regenerated to a secondary grassland state via natural plant succession.

Vegetation structure is low closed grassland (sensu. Edwards, 1983). Compositionally, Old Lands are floristically depauperate. Dominant grass species recorded *include Hyparrhenia dregeana, Hyparrhenia hirta, Eragrostis chloromelas, Eragrostis curvula and Eragrostis plana* (seeFigure 5-26).

Forbs recorded in these areas typically include a mixture or indigenous and alien ruderal and weedy species such as *Bidens pilosa, Conyza bonariensis, Pseudognaphalium luteo-album, Senecio consanguineus, Rumex acetosella, Selago densiflora, Tagetes minuta, Verbena rigida* and *Wahlenbergia undulata.* The only woody species recorded in this habitat unit was *Seriphium plumosum*.

Sensitivity Aspects

Despite being previously disturbed, old lands can retain some of the functional attributes of natural grassland. This notwithstanding, no flora and fauna species of conservation were recorded in this habitat unit, and it is considered unlikely that any species will be present.

Figure 5-26 - Old Lands

Cultivated Fields

Large portions of the study area are characterised by Cultivated Fields, which is considered a modified habitat type. This habitat unit includes pivot-irrigated and dry-land crop fields – which are typically under maize production (Figure 5-27), as well as fields that are actively managed as grass pastures. Unlike areas of natural grassland, grass pastures are often fertilised and regularly mown and baled to provide reserve forage for livestock during the dry season.

Sensitivity Aspects

Cultivated Fields are typically denuded of indigenous vegetation and/or are subject to regular anthropogenic disturbances. When not dominated by a monoculture of crop species, these areas are typically colonised by alien weed species. No flora SCC were recorded in this habitat unit and

none are considered likely to be present due to the high level of disturbance. Although certain fauna species may move through and/or occasionally forage in these areas, considering the degree of ongoing disturbance and modification, they are not considered important fauna habitat.

Figure 5-27 - Cultivated Field.

Alien Tree Plantations

This habitat unit occurs in localised stands in the study area. Stands range from narrow windrows and more-defined plantations to informal thickets. Structurally and compositionally, alien tree plantations are incongruous with the natural habitat units in the study area.

Vegetation structure is defined as short- to tall, closed woodland characterised by closely-spaced aggregations of alien trees. Dominant alien tree species include alien *Eucalyptus, Acacia* (wattle) and *Populus* (e.g., *Populus x canescens*) species **Error! Reference source not found.**. Little indigenous vegetation is present in dense, well-established alien tree stands, with herbaceous flora typically supressed or in most cases, largely absent.

Sensitivity Aspects

Alien Tree Plantations is a modified habitat type, that is characterised by an almost complete dominance of essentially one or two non-indigenous tree species. No flora SCC were observed in these areas, and the probability of such taxa being present is low. From a fauna perspective, Alien Tree Plantations may be used as refuge habitats by fauna that are sensitive to hunting and other forms of anthropogenic disturbance. They can also form important roosting/nesting habitat for raptors.

Figure 5-28 - Alien Tree Plantation.

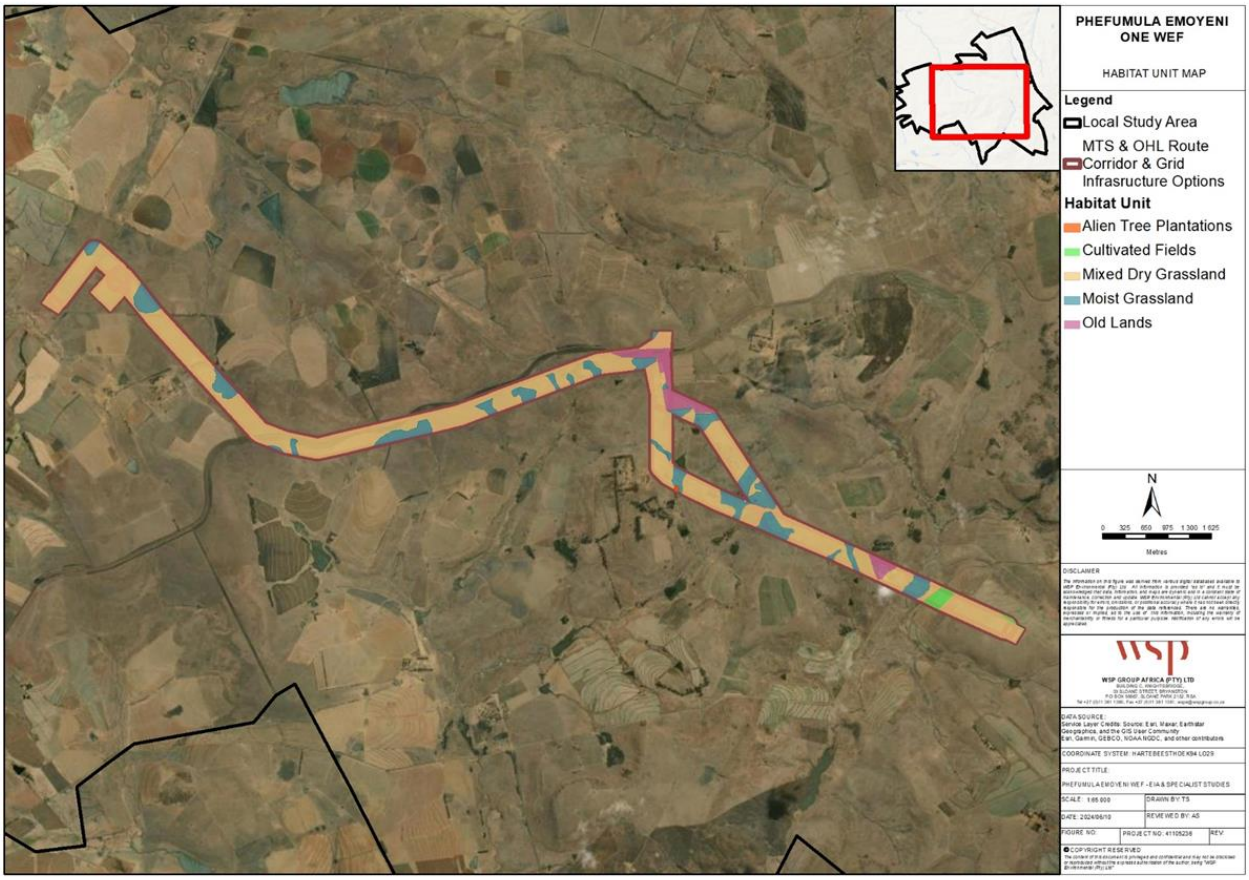


Figure 5-29 - Habitat unit map for the grid connection assessment corridor/footprints.

5.2.6 AVIFAUNA

The Project Site is located within the Amersfoort-Bethal-Carolina IBA (SA018) and 18km west of the Chrissie Pans IBA (SA019) (**Figure 5-30**).

According to Barnes (1998), the Amersfoort-Bethal-Carolina IBA holds a large proportion (>10%) of the global population of Botha's Lark *Spizocorys fringillaris*, although confirmation is required as to whether this is still the case. This lark generally avoids rocky areas, tall grass in bottomlands, vleis, croplands and planted pastures, but its preferred habitat – short, dense, natural grassland found on plateaus and upper hill slopes – occurs within this IBA. Data regarding the IBA's current species composition is limited, but the grassland areas occasionally hold Denham's Bustard, White-bellied Bustard, Blue Korhaan, African Grass Owl, Buff-streaked Chat, Southern Bald Ibis, Black-winged Pratincole, and Secretarybird.

The key species within this IBA is the globally threatened Botha's Lark. Other globally threatened species are Blue Crane, Southern Bald Ibis, Black Harrier, Blue Korhaan, Black-winged Pratincole, Secretarybird, Martial Eagle, and Denham's Bustard. Regionally threatened species are African Grass Owl, White-bellied Bustard, and Lanner Falcon.

As per communication from BirdLife South Africa (July 2024) it should be noted that IBAs are being replaced by Key Biodiversity Areas (KBAs).

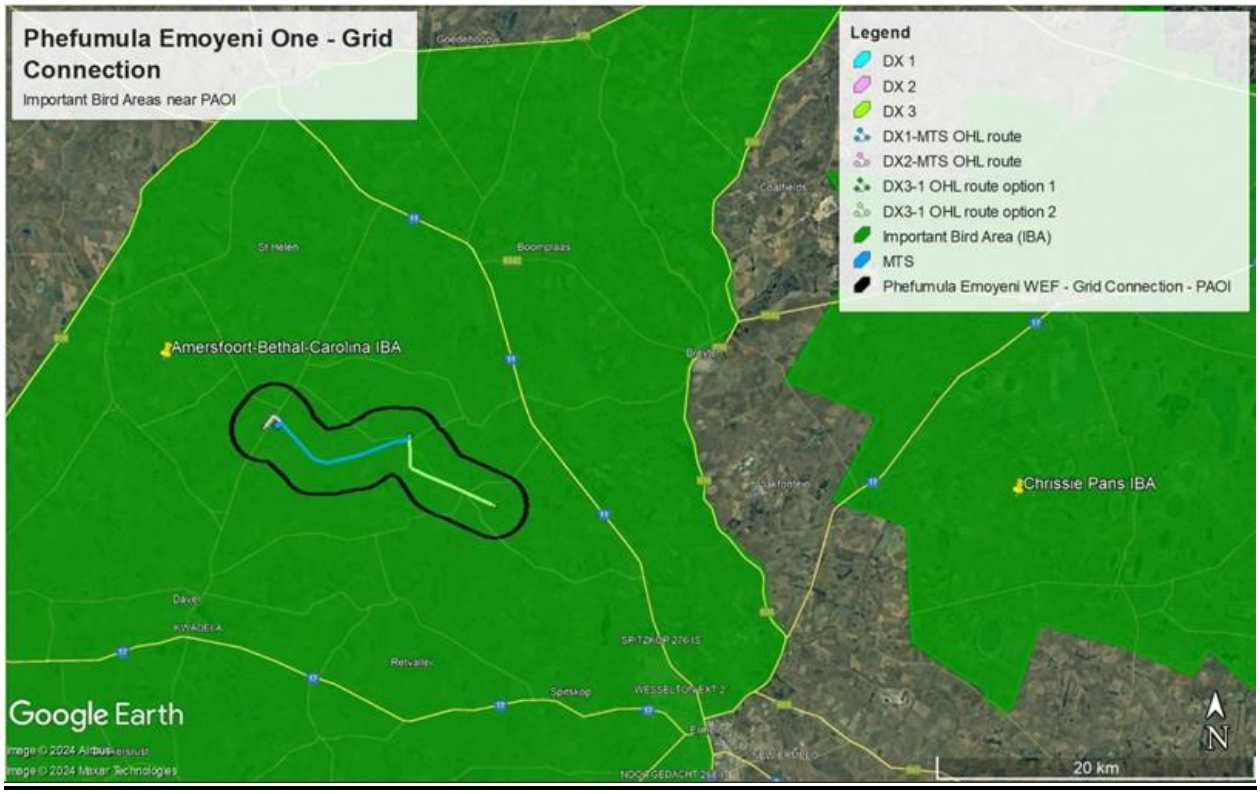


Figure 5-30 - Important Bird Areas near the Project Site.

Key Biodiversity Areas (KBAs) are 'sites that contribute significantly to the global persistence of biodiversity', which means they are the most important places in the world for species and their habitats – whether these be in terrestrial, freshwater, estuarine or marine ecosystem.

The Global Standard for the Identification of Key Biodiversity Areas, published in 2016, sets out internationally agreed scientific criteria for the identification of KBAs worldwide. Sites qualify as global KBAs if they meet the specific standardised criteria and quantitative thresholds focused on one or more of five trigger aspects:

1. Threatened biodiversity
2. Geographically restricted biodiversity
3. Ecological integrity
4. Biological processes
5. Irreplaceability through quantitative analysis

The Project Site only marginally overlaps with a KBA, namely the Chrissie Pans KBA (KBA ID 47) (**Figure 5-31**).

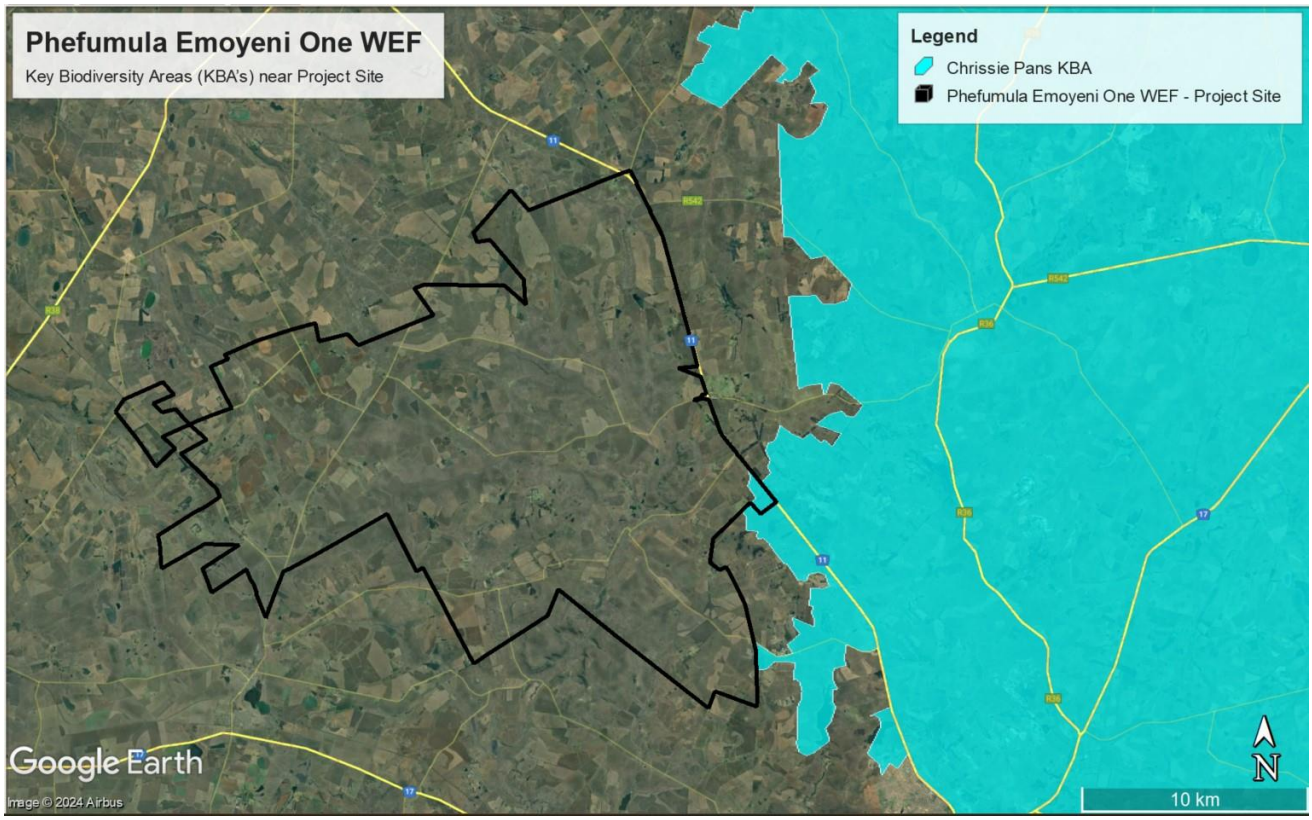


Figure 5-31 - Key Biodiversity Areas near the Project Site

5.2.6.1 Potential Avifauna Species on Site

A total of 224 bird species could potentially occur within the Broader Area where the Project Site is located. Of these, 80 are classified as priority species for electrical grid infrastructure (EGI) developments (i.e. EGI sensitive avifauna). Of the 80 EGI sensitive avifauna, 71 have a medium to high likelihood of occurring regularly in the Project Area of Influence (PAOI). Of the 80 EGI sensitive avifauna, 67 (84%) were recorded during the on-site field surveys. Eighteen (18) EGI sensitive avifauna recorded in the Broader Area are also Species of Conservation Concern (SCC). Twelve (12) SCC were recorded during the on-site field surveys namely, African Marsh Harrier (Regionally Endangered), Black Harrier (Globally and Regionally Endangered), Black Stork (Regionally Vulnerable), Black-winged Pratincole (Globally and Regionally Near-Threatened), Blue Crane (Globally Vulnerable and Regionally Near-Threatened), Cape Vulture (Globally Vulnerable and Regionally Endangered), Denham's Bustard (Globally Near-Threatened and Regionally Vulnerable), Lanner Falcon (Regionally Vulnerable), Martial Eagle (Globally and Regionally Endangered), Pallid Harrier (Globally and Regionally Near-Threatened), Secretarybird (Globally Endangered and Regionally Vulnerable) and Southern Bald Ibis (Globally and Regionally Vulnerable). The likelihood of EGI sensitive avifauna occurring in the Project Site, habitat classes, and potential long-term impacts of the proposed project are listed in **Table 5.2** below.

Table 5-2 - EGI sensitive species which could occur in the PAOI, habitat classes within the PAOI, and the potential impacts of the EGI Project on avifauna

Global and Regional (South African) Red List status: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; NT = Near Threatened; LC = Least Concern

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Abdim's Stork	*Ciconia abdimii*	0,82	0,00	-	NT		L	x		x	x	x						x
African Black Duck	*Anas sparsa*	9,02	0,00	-	-	x	M			x	x							x
African Darter	*Anhinga rufa*	31,15	4,96	-	-	x	H			x	x							x
African Fish Eagle	*Haliaeetus vocifer*	10,66	0,83	-	-	x	M		x	x	x		x		x	x		
African Harrier-Hawk	*Polyboroides typus*	8,20	0,00	-	-	x	M		x		x		x		x	x		
African Marsh Harrier	*Circus ranivorus*	0,00	0,00	-	EN	x	M	x		x	x	x			x	x		

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
African Sacred Ibis	*Threskiornis aethiopicus*	58,20	13,22	-	-	x	H	x		x	x					x		x
African Spoonbill	*Platalea alba*	26,23	4,13	-	-	x	H			x	x							x
African Swamphen	*Porphyrio madagascariensis*	3,28	0,00	-	-		L			x	x							
Amur Falcon	*Falco amurensis*	13,93	4,96	-	-	x	M	x	x		x	x	x			x		
Black Harrier	*Circus maurus*	0,82	0,00	EN	EN	x	M	x		x	x	x			x	x		
Black Sparrowhawk	*Accipiter melanoleucus*	17,21	1,65	-	-	x	H		x		x		x		x	x		
Black Stork	*Ciconia nigra*	0,82	0,00	-	VU	x	M			x	x				x	x		x
Black-chested Snake Eagle	*Circaetus pectoralis*	3,28	1,65	-	-	x	M	x	x		x	x	x		x	x		

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Black-crowned Night Heron	*Nycticorax nycticorax*	2,46	0,00	-	-	x	M			x	x							x
Black-headed Heron	*Ardea melanocephala*	75,41	18,18	-	-	x	H	x		x	x	x				x		x
Black-necked Grebe	*Podiceps nigricollis*	4,10	0,00	-	-	x	M			x	x							x
Black-winged Kite	*Elanus caeruleus*	85,25	28,93	-	-	x	H	x	x		x	x	x		x	x		
Blue Crane	*Grus paradisea*	3,28	0,00	VU	NT	x	M	x		x	x	x		x	x			x
Blue Korhaan	*Eupodotis caerulescens*	30,33	3,31	NT	LC	x	H	x				x		x	x			x
Blue-billed Teal	*Spatula hottentota*	0,82	0,00	-	-		L			x	x							x

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Booted Eagle	*Hieraaetus pennatus*	0,00[1]	0,00	-	-	x	M		x		x		x		x	x		
Brown Snake Eagle	*Circaetus cinereus*	1,64	0,00	-	-	x	M		x		x		x		x	x		
Cape Crow	*Corvus capensis*	2,46	1,65	-	-	x	M	x	x			x	x			x		
Cape Shoveler	*Spatula smithii*	27,87	4,96	-	-	x	H			x	x							x
Cape Teal	*Anas capensis*	4,10	0,83	-	-		M			x	x							x
Cape Vulture	*Gyps coprotheres*	0,00[2]	0,00	VU	EN	x	M	x			x		x		x	x	x	x

[1] Booted Eagles were recorded during the on-site surveys (pre-construction monitoring), not during a SABAP2 survey, hence a reporting rate of 0%.
[2]Cape Vultures were recorded during the on-site surveys (pre-construction monitoring), not during a SABAP2 survey, hence a reporting rate of 0%.

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Common Buzzard	*Buteo buteo*	27,05	8,26	-	-	x	H	x	x		x	x	x			x		
Common Moorhen	*Gallinula chloropus*	18,03	4,96	-	-	x	H			x	x							
Denham's Bustard	*Neotis denhami*	0,00	0,00	NT	VU	x	M	x				x		x	x			x
Egyptian Goose	*Alopochen aegyptiaca*	87,70	18,18	-	-	x	H	x	x	x	x	x	x			x		x
Glossy Ibis	*Plegadis falcinellus*	31,97	4,13	-	-	x	H			x	x							x
Goliath Heron	*Ardea goliath*	4,10	0,83	-	-	x	M			x	x							x
Great Crested Grebe	*Podiceps cristatus*	9,02	0,00	-	-	x	M			x	x							x
Great Egret	*Ardea alba*	13,93	1,65	-	-		H			x	x							x
Greater Flamingo	*Phoenicopterus roseus*	13,93	11,57	-	NT		M			x	x							x
Greater Kestrel	*Falco rupicoloides*	4,92	0,00	-	-	x	M	x	x		x		x		x	x		

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Grey Heron	*Ardea cinerea*	45,08	6,61	-	-	x	H			x	x							x
Hadada Ibis	*Bostrychia hagedash*	89,34	14,05	-	-	x	H	x		x	x	x				x		x
Hamerkop	*Scopus umbretta*	12,30	2,48	-	-	x	M			x	x					x		x
Helmeted Guineafowl	*Numida meleagris*	66,39	12,40	-	-	x	H	x	x		x	x				x		
Intermediate Egret	*Ardea intermedia*	35,25	4,96	-	-	x	H			x	x							x
Jackal Buzzard	*Buteo rufofuscus*	15,57	0,00	-	-	x	H	x	x		x	x	x		x	x		
Lanner Falcon	*Falco biarmicus*	9,02	1,65	-	VU	x	M		x		x	x	x		x	x		
Lesser Flamingo	*Phoeniconaias minor*	6,56	2,48	NT	NT		M			x	x							x
Little Egret	*Egretta garzetta*	18,85	0,83	-	-	x	H			x	x							x
Little Grebe	*Tachybaptus ruficollis*	57,38	8,26	-	-	x	H			x	x							x

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Long-crested Eagle	*Lophaetus occipitalis*	0,00	0,83	-	-	x	M		x		x	x	x		x	x		
Maccoa Duck	*Oxyura maccoa*	4,10	0,00	EN	NT	x	M			x	x							x
Marsh Owl	*Asio capensis*	19,67	0,83	-	-	x	H	x		x		x		x	x	x		x
Martial Eagle	*Polemaetus bellicosus*	6,56	0,00	EN	EN	x	M	x	x		x		x		x	x		
Northern Black Korhaan	*Afrotis afraoides*	0,00	0,00	-	-	x	M	x						x	x			x
Pallid Harrier	*Circus macrourus*	0,00	0,00	NT	NT	x	M	x	x		x	x				x		
Peregrine Falcon	*Falco peregrinus*	0,00	0,00	-	-	x	M	x	x		x		x		x	x		
Pied Crow	*Corvus albus*	13,11	2,48	-	-	x	H	x				x	x			x		
Purple Heron	*Ardea purpurea*	2,46	1,65	-	-	x	M			x	x							x

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Red-billed Teal	*Anas erythrorhyncha*	42,62	4,13	-	-	x	H			x	x							x
Red-knobbed Coot	*Fulica cristata*	78,69	14,88	-	-	x	H			x	x							x
Reed Cormorant	*Microcarbo africanus*	71,31	9,09	-	-	x	H			x	x							x
Rock Kestrel	*Falco rupicolus*	15,57	2,48	-	-	x	H	x			x		x			x		
Rufous-breasted Sparrowhawk	*Accipiter rufiventris*	0,00	0,00	-	-	x	M		x		x		x		x	x		
Saddle-billed Stork	*Ephippiorhynchus senegalensis*	0,82	0,00	-	EN		L			x	x				x			x
Secretarybird	*Sagittarius serpentarius*	17,21	3,31	EN	VU	x	H	x			x	x		x	x			x
South African Shelduck	*Tadorna cana*	38,52	7,44	-	-	x	H			x	x							x
Southern Bald Ibis	*Geronticus calvus*	25,41	4,96	VU	VU	x	H	x			x	x	x		x	x		x

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
Southern Pochard	*Netta erythrophthalma*	13,93	0,83	-	-	x	H			x	x							x
Spotted Eagle-Owl	*Bubo africanus*	5,74	0,00	-	-	x	M	x	x			x			x	x		x
Spur-winged Goose	*Plectropterus gambensis*	42,62	7,44	-	-	x	H	x		x	x	x						x
Striated Heron	*Butorides striata*	1,64	0,00	-	-	x	L			x	x							x
Wahlberg's Eagle	*Hieraaetus wahlbergi*	0,00	0,00	-	-	x	M		x		x		x		x	x		
Western Barn Owl	*Tyto alba*	2,46	0,00	-	-		L	x	x			x				x		x
Western Cattle Egret	*Bubulcus ibis*	60,66	17,36	-	-	x	H	x		x	x	x				x		x
White Stork	*Ciconia ciconia*	4,92	2,48	-	-	x	M	x		x	x	x						x
White-backed Duck	*Thalassornis leuconotus*	6,56	0,83	-	-	x	M			x	x							x
White-bellied Bustard	*Eupodotis senegalensis*	2,46	0,00	-	VU		L	x				x		x	x			x

Species Name	*Scientific Name*	SABAP2 Reporting Rate %		Global Conservation Status	Regional Conservation Status	Recorded During Monitoring	Likelihood of Regular	Grassland	Woodland & Alien Trees	Drainage Lines & Wetlands	Dams	Agriculture	High Voltage Power Lines	Displacement - Habitat Loss	Displacement - Disturbance	Substation - Electrocution	Powerline - Electrocution HV	Powerline - Collision
		Full Protocol	Ad Hoc Protocol															
White-breasted Cormorant	*Phalacrocorax lucidus*	36,07	2,48	-	-	x	H			x	x							x
White-faced Whistling Duck	*Dendrocygna viduata*	4,10	0,00	-	-		M			x	x							x
Yellow-billed Duck	*Anas undulata*	69,67	11,57	-	-	x	H			x	x							x
Yellow-billed Kite	*Milvus aegyptius*	0,82	0,83	-	-		L	x	x		x	x	x			x		
Yellow-billed Stork	*Mycteria ibis*	2,46	0,83	-	EN		L			x	x							x

5.3 SOCIAL ENVIRONMENT

5.3.1 LAND USE

The land cover of the site and surrounding area is shown on **Figure 5-32**. Large parts of the overall project site are essentially undeveloped or used for extensive agricultural practices, with farmsteads, smallholdings, numerous dams, and several gravel roads being the most prominent infrastructure. The site is also bounded by the N11 highway to the east, and several high-mast power lines (**Figure 5-33**) and radio towers (**Figure 5-34**) also occur within the site, although the latter are not prominent in medium-range views. Other large roads in the study area include the N17 highway to the south and R38 west and north of the site.

Existing impacts and key drivers of change that were observed in the study area during the field survey, and that are likely to influence ecosystem dynamics and functioning and the distribution of fauna and flora species in the study area are discussed below. Map showing the major land cover types as per exiting spatial data, are presented in **Figure 5-32**.

Farming is the dominant land use within the study area, and well as across the surrounding landscape. Irrigated and dry-land cultivation, coupled with livestock production (mostly cattle, but also sheep) are the primary farming activities and these, over the long term, have caused varying degrees of spatial habitat modification and disturbance.

Mining operations are present to the south-east and north of the study area. Mined areas are either completely transformed with typically no natural habitat remaining or comprise habitat that is highly disturbed.

Various forms of linear infrastructure are present in the study area and broader landscape, including major national roads (N11 and N17), several gravel district roads, farms roads and informal vehicle tracks, a defunct railway line, and numerous farm fences. To varying degrees, and in conjunction with transformative land uses activities, linear infrastructure has caused habitat fragmentation across the study area, although it is noted the large intact habitat patches remain present.

Alien invasive species are present in the study area. Many localised alien tree stands are present, and typically comprise *Acacia mearnsii, Acacia dealbata, Eucalyptus camaldulensis* and *Populus x canescens.* It was also noted that the edges of many cultivated fields as well as other disturbed sites are encroached by various herbaceous AIS (e.g., *Verbena bonariensis*).

Other anthropogenic activities and infrastructure in the study area that have resulted in habitat loss and disturbance include inter alia, farm residences and various agriculture structures (barns).

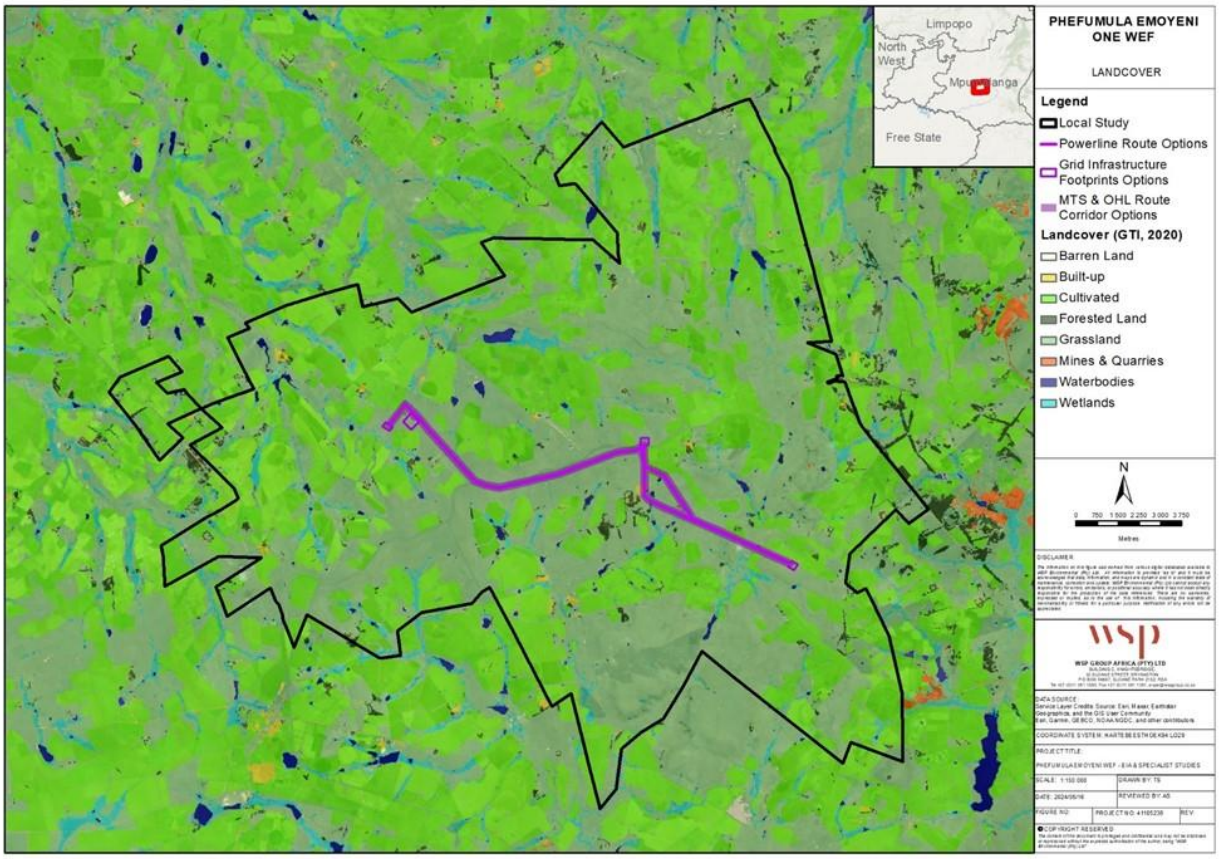


Figure 5-32 - Landcover associated with the study area and surrounding landscape.

Figure 5-33 - High-mast power lines traverse parts of the project site

Figure 5-34 - Several tall telecommunication towers are also located within the site, although these are not prominent in medium-range views – pictured here is the project meteorological measurement mast

According to GeoTerra Land Cover Imagery (2020) of the study area indicates that large patches of the study area comprise cultivated land. Livestock farming with cattle, sheep/goats is likely to be a common land use in the study area. The study area is also traversed by numerous formal and inform farm roads and tracks which is possibly used by neighbouring farmers for access.

5.3.2 HERITAGE AND CULTURAL RESOURCES

The study area is rural in character and sparsely developed. Infrastructure includes fences, windpumps, and access roads all associated with the farming activities in the study area. The Project area is undulating and used for cultivation and grazing.

The archaeological record for the greater study area consists of the Stone Age, Iron Age and Historical Period.

5.3.2.1 Stone Age

The Stone Age of southern Africa starts when hominins (ancestral to modern-day humans) first started to produce crude tools made with stone. The Earlier Stone Age (ESA 2 million - 200 000 years ago) is associated with hominins such as *Homo habilis* and *Homo erectus* (Dusseldorp et al. 2013). Mpumalanga currently does not have an extensive ESA archaeological record, at Maleoskop on the farm Rietkloof, only a few ESA artefacts have been found and stone tools consisted of choppers (Oldowan), hand axes, and cleavers (Acheulean) (Esterhuysen & Smith 2007) and some surface scatters have been recorded near Piet Retief (Nel & Karodia 2013).

Middle Stone Age (MSA) artefacts represents archaic and modern humans that occupied the landscape between 300 000 to 40 000 before present. Later Stone Age (LSA) occupational sequences reflect San and Khoisan communities from 40 000 years ago until recently (Dusseldorp et al. 2013). Although the MSA and LSA has not been extensively studied in Mpumalanga, evidence for these periods has been excavated from Bushman Rock Shelter in the Ohrigstad District (Esterhuysen & Smith 2007; Lombard et al. 2012) and it is known that San communities lived near Lake Chrissie as recently as the 1950s (e.g., Schlebusch et al. 2016). MSA and LSA surface scatters have also been investigated in the vicinity of Piet Retief, and De Wittekrans nearby Camden is a Later Stone Age archaeological rock art site complex (Nel & Karodia 2013).

5.3.2.2 Iron Age

The archaeology of farming communities of southern Africa encompasses three phases. The Early Iron Age (200-900 CE) represents the arrival of Bantu-speaking farmers in southern Africa. Living in sedentary settlements often located next to rivers, these farmers cultivated sorghum, beans, cowpeas, and kept livestock. The Middle Iron Age (900-1300 CE) is mostly confined to the Limpopo Valley in southern Africa with Mapungubwe Hill probably representing the earliest 'state' in this region (Huffman 2007).

The Late Iron Age (LSA - 1300-1840s CE) marks the arrival and spread of ancestral Eastern Bantu-speaking Nguni and Sotho-Tswana communities into southern Africa. The location of Late Iron Age settlements is usually on or near hilltops for defensive purposes. The Late Iron Age as an archaeological period ended by 1840 CE, when the Mfecane caused major socio-political disruptions in southern Africa (Huffman 2007). Close to Ermelo, on Tafelkop Mountain, is the well-known LIA Tafelkop Settlement. It consists of various settlement complexes with over 100 corbelled huts in numerous clusters on the mountain top (Esterhuysen & Smith 2007). The site was declared a Provincial Heritage Site.

Dates from Early Iron Age sites indicated that by the beginning of the 5th century CE Bantu-speaking farmers had settled in the Mpumalanga lowveld. Subsequently, farmers continued to move into and between the lowveld and highveld of Mpumalanga. Iron Age sites such as Welgelegen Shelter, Robertsdrift situated 50-100 km west of Camden dates from the 12th to the 18th century (Derricourt & Evers 1973; Esterhuysen & Smith 2007).

During the mid-17th century Europeans started to settle in modern-day Cape Town. During and after the conflict caused by the Mfecane (1820-1840), during the reign of king kaSenzangakhona Zulu, known as Shaka, Dutch-speaking farmers started to migrate to the interior regions of South Africa. A period that is marked by various skirmishes and battles between the local inhabitants, Dutch settlers and the British (Giliomee & Mbenga 2007).

5.3.2.3 Historical context of Camden

Camden power station was commissioned in 1967 (Gaigher 2011; Matenga 2020). However, the nearby town of Ermelo has a rich history. The earliest record for settlers in Ermelo is from 1860, when the area was under the jurisdiction of Zulu-speaking Nhlapo communities (Nhlapo 1945). The construction of the town of Ermelo was initiated by the Dutch Reform Church, which purchased the eastern part of the farm Nooitgedacht on 26 May 1879. The town was officially proclaimed on 12 February 1880 by William Owen Lanyon, the Administrator of the Transvaal (Greyling 2017).

5.3.2.4 Battlefields and war history

Due to the proximity of Ermelo to the Nederlandsche Zuid-Afrikaansche Spoorweg-Maatskappij railway line linking Pretoria with Lourenço Marques (Maputo), the area was subject to various skirmishes during the Anglo-Boer War of 1899-1902. At the time there were about 100 families residing in the town and many women and children were sent to British concentration camps. In 1901, British troops burnt the town down due to their scorched earth policy, and Ermelo was rebuilt in 1903 (Moody 1977; Pretorius 2000; Van Schalkwyk 2012; Greyling 2017).

5.3.2.5 Graves and Burial sites

Numerous burial sites are indicated by the Genealogical Society of the South Africa (GSSA) for the study area (**Figure 5.35**). The known cemeteries are summarised in **Table 5-3** below.

Table 5-3 - Cemeteries identified in the area

Cemetery	Location	Number of Graves
Nooitgedacht 237	26°21'17.64"S; 29°48'26.16"E	1

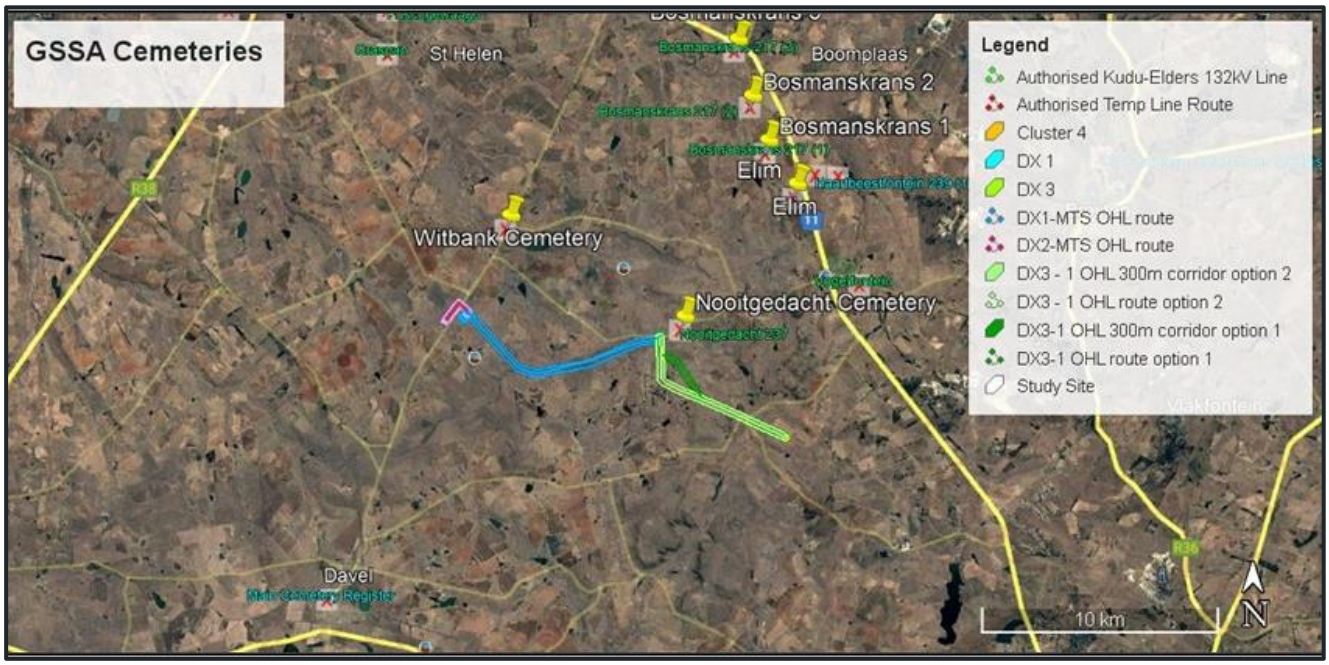


Figure 5.35. Cemeteries identified in the study area.

5.3.2.6 Cultural Landscape

The surrounding and most of the impact area are cultivated, and forms part of a landscape characterised by wide scale cultivation and mining activities. Development in the study area is limited to farming infrastructure such as access roads, fences, and agricultural developments. The clusters of trees around farmsteads are generally planted to protect the houses from wind and they form part of the cultural landscape.

PROBABILITY OF OCCURRENCE OF SITES

Based on the above information, it is possible to determine the probability of finding archaeological and cultural heritage sites within the study area to a certain degree. Low indicates that no known occurrences of sites have been found previously in the general study area. Medium probability indicates some known occurrences in the general study area are documented and can therefore be expected in the study are. High probability indicates that occurrences have been documented close

to or in the study area and that the environment of the study area has a high degree of probability having sites.

Palaeontological landscape

- Fossil remains. Medium probability.

Archaeological And Cultural Heritage Landscape

- NOTE: Archaeology is the study of human material and remains (by definition) and is not restricted in any formal way as being below the ground surface.
- Archaeological remains dating to the following periods can be expected within the study area:
- **Stone Age finds.**
  - ESA: Low Probability
  - MSA: Low Probability
  - LSA: Low to Medium Probability
  - LSA –Herder: Low Probability
  - Rock Art Sites – Medium to high Probability
- **Iron Age finds.**
  - EIA: Low Probability
  - MIA: Low Probability
  - LIA: High Probability
- **Historical finds:**
  - Historical period: High Probability
  - Historical dumps: Medium Probability
  - Structural remains: High Probability
  - Cultural Landscape: Medium probability

Living Heritage

- For example, rainmaking sites: Low Probability

Burial/Cemeteries

- Burials over 100 years: Medium Probability
- Burials older than 60 years: High Probability
- Subsurface excavations including ground levelling, landscaping, and foundation preparation can expose any number of these.

Based on the current information obtained for the area at a desktop level, it is anticipated that apart from the burial sites, any other heritage resources that occur within the development areas could have a Generally Protected B (GP. B) or lower field rating and should be mitigatable. Graves are of high social significance (Field rating GP A) and should preferably be preserved in situ.

The area has historically been occupied and although the cultural landscape attests to more recent occupation, heritage resources such as structures (including farmsteads/ruins and associated burial sites) and associated landscape elements older than 60 years are of importance and are protected

by Section 34 & 36 of the NHRA. Iron Age stone walled settlements also occur in the study area and is protected by Section 35 of the NHRA.

Figure 5-36 and **Table 5-4** respectively illustrate and outline the known heritage sites in the project area.

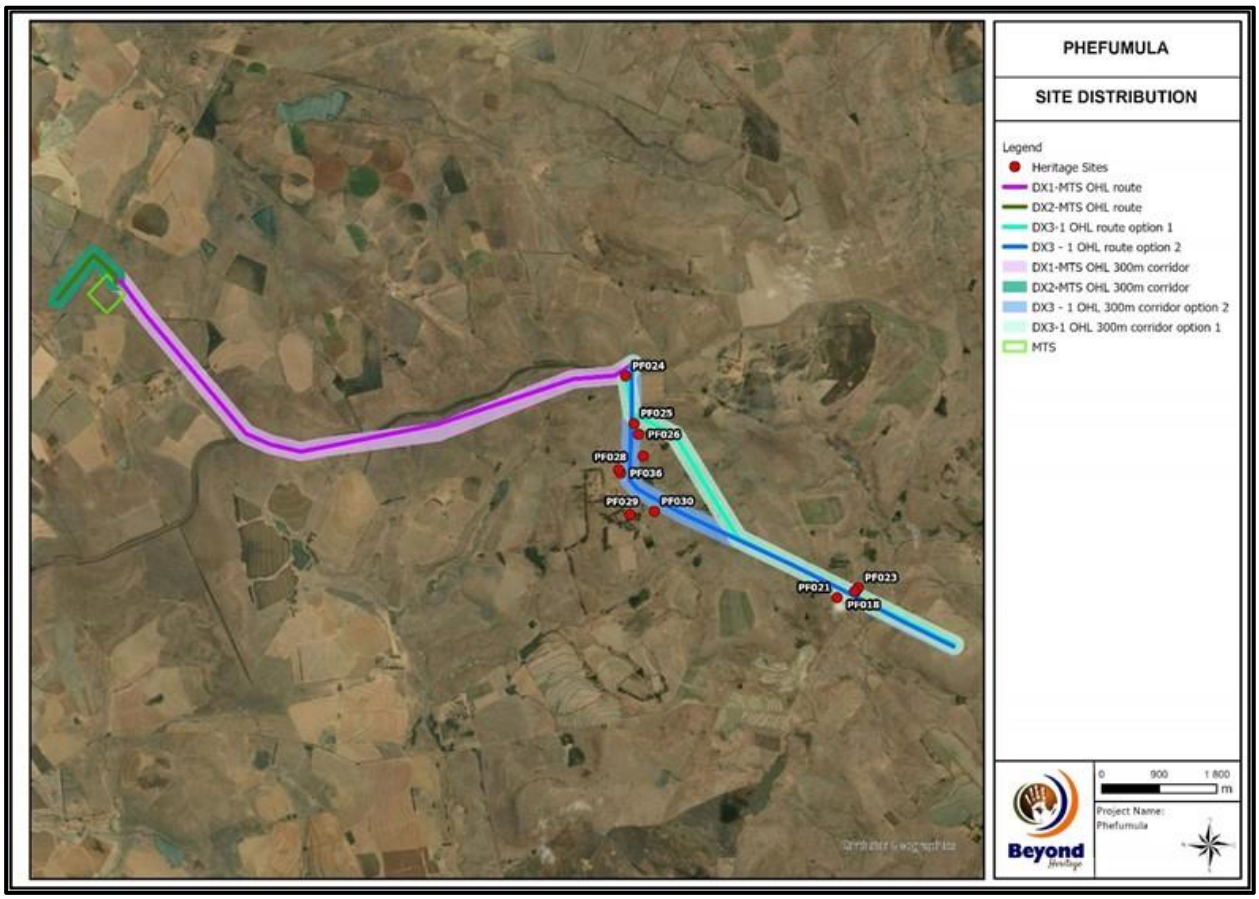


Figure 5-36 – Known Heritage sites in the project area

Table 5-4 - Known Heritage Sites in the project area

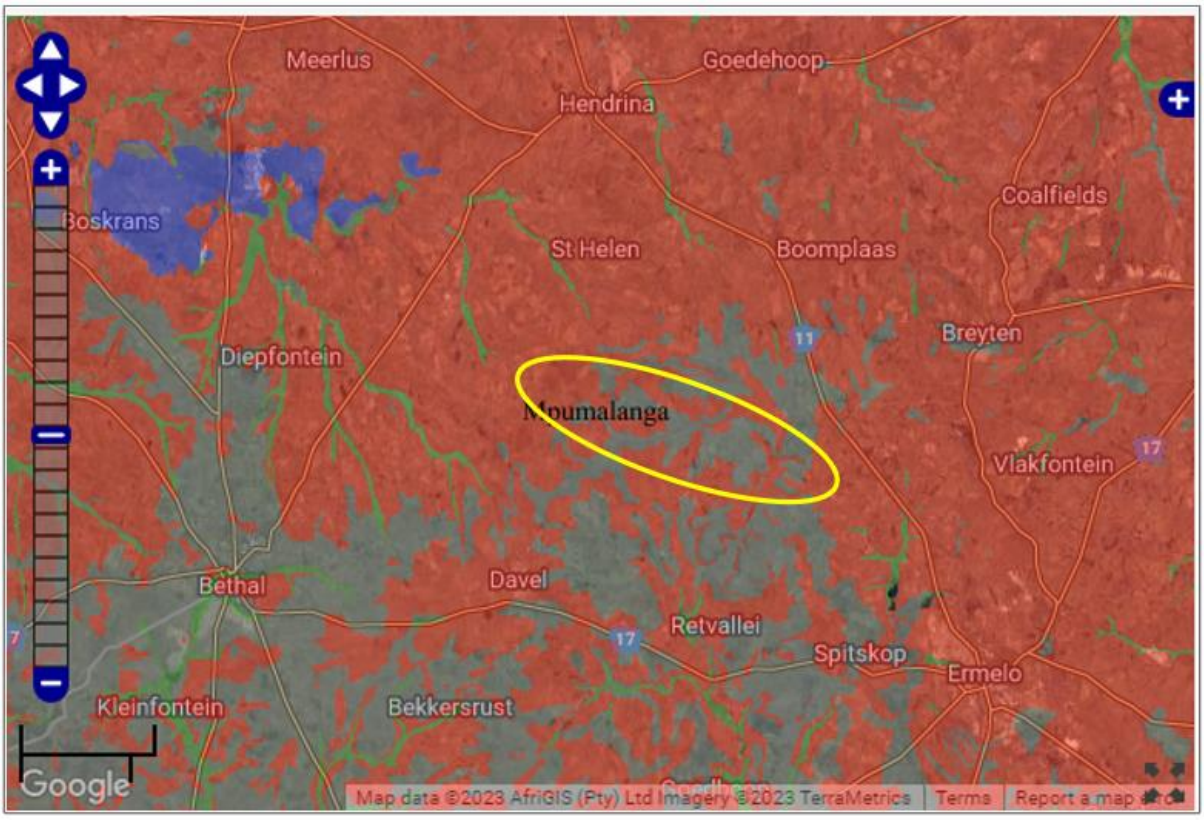
Label	Description	Sensitivity	Location
PF025	Ruins/Broken down structure	Low	29°47' 58.84448640" E 26°21' 54.98638200" S
PF026	Modern school structure/Abandoned	Low	29°48' 01.63807560" E 26°22' 00.50868120" S
PF036	Large broken down informal settlement/Building rubble	Low	29°47' 52.40034600" E 26°22' 20.52124680" S
PF030	Historical Packed stone kraal	Low	29°48' 12.49921080" E

Label	Description	Sensitivity	Location
			26°22' 39.16930440" S
PF018	Packed stone ruins/Circular packed stone walling	Low	29°50' 07.74964320" E 26°23' 15.76687560" S
PF021	Packed stone ruins/ Stone foundations	Low	29°49' 57.56532600" E 26°23' 19.21555680" S
PF023	Packed stone ruins /Circular packed stone walling and enclosures	Low	29°50' 09.32989920" E 26°23' 13.72554600" S
PF029	Historical farmstead	Med	29°47' 58.85494080" E 26°22' 41.35558440" S
PF024	Large Burial site 85+ Graves	High	29°47' 53.13118200" E 26°21' 31.13286120" S
PF028	Burial site 2 graves	High	29°47' 51.11881800" E 26°22' 18.92288640" S
PF017	Burial site	High	29°50' 07.40896800" E 26°23' 15.59276520" S

5.3.3 PALAEONTOLOGY

The study area is of insignificant and very high palaeontological sensitivity (**Figure 5.37**) and further studies will be required in the EIA phase. Previous assessments by Bamford (2022 and 2023) concluded that based on the fossil record and confirmed by site visits, there were NO FOSSILS of the Glossopteris flora even though fossils have been recorded from rocks of a similar age and type in South Africa. It is extremely unlikely that any fossils would be preserved in the overlying soils and sands of the Quaternary. There is a very small chance that fossils may occur below the ground surface in the shales of the Vryheid Formation (Ecca Group, Karoo Supergroup) so a Fossil Chance Find Protocol should be added to the EMPr.

An independent study will have to be conducted for this project in the EIA phase.



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

Figure 5.37. Palaeontological sensitivity map of the approximate study areas (yellow polygon).

5.3.4 VISUAL CHARACTER AND SENSITIVITY

The natural topography of the site and study area is representative of that of the region, and is largely devoid of distinctive landmarks, although larger rises and low ridges do provide some visual variation and create focal points in short range views. The site natural topography is also essentially untransformed, in comparison to areas directly to the west which have notably been transformed by surface coal mining. The site topographical visual resource value is therefore rated as high. Similarly, the hydrological aspect of the site is undistinctive and visually like that of much of the larger area, although large sections of wetland are still largely intact. The many dams of different sizes do create points of interest and attract birdlife which adds diversity and a dynamic aspect to the site, and the hydrological aspects of the site is therefore rated as being of high visual resource value.

Given the fact that only a fraction of the once expansive original Highveld grasslands remains, and the further threat posed by mining, agriculture, informal settlement, and associated degradation, the visual resource value of the remaining untransformed sections of the site's vegetation cover is rated as high. Similarly, individual clumps and lanes of planted pine and oak trees create points of interest and contribute to the rural character and charm of the area, and also have a high visual resource value. The visual resource value of the mostly agricultural land uses and associated land cover of the site (**Figure 5-38**), within the context of the larger study area, is considered high.

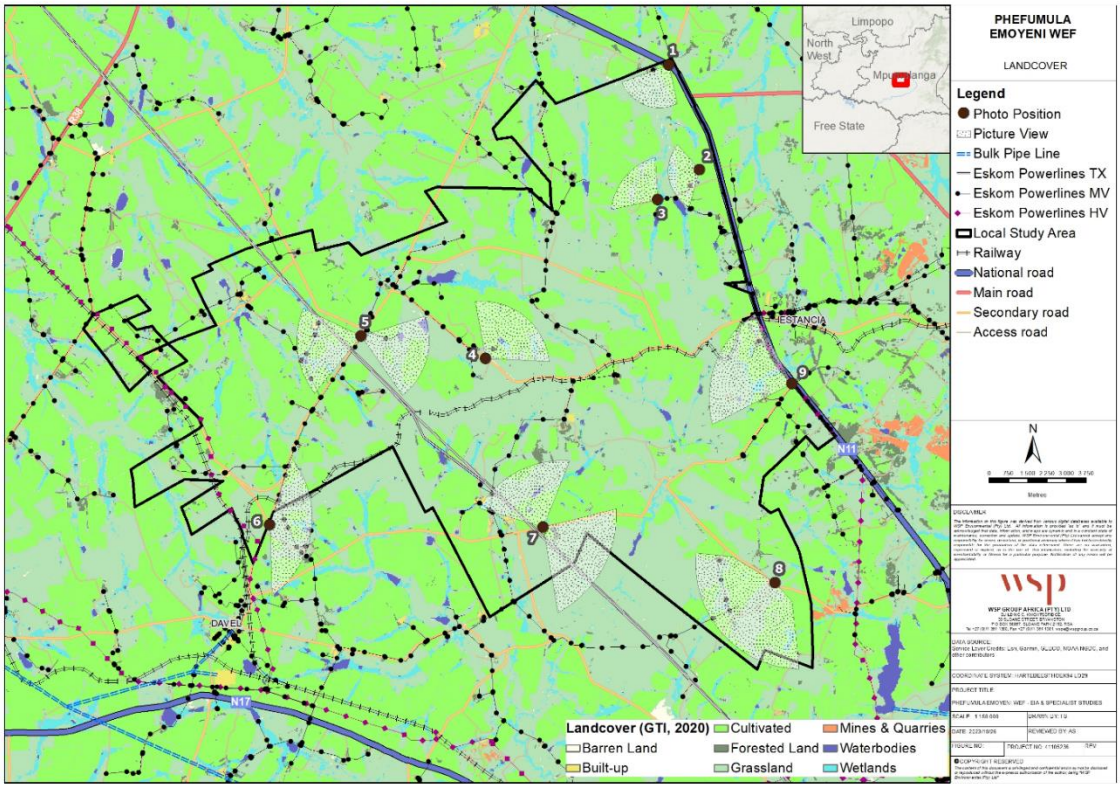


Figure 5-38 - Land cover map showing surface water and remaining natural vegetation areas which are deemed high visual resource value aspects of the site which are deemed high visual resource value aspects of the site.

5.3.4.1 Visual Receptor Groups

Visual impact is primarily concerned with human interest. Potential viewers, or visual receptors, thus constitute people that might see and be affected by the proposed development. Receptor sensitivity refers to the degree to which an activity is expected to impact receptors, and depends on the following:

- The various groups of people (visual receptor groups) that occur within the project study area.
- How many people will see and be impacted by the project.
- How frequently they are expected to be exposed to the project.
- Their perceptions regarding the aesthetics of the existing visual context.

Visual receptors of the proposed project can be broadly categorised into two main groups, namely:

- People who live or work in the area, and who will be continuously or frequently exposed to the Project components (resident receptors)
- People who travel through the area and are only temporarily exposed to the project components (passing receptors)
- Receptors in the study area potentially include the following groups:
- Residents of the various farmsteads and smallholdings on or within viewing distance of the site, and workers at these establishments (resident receptors).
- People working at the various mines that occur east of the site, and other agricultural and commercial establishments surrounding the site (resident receptors).
- Residents of and visitors to the towns and associated settlements potentially within sight of the site (resident and passing receptors).
- Other travellers along the various national and regional roads, and other asphalt and gravel roads surrounding the site (passing receptors).

The degree to which these receptors will be impacted by the project will be dependent on the level of visibility of the project components within the project study area, which will be further assessed during the impact assessment phase.

The following ratings have been applied to the identified visual receptor groups:

- **Resident receptors:** Resident receptors comprise at least a moderate to possibly large number of people (incidence factor) living and/or working in the study area. We advance that considering the low existing levels of development associated with the rural setting, a notable contingent of this receptor group will probably attach a high value (vulnerability factor) to the visual appearance of the project site.
- **Passing receptors:** People travelling through the study area will include residents, travelling workers, regional tourists, and people on route to towns in the area, or destinations elsewhere. Given the proximity of numerous towns and the fact that the site is bordered by the N11 it is likely that many people (incidence factor) see the site on a frequent basis. It can be assumed that different people within this receptor group will have widely divergent views on the value of the site and surroundings as a visual resource, which will largely be determined by their relation to the area. To account for this degree of variability, it is assumed that this group on a whole will on average attach at least a moderate degree of value to the proposed project site (vulnerability factor).

5.3.4.2 VISUAL ABSORPTION CAPACITY

Visual absorption capacity (VAC) can be defined as an “estimation of the capacity of the landscape to absorb development without creating a significant change in visual character or producing a reduction in scenic quality” (Oberholzer, 2008). The ability of a landscape to absorb development or additional human intervention is primarily determined by the nature and occurrence of vegetation cover, topographical character, and human structures.

A further major factor is the degree of visual contrast between the proposed new project and the existing elements in the landscape. If, for example, a visually prominent industrial development already exists in an area, the capacity of that section of landscape to visually “absorb” additional industrial structures is higher than that of a similar section of landscape that is still in its natural

state. VAC is therefore primarily a function of the existing land use and cover, in combination with the topographical ruggedness of the study area and immediate surroundings.

Based on the very limited degree of landscape transformation of the site within the study area, the gently rolling topography, and overall lack of distinctive features, vertical elements or landmarks, the VAC of the site is rated as low (**Figure 5-39**).

Figure 5-39 - The entire site is characterised by low degree of visual absorption capacity.

5.3.5 SOCIO-ECONOMIC

REGIONAL CONTEXT

The proposed project is in Mpumalanga Province, located in the Northeastern part of South Africa. Mpumalanga Province covers an area of 76 495km² and has a population of approximately 4 335 965. The capital city of Mpumalanga is Mbombela, and other major cities and towns include Emalahleni, Secunda, eMkhondo, Malelane, Middelburg, Barberton, and Ermelo which is the closest town to the proposed project.

The province is divided into three district municipalities: Ehlanzeni, Nkangala Districts, and Gert Sibande, in which the proposed project is located. These three districts are further subdivided into 17 Local Municipalities. The proposed development is situated in the Msukaligwa Local Municipality (MLM).

DISTRICT CONTEXT

Gert Sibande District Municipality is a Category C municipality in Mpumalanga Province. It is bordered by the Ehlanzeni and Nkangala District Municipalities to the north, KwaZulu-Natal and the Free State to the south, eSwatini to the east, and Gauteng to the west.

The district covers an area of 31 840km², making it the largest of the three districts in the province. It comprises seven local municipalities: Govan Mbeki, Chief Albert Luthuli, Dipaleseng, Mkhondo, Lekwa, Dr Pixley ka Isaka Seme and Msukaligwa. (Municipalities of South Africa, 2023).

LOCAL CONTEXT

Msukaligwa Local Municipality covers an area of 6 016 km². It is one of the seven local Municipalities within the Gert Sibande District Municipality. It has a population of 149,377 people. Msukaligwa LM is the 3rd most populated municipality in the District of Gert Sibande.

The Msukaligwa Municipality is bounded by Govan Mbeki Municipality, Chief Albert Luthuli Local Municipality, Mkhondo Local Municipality and Lekwa Local Municipality. It is accessible through three National Roads and Provincial main roads, which are N2, N11, and N17, R33, R39, R65 and R542. **Figure 5-40** below depicts the local context.

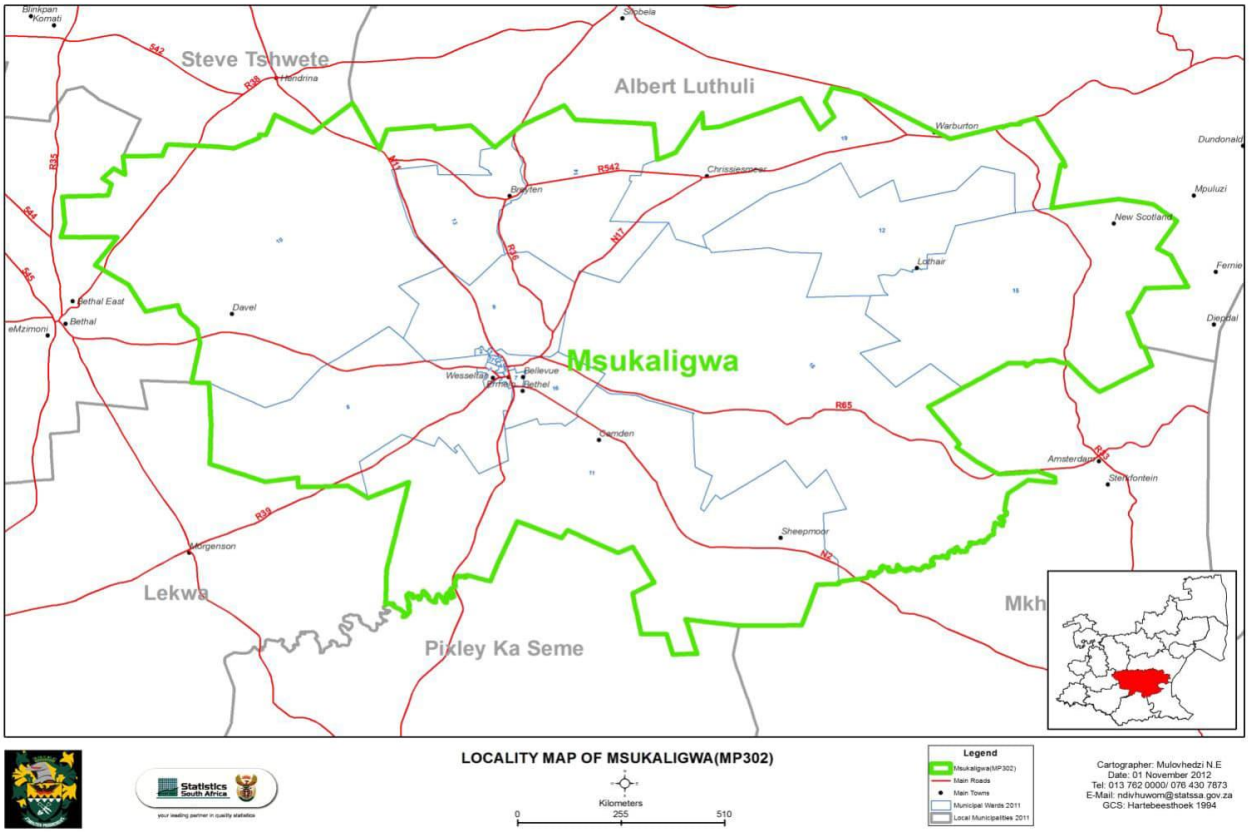


Figure 5-40 - Local Context Msukaligwa Municipality comprises 19 Wards, with wards 1-9 and 17 clustered within Ermelo town and Wesselton Township (Msukaligwa Municipality, 2022)**.**

DEMOGRAPHIC OVERVIEW

Trends in demography are fundamental driving forces for any development of an area in terms of housing, retail, engineering services, community and government services, safety, and security. The demographic profile influences the type of goods and services, their level of demand and the pressure on local services, infrastructure, and public transport.

POPULATION

According to Statistics South Africa Community Survey 2016, the municipality has a population of 164,608 persons with a population density of 27.3 persons per square kilometre.

According to Stats SA Mid-Year Population Estimates 2021, the estimated population number for 2022 is 190 532 people or 14.8% of the Gert Sibande District population and Stats SA projects that in 2030, the population will increase to 217 272 or 15.0% of the district. This increase will pressure infrastructure, service delivery and employment opportunities within the municipality.

The number of households in Msukaligwa increased from 40 932 to 51 089 between 2011 and 2016 (more than 10,000 households). According to Stats SA, the estimated number of households in 2022 is 63,050 and is projected to increase to 71,899 households by 2030 see **Figure 5-41.**

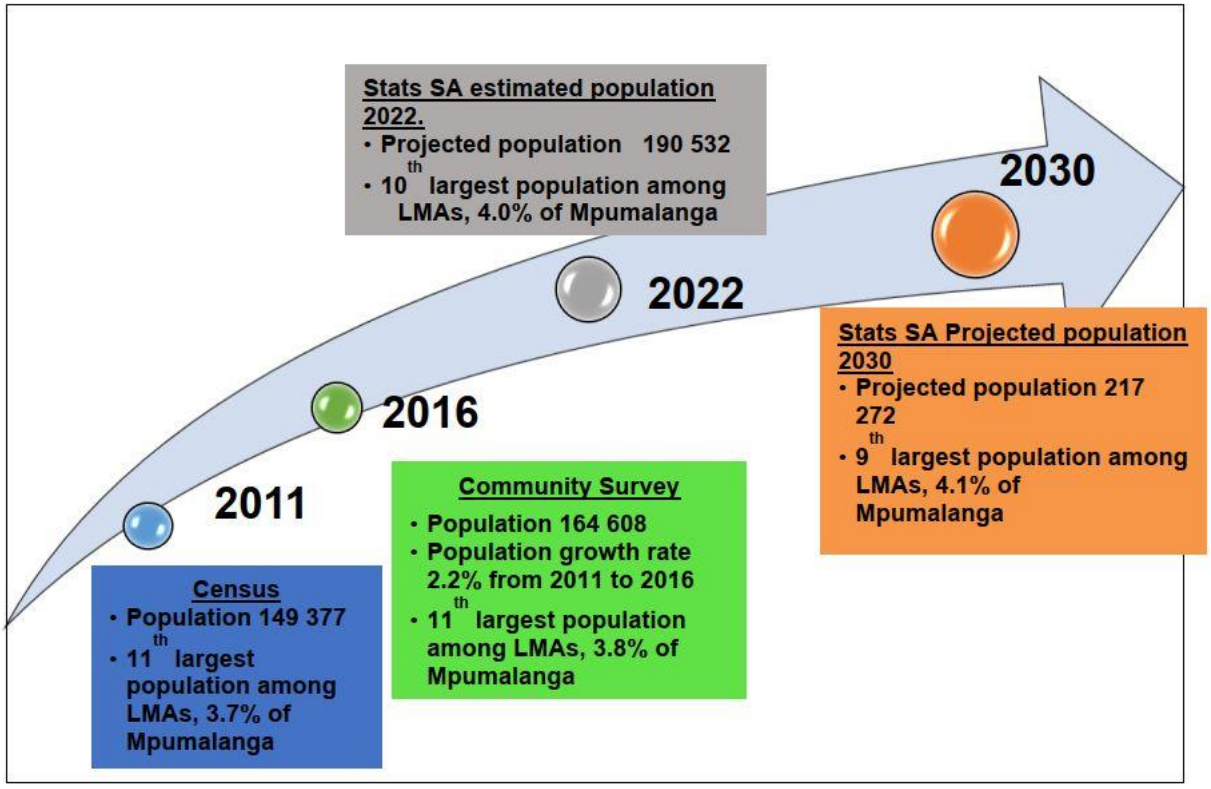


Figure 5-41 - Msukaligwa Population Data and Projection (Socio-economic profile by the Department of Economic Development and Tourism, 2022)

GENDER AND AGE PROFILE

According to the Statistics South Africa Community Survey 2016, most of the MLM has a young population (15-34 years), forming 41.2% of the total population. The general trend is a decrease in children between 5 and 14 years since 2001, with an increase in the 25-43 age group. This trend may indicate decreased birth rates / reduced population growth. The female population exceeds the male population by just over a per cent (51.1%). See **Figure 5-42** for the population pyramid.

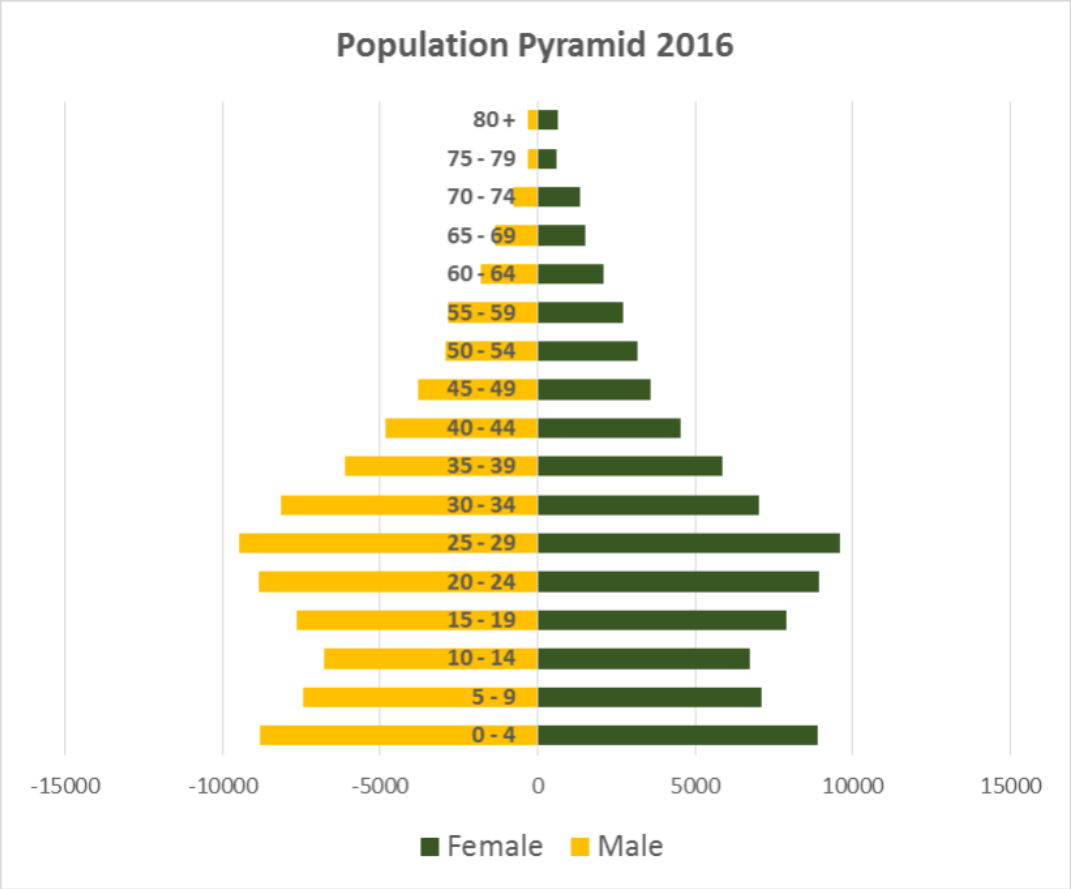


Figure 5-42 - Population Pyramid, 2016

EDUCATIONAL PROFILE

Table 5-5 indicates that 9.6% of persons without schooling decreased between 2011 and 2016. Despite this positive decrease, a population of children within the municipality remain uneducated. Msukaligwa's grade 12 pass rates decreased from 80.6% in 2014 to 76.4% in 2020. The pass rate decreased by 55.3% between 2020 and 2021, mainly due to Covid-19-related factors. The admission rate to university/degree studies deteriorated to 32.6% in 2021 regarding ranking in the province. In 2016, only 79.0% of students completed grade 7. However, there was a slight improvement in functional literacy within the municipality in 2020 when 85.6% of students over 15 years were recorded to have passed grade 7 (Msukaligwa Municipality, 2022).

There is also a challenge to accommodating the educated young people in the area as inadequate and inappropriate employment opportunities exist.

Table 5-5 – Educational Levels

Educational Indicators		
% Population 15+ with no schooling	2011	2016
	8.2 %	9.6 %

% Population 15+ with matric and post matric qualification		23.6 %		39.6%	
Grade 12 Pass Rate	2014	2020	2021	Admission to B degree studies	2021
	80.6 %	76.4 %	71.1 %		32.6 %
Functional Literacy rate					
Age 15yr+ and completed grade 7 or higher					
2011	2015			2016	2020
79.0 %	80.8 %			81.4 %	85.6 %

(Msukaligwa Municipality, 2022)

Educational Facilities

Msukaligwa Municipality has only one FET College. Considering the continuous population growth within the municipality and the shortage of skills within communities, there is a need for a tertiary institution within the district. MLM IDP indicates that with the development within the municipality comes a need for a high school at Ermelo Ext. 32, 33, 34 and New Ermelo area, Khayelihle, close to Emadamini and Thusi Ville, and additional Primary Schools, except for those mentioned in **Table 5-6**. The table also indicates an imbalance in the number of primary schools compared to the number of high schools (Statistics South Africa, 2011).

Table 5-6 – Educational Facilities

Educational Facility	Number
Primary Schools	71
High Schools	6
Combined Schools	12
Secondary Schools	11
Tertiary institutions	0
FET Colleges	1
Training Centres/Adults Education	9
No. of Private Schools	3
Day Care Centres	40

(Msukaligwa Municipality, 2022)

LABOUR PROFILE

Table 5-7 below indicates the labour force comparison within Msukaligwa Municipality from 2011 to 2016. The unemployment rate in the municipality stood at 23.6% in 2016, which decreased from 26.8% in 2011. Furthermore, data from 2016 showed a reduction in economically active persons compared to 2011 figures. This reduction in unemployment figures indicates that the labour market was absorbing more people, or it could have resulted from retirement rates as figures showed an increase in economically active people.

According to the Provincial Department of Economic Development and Tourism, the unemployment rate for females and males is 31.4% and 18.1%, respectively, with the youth being the highest at 34.5% in 2016. This information will assist when planning any developmental intervention within the municipality.

Table 5-7 – Employment Status

Employment Status	2011	2016
Employed	41 698	43 751
Unemployed	15267	15 084
Economically active	56969	53208
Not Economically active	51476	52565
Total	149 377	164 608

Statistics South Africa, Census 2011 and Community Survey 2016

Employment Sector Contribution

The municipality comprises sectors that contribute to the regional economy and employ the people of Msukaligwa and surrounding areas.

Table 5-8 below depicts that in 2020, the industries contributing to the increment in employment over the years include trade (22.0%), Community services (15.3%), finance (12.5%), manufacturing (10.4%) and mining (9.5%). Though there is a slight decrease in trade and community services, this played a role in the employment increase.

Table 5-8 – Employment per sector & Contribution to Regional (Gert Sibande) GVA

	2015		2020	
Sector	Employment	Contribution to GVA	Employment	Contribution to GVA
Agriculture	11.5%	14.6%	6.3%	18.5%
Mining	7.7%	11.5%	9.5%	5.6%
Manufacturing	0.8%	9.5%	3.0%	19.2%

	2015		2020	
Utilities	0.8%	9.5%	3.0%	19.2%
Construction	3.9%	7.4%	7.5%	17.0 %
Trade	23.7%	20.4%	22.7%	23.3%
Transport	6.9%	28.7 %	5.2 %	31.0 %
Finance	9.6%	24.3%	12.5%	24.5%
Community	19.0%	21.4%	15.3%	23.0%
Private Households	9.1 %	-	7.6 %	
Total	100%	13.4 %	100%	16.7 %

(Msukaligwa Municipality, 2022)

Inequality and poverty levels

From 2011 to 2016, Msukaligwa experienced an increase in impoverished people. According to Statistics South Africa, the poverty rate (individuals living in South Africa with less than R945 a month) was 38.2 %. Municipalities can collaborate with private entities to alleviate poverty through economic development interventions. The Gini Co-efficiency[3] has not improved from 2011 to 2016. This Gini Co-efficiency indicates high inequality in terms of income distribution. The total number of people living in poverty in 2011 was 56,823, slightly increasing to 60,213 in 2016. The absolute poverty Gap is 137 million Rands. This gap indicates that those living under the poverty line will have to collectively obtain a further R137 Million Rands to be over the threshold. (Statistics South Africa, 2016).

Table 5-9 – Population and People below the minimum living standard

Indicators	2011	2016
	0.61	0.61
Poverty rate[4]	33.6%	38.2 %
People in Poverty	56,823	60.213

[3] The Gini coefficient is a statistical measure of economic inequality in a population.
[4] The poverty rate is the ratio of the number of people (in a given age group) whose income falls below the poverty line

Indicators	2011	2016
Poverty gap (R Million)[5]	R137	

COMMUNITY HEALTH

According to the Msukaligwa municipality IDP, the Department of Health reported in 2013 that the HIV infection rate was 46.5% among the antenatal clients te[s]ted, which increased compared to the year 2012 with a rate of 34.4%. Msukaligwa IDP also indicates a shortage of health facilities, with only a single private hospital and one government hospital. See **Table 5-10** below for health facilities available within the municipality. (Msukaligwa Municipality, 2022).

Table 5-10 – Health Facilities

Facilities	Number
Private Hospitals	1
Primary Health Care Clinics	10
Mobile Clinics	4
Government Hospitals	1
Infectious Hospital (TB)	1
Dentists	4
Gynaecologist	1
Social Workers	12
Private Doctors	20

(Msukaligwa Municipality, 2022)

[5] The poverty gap index is a measure of the degree of poverty. It is defined as extent to which individuals on average fall below the poverty line, and expresses it as a percentage of the poverty line

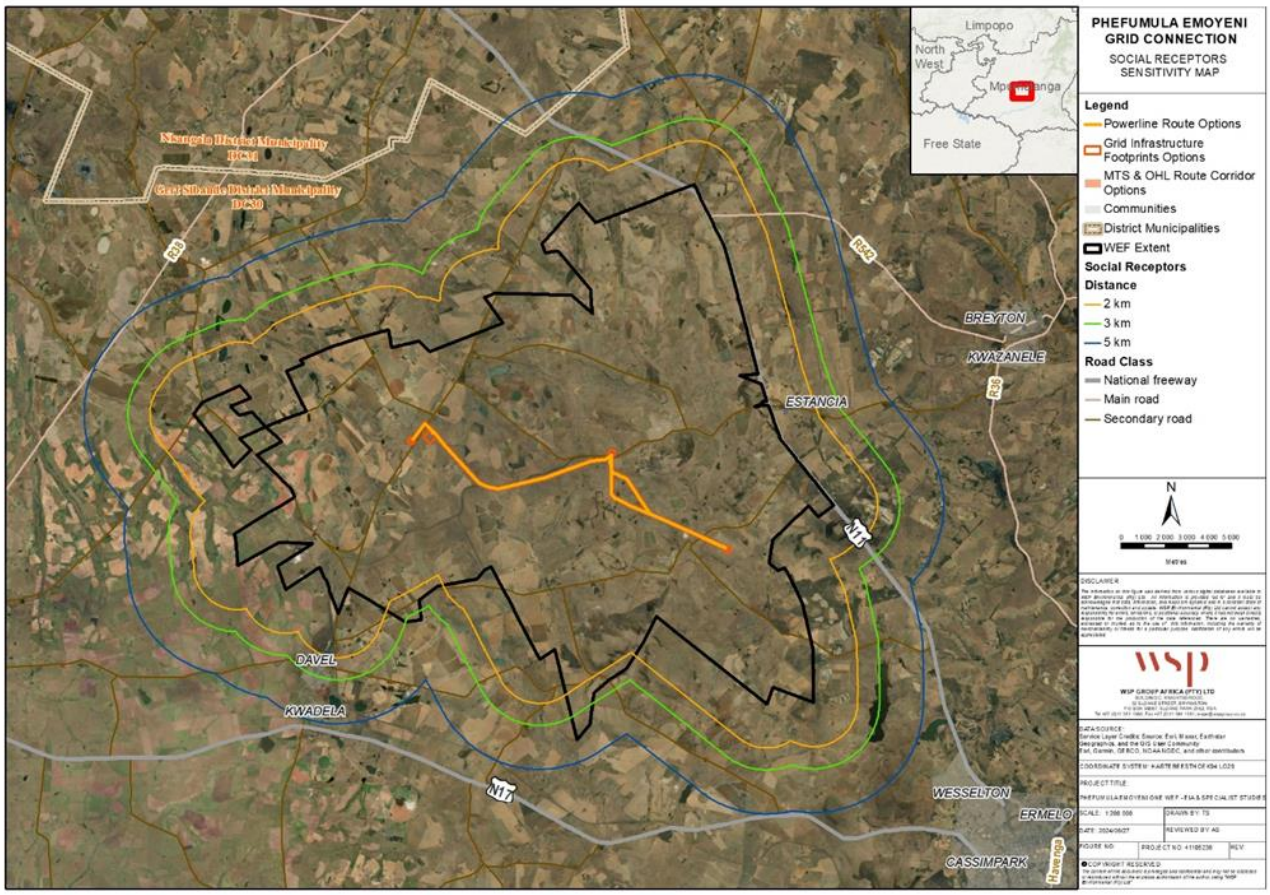


Figure 5-43 - Social Receptors Sensitivity Map

Figure 5-44 is a satellite image which indicates potentially sensitive social receptors within the 5 km radius of the boundary of the proposed project area. Kwa-Dela is a township within 5 km from the project boundary. It has an area extent of approximately 96 ha.

There are two provincial roads, one on the east of the Project, R542, connecting to Breyton. The other, R38, lies on the west side of the project area towards Hendrina, located in the Nkangala District Municipality. Within 3 km lies Davel, a small town with roughly a population 1193. New Street is the road that intercepts the town, connecting it to Kwa-Dela, which connects to the national road N17. Closer to the 2 km radius are several farms, agricultural farm buildings, farm dwellings, and the national road, N11.

5.4 SITE SENSITIVITY VERIFICATION

Specialist assessments were conducted in accordance with the Procedures for the Assessment and Minimum Criteria for Reporting on identified Environmental Themes, which were promulgated in Government Notice No. 320 of 20 March 2020 and in Government Notice No. 1150 of 30 October 2020 (i.e. “the Protocols”), or Appendix 6 of the EIA Regulations, depending on which legislation apply to the assessment under consideration.

A summary of the DFFE screening tool, the applicable legislation as well as the specialist sensitivity verification are detailed in **Table 5-11** below.

The complete Site Sensitivity Verification Report is included in **Appendix H**.

Table 5-11 - Assessment Protocols and Site Sensitivity Verifications

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Agricultural Impact Assessment	Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more	Medium Sensitivity	Confirmed High and Medium Sensitivity
Landscape/Visual Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	No sensitivity identified by the screening tool	Confirmed Medium to high Sensitivity
Archaeological and Cultural Heritage Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Low Sensitivity	Confirmed Medium to High Sensitivity
Palaeontology Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Very High to medium Sensitivity	Confirmed low to high sensitivity
Terrestrial Biodiversity Impact Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Biodiversity	Very High Sensitivity	Very High in Mixed Dry Grassland, Rocky Shrubland and Moist Grassland designated as CBA Irreplaceable and CBA Optimal. High in other areas of areas of Mixed Dry Grassland, Rocky Shrubland and Moist Grassland. Very Low in Old Lands, Cultivated Fields and Alien Tree Plantations.

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Aquatic Biodiversity Impact Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Aquatic Biodiversity	Very High Sensitivity	Confirmed Very High Sensitivity Conversely, the designation of catchments of wetlands in the central and south-eastern parts of the study area as very high is disputed. Although certain catchment areas of wetlands in this part of the study and investigation area consist of residual natural grassland, many areas are transformed primarily by crop cultivation and the sensitivity of these catchment areas is a lower sensitivity.
Civil Aviation Assessment	Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Civil Aviation Installations	High Sensitivity	Confirmed Low Sensitivity Compliance statement to be provided.
Defence Assessment	Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Defence installations	Low Sensitivity	Confirmed Low Sensitivity Compliance statement to be provided.
Geotechnical Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	No sensitivity identified by the screening tool	N/A
Socio Economic Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	No sensitivity identified by the screening tool	N/A
Plant Species Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Plant Species	Medium Sensitivity	Confirmed Medium Sensitivity Medium in areas of Mixed Dry Grassland, Rocky Shrubland and Moist Grassland.

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Animal Species Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Terrestrial Animal Species	High Sensitivity	Confirmed High Sensitivity High in areas of Mixed Dry Grassland, Rocky Shrubland and Moist Grassland.
Avifauna Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	High Sensitivity	Confirmed High Sensitivity

5.5 CONSOLIDATED SITE SENSITIVTY

The sensitivity input provided by specialists was utilised to compile a no-go map (**Figure 5-45**) which was utilised to prepare the preliminary layout for assessment in the EIA Phase.

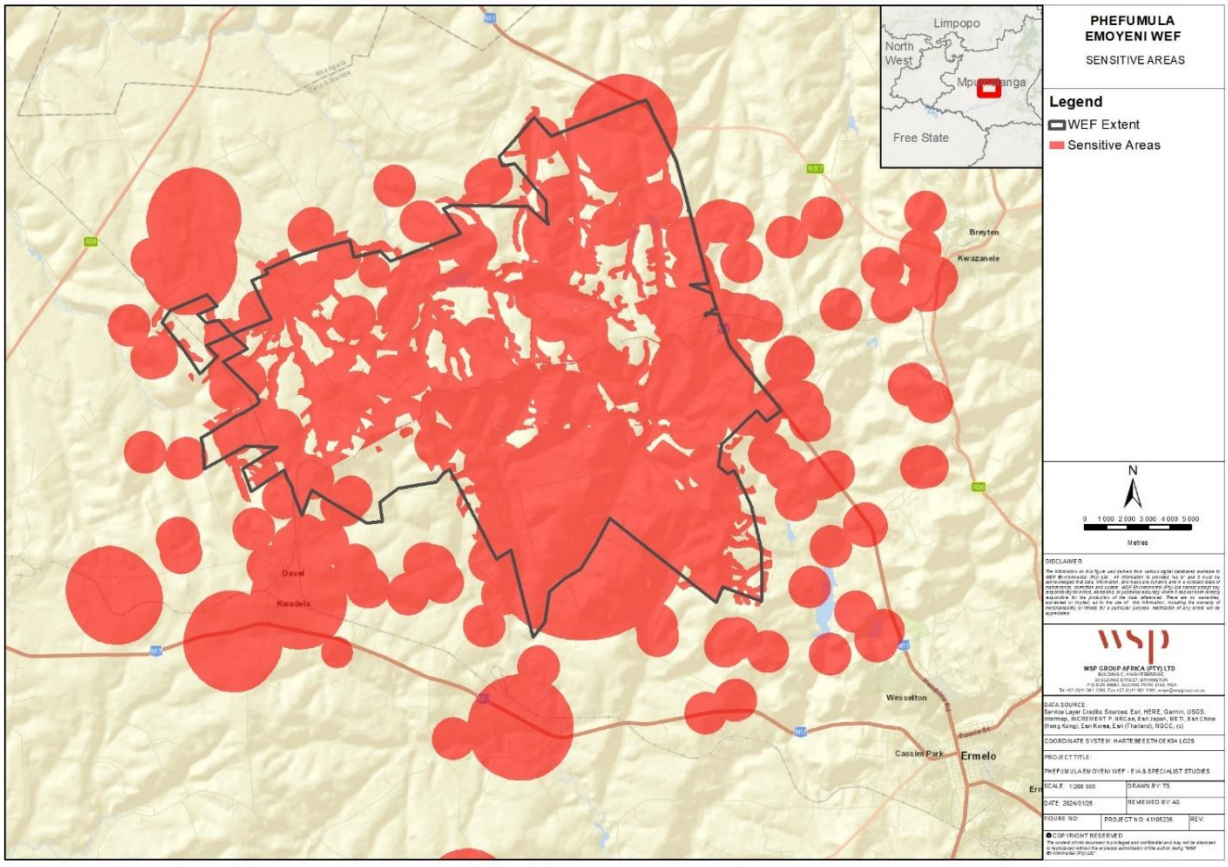


Figure 5-45 - Phefumula Emoyeni One No-go map

The preliminary layout and alignment for the electrical grid infrastructure is illustrated in **Figure 5-46.** The preliminary layout is overlaid onto the no-go map in **Figure 5-47.**

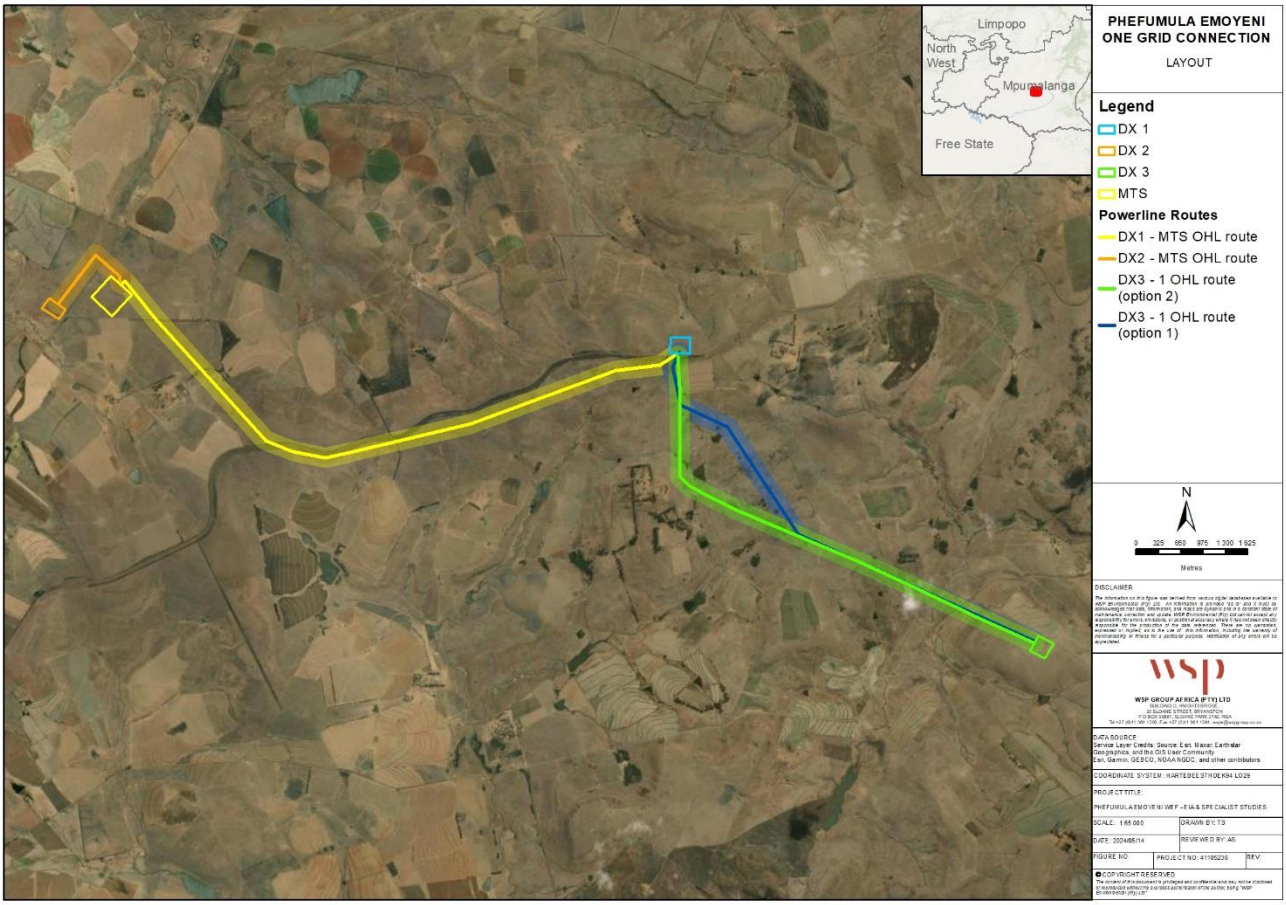


Figure 5-46 - Phefumula Emoyeni One electrical grid infrastructure - Preliminary Project Layout

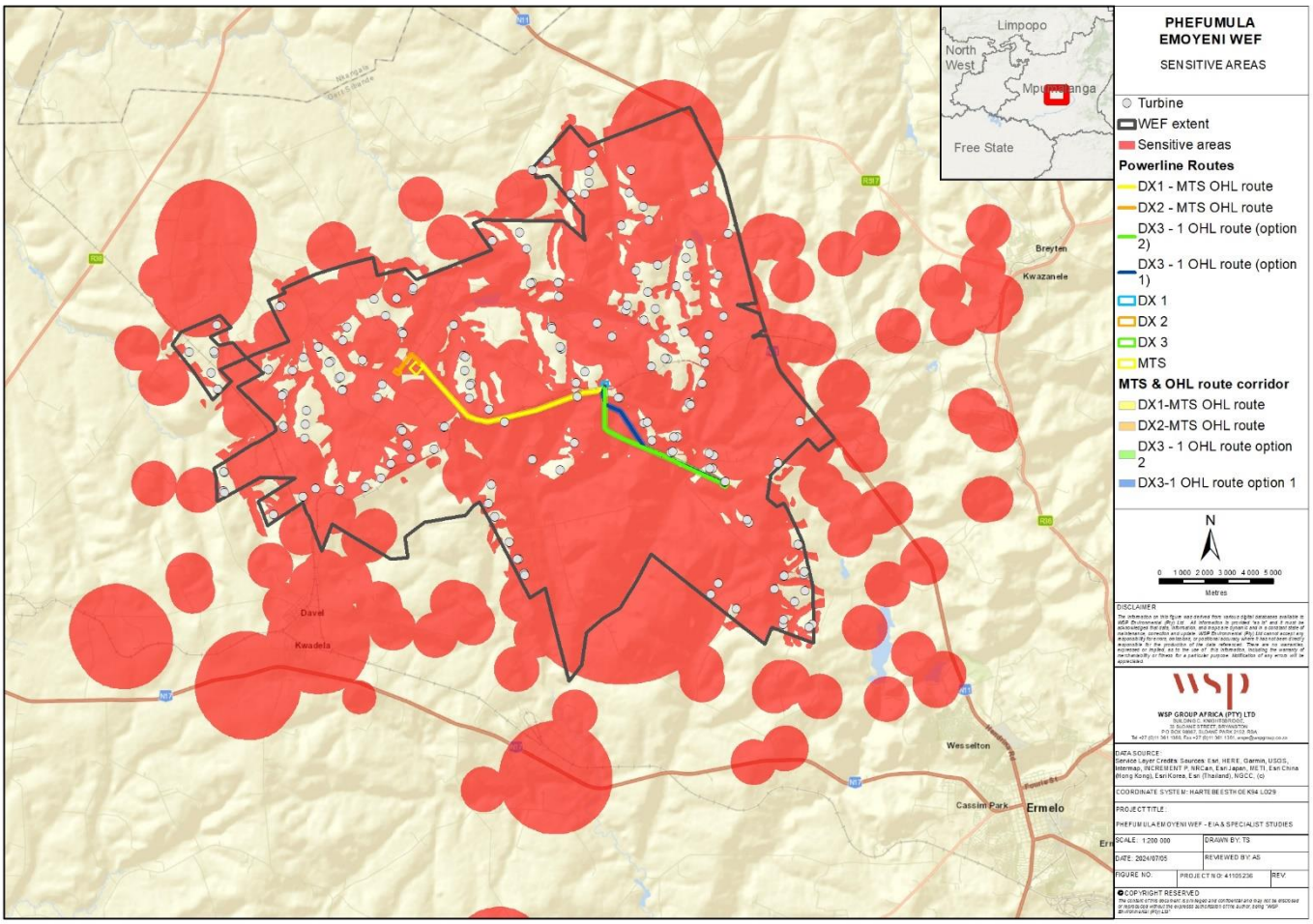


Figure 5-47 - Phefumula Emoyeni One WEF and Electrical Grid Infrastructure - Preliminary Project Layout overlain onto the No-Go map

Figure 5-48 below shows the consolidated site sensitivities for the scoping phase, with the preliminary electrical grid infrastructure layout overlain. The sensitivity inputs and findings from all of the appointed specialists have been combined and utilised to prepare this preliminary layout.

These sensitive areas identified will be utilised going forward into the EIA phase in order to plan and further refine the grid layout development to avoid all sensitive areas accordingly and minimise the impacts of the proposed project on in the area.

Figure 5-49 illustrates the sensitivities associated with the grid connection corridor.

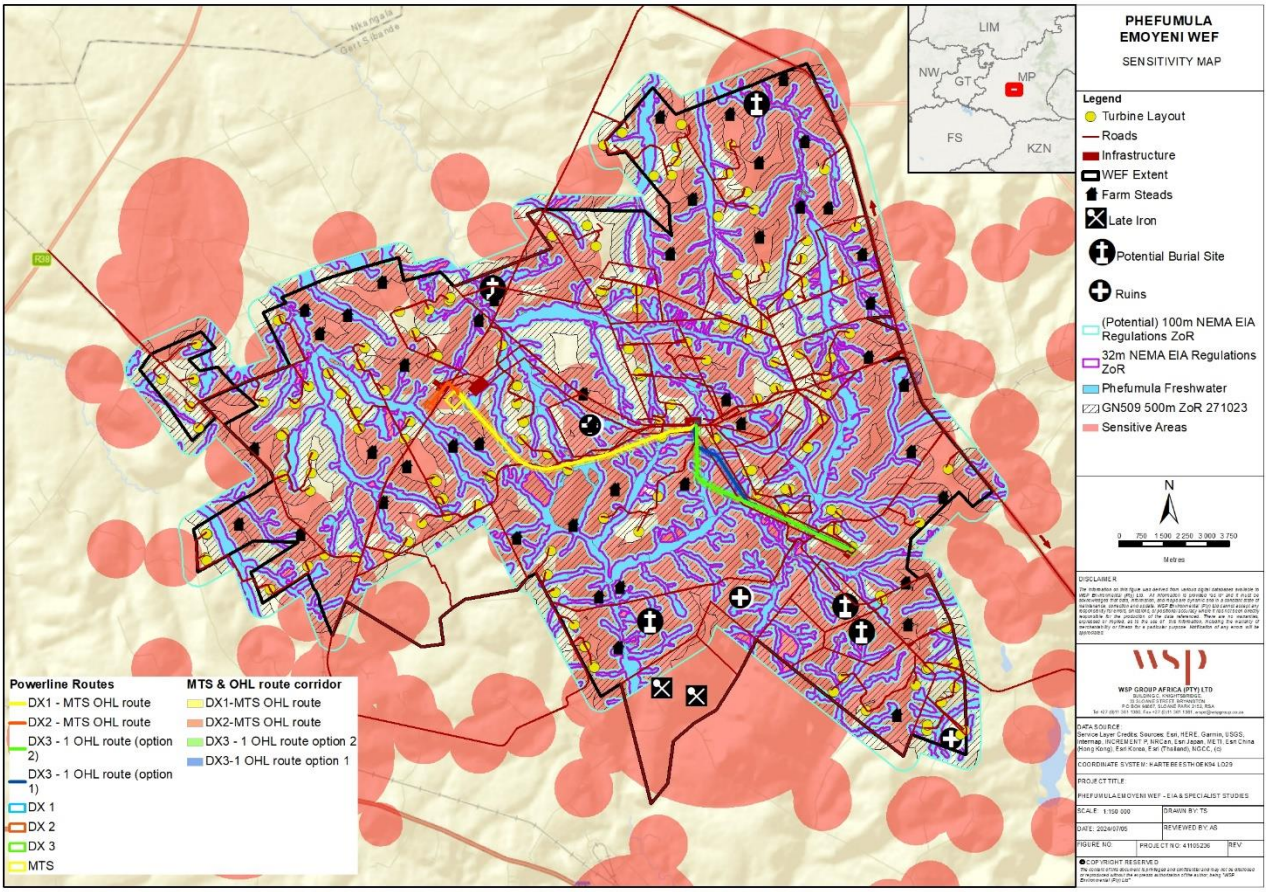


Figure 5-48 - Consolidated site sensitivity map

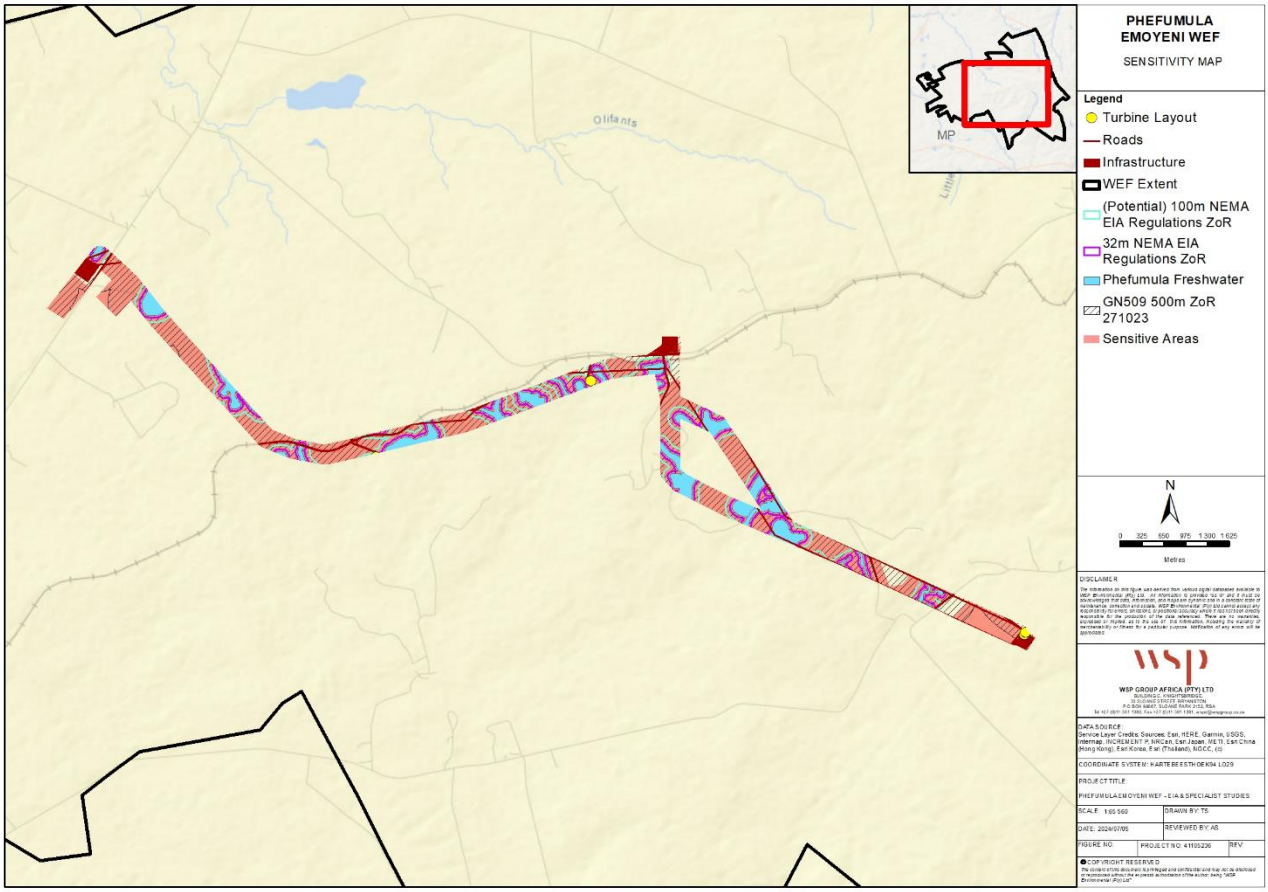


Figure 5-49 - Site sensitivity corridor map

6 POTENTIAL IMPACTS

6.1 IDENTIFICATION OF POTENTIAL IMPACTS

The scoping phase of a S&EIR process is aimed to identify potential impacts that are most likely to be significant and which need to be assessed. The determination of anticipated impacts associated with the proposed development is a key component to the S&EIR process. This Chapter identifies the anticipated environmental and social impacts associated with the proposed project.

The issues identified stem from those aspects presented in Section 5: Description of Baseline Environment and the description of project components and phases as outlined in Section 3: Project Description. Each significant issue identified is to be investigated further during the S&EIR process. Non-significant issues will be scoped out of the study with reasonable consideration given within the Scoping Report.

6.1.1 TOPOGRAPHY AND GEOLOGY

Construction Phase Impacts	**Soil erosion** ▪ Increase stormwater velocity. ▪ Increase in soil and wind erosion due to cleared vegetation. ▪ Creation of drainage paths along access tracks and side slopes. ▪ Sedimentation of non-perennial features and excessive dust. **Disturbance of fauna and flora** ▪ The displacement of natural earth material and overlying vegetation leading to erosion. ▪ Disturbance on natural fauna and flora ecosystems. **Oil spillages from heavy plant** ▪ Potential groundwater and drainage feature contamination. **Slope stability** ▪ Slope instability around structures. ▪ Steeply dipping joints in rock or boulders in soil mass may prove treacherous in cuttings and deep foundation excavation leading to collapse of sidewalls. ▪ Collapse of “soft” ground in excavation especially in areas below the water table. Can lead to fatality. **Seismic activity** ▪ Damage of proposed development. **Groundwater** ▪ Potentially undermine foundations and cause damage to structures.
Operational Phase Impacts	No impacts anticipated.
Mitigation Considerations	▪ Rehabilitation of affected areas (such as revegetation). ▪ Construction of temporary berms and drainage channels to divert surface water.

	▪ Minimize earthworks and fills. ▪ Use existing road network and access tracks. ▪ Correct engineering design and construction of gravel roads and culverts/drainage pipes at water crossings. ▪ Control stormwater flow. ▪ Proper moisture and density control during construction of embankments including adequate drainage in design. ▪ Use proper linings on embankments. ▪ Vehicle and construction machinery repairs to be undertaken in designated areas with proper soil protection. ▪ Avoid steep slopes areas. ▪ Design cut slopes according to detailed geotechnical analysis and adopt appropriate support mechanisms. ▪ Adopt safe wok procedures in excavation.
Recommended EIA Phase Studies	A “negative low to medium” impact was assessed, from a geotechnical perspective, for the pre-mitigation situation for the Phefumula Emoyeni One electrical grid infrastructure. connection.

6.1.2 SOILS, LAND CAPABILITY AND AGRICULTURAL POTENTIAL

Construction Phase Impacts	**Soil erosion** Some erosion will occur wherever soils are disturbed, especially if mitigation measures are not correctly put in place. The thin, hilltop soils and the less structured soils will be more vulnerable to erosion than the more clay-rich soils. Soil erosion can lead to sedimentation of the watercourses that cross the site, and to the loss of arable soil, especially topsoil, for rehabilitation purposes. Soil erosion mitigation measures that should be considered include phase-appropriate stormwater management plans and correct soil stripping, stockpiling and monitoring, with emphasis on quick revegetation of bare soils. Further to this, existing roads should be used and regraded. Soil erosion probability is thus definite and potential consequences severe, making the significance High. **Soil compaction** The more clay-rich soils identified on site will be more vulnerable to compaction than the sandier soils will be. Soil compaction reduces the pore space available for air and water within soil, reducing soil arability and increasing the risk of soil erosion. Soil compaction cannot be fully mitigated against as compacted soil cannot regain its original structure. Soils can be ripped to make them more suitable for cultivation. Soil compaction mitigation measures that should be considered include limiting vehicle routes on site by demarcating traffic areas and limiting vehicle access, and by stripping soils when they are dry. Reuse of existing roads will prevent additional areas from becoming compacted. Soil compaction probability is thus Definite and potential consequence Moderately Severe, making the significance Medium. **Soil contamination**

	The more clay-rich soils identified on site will be more vulnerable to contamination than the sandier soils will as the more clay-rich soils are more chemically active and will interact with the contaminants. All soils will be at risk of contamination, especially from hydrocarbons, as a result of the Project, especially during the construction phase. Contamination mitigation measures that should be considered will include proper handling and storage of hazardous materials, frequent vehicle maintenance, equipping onsite vehicles with drip trays, strict control of the potential contaminants entering the site and adequate waste disposal facilities on site. Soil contamination probability is Highly Probable and potential consequence Severe, making the significance Medium. At this stage no soils-related fatal flaws are evident for the proposed project.
Operational Phase Impacts	**Enhanced agricultural potential through increased financial security for farming operations.** Reliable income will be generated by the farming enterprises through the lease of the land to the grid infrastructure. This is likely to increase their cash flow and financial security and thereby could improve farming operations. **Interference with farming operations** Operational activities have some nuisance impact for farming operations but are highly unlikely to have an impact on agricultural production.
Cumulative Impacts	Cumulative impacts might occur due to the surrounding authorised projects in proximity to the study area. The footprint of these developments will likely be cumulative, with the ecological impact of all facilities operating in combination likely to exceed the sum of individual parts.
Mitigation Considerations	▪ Generic mitigation measures that are effective in preventing soil degradation are all inherent in the engineering of such a project and/or are standard, best-practice for construction sites. ▪ A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering design on site. Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there. As part of the system, the integrity of the existing contour bank systems of erosion control on croplands, where they occur on steeper slopes, must be kept intact. ▪ Any excavations done during the construction phase, in areas that will be re-vegetated at the end of the construction phase, must separate the upper 40 cm of topsoil from the rest of the excavation spoils and store it in a separate stockpile. When the excavation is back-filled, the topsoil must be back-filled last, so that it is at the surface. Topsoil should only be stripped in areas that are excavated. Across the majority of the site, including construction lay down areas, it will be much more effective for rehabilitation, to retain the topsoil in place. If levelling requires significant cutting, topsoil should be temporarily stockpiled and then re-spread after cutting, so that there is a covering of topsoil over the entire cut surface.
Recommended EIA Phase Studies	A detailed Agricultural Specialist Assessment would need to be undertaken during the EIA phase of the assessment. Refer to Section 7 of this Report for the Plan of Study for the Soil and Agricultural Impact Assessment.

6.1.3 AQUATIC SYSTEMS

Construction Phase Impacts	The construction of the project components will result in clearing of vegetation, levelling, and excavation / trenching. The removal of vegetation can result in exposure of bare soil to wind and rainfall leading to an increase in erosion potential. Generation of excess excavation material will require spoiling / stockpiling which can also lead to an increased risk of soil erosion. Rainfall on unconsolidated sediment has the potential to cause an indirect impact as runoff with higher sediment load entering surrounding drainage lines leading to sedimentation of watercourses and reduced water quality (due to increased turbidity). During construction, it is expected that the magnitude of the impact will be moderate and will require mitigation to reduce the risk. This has the potential to result in negative secondary impacts on receiving environments and ecosystem functioning. Surface water impacts associated with the proposed grid connection relate to: ▪ Altered freshwater ecosystem habitat and ecological structure; ▪ Changes to sociocultural and service provision; ▪ Altered biotic integrity and disturbance to ecosystem function; ▪ Impacts on the hydrology and sediment balance of the freshwater ecosystems; ▪ Altered water quality. Stormwater runoff could, in the case of the temporary construction yards and laydown areas, potentially come in contact with areas dedicated for the handling of contaminants such as fuel storage areas or in the case of the substations, with areas where potential contaminants such as concrete is being handled. This could result in contaminated stormwater runoff being discharged downstream. During construction, it is expected that the magnitude of the impact will be low and will require mitigation to reduce the risk.
Operational Phase Impacts	Stormwater runoff in the vicinity of the substations could come into contact with dedicated areas where hazardous substances are handled such as fuels and oils which could result in contaminated stormwater runoff being discharged downstream. During the operational phase, it is expected that the magnitude of the impact will be low and will require mitigation to reduce the risk. In the operational phase, the potential impacts due to the additional hardened surfaces include erosion of the surrounding environment. Eroded soil particles carried to downstream water resources can also result in the decrease in quality of nearby watercourses, due to sedimentation. The impact significance in the operation phase is expected to be moderate. During the operation of the grid connection, an increase in stormwater runoff is expected due to an increase in impervious surfaces, i.e., proposed roads and substation foundations. However, this increase in hardened surfaces can be considered as negligible. Therefore, very little to no increase in peak flow in the watercourses are expected, hence the impact significance is expected to be low.
Mitigation Considerations	Infrastructure Relocation Recommendation: ▪ In the context of the above mitigation measure, the proposed footprint / development area for the DX1 substation encroaches on the upper part of a seep wetland. It is strongly recommended that the development area for the proposed substation be relocated to ensure that the development area / footprint is located outside of the development high restriction area associated with the seep. It is suggested that the substation development area be relocated to the south of the district road currently located along the southern boundary of the substation development area; ▪ Furthermore, the implementation of sediment and stormwater controls over the entire duration of the construction phase, to prevent the transport of silt-laden runoff from being transported into downgradient freshwater ecosystems is highly important.

	▪ The implementation of dust control measures in the construction phase, related to cleared areas and areas in which vehicles move regularly, including unsurfaced construction access routes. ▪ The clear marking and physical demarcation of freshwater ecosystems and associated buffers in areas of active construction to prevent accidental / uncontrolled ingress into freshwater ecosystems; ▪ The creation and clear demarcation of a construction right of way where construction activities occur within, or in close proximity to freshwater ecosystems; ▪ The implementation of a clear construction waste control protocol in all areas of the construction area that is strictly enforced; ▪ Storing of all hazardous materials used for construction in areas away from freshwater ecosystems and associated buffers and the storage of such materials in contained or bunded spaces; ▪ The implementation and strict enforcement of spill protocol to ensure that spills of hazardous and potentially polluting materials are properly remediated and correctly disposed of; ▪ The regular maintenance and control of machinery and vehicles and the immediate removal and repair of leaking machinery / vehicles from the construction site; ▪ All mobile machinery operated near or within freshwater ecosystems that could leak fuel or oils (e.g. mobile generators) must be operated on drip trays; ▪ The prevention of any fires / open flames on the construction site and the education of construction personnel regarding the risk of fires. ▪ Control and undertaking of cement mixing in a way that does not result in an impact on freshwater ecosystems, in particular ensuring that batching areas are placed as far away from freshwater ecosystems as possible. the implementation of containment in cement mixing / batching areas and the implementation of adequate stormwater control and containment, especially in batching areas. ▪ It is strongly recommended that no new roads be developed along the proposed power line alignments and that existing farm roads must be utilised as far as possible to gain access to pylon / tower positions and to substation locations. ▪ The potential impact associated with access roads will be strongly mitigated if existing farm access roads were to be utilised and upgraded, if necessary, thus ensuring that the proposed road crossings are located within already impacted parts of the freshwater ecosystem reaches; ▪ New access roads must be aligned to avoid as far as possible any freshwater ecosystem and the associated 100m buffer. According to the MBSP Handbook (2014) no roads should be constructed through or around more than 20% of the edge of CBA wetlands or their buffers; ▪ If new crossings are required to be developed, or if existing crossing structures are expanded / upgraded, crossing structures must be designed to minimise the downstream and upstream impacts on the freshwater ecosystem through the installation of sufficient culverts to ensure flows are not impounded and to allow the movement of biota along reach; ▪ If drift-type structures are designed, the level of the drift must be the same as the bed of the freshwater ecosystem to facilitate the movement of biota and to prevent a change in levels which could lead to scour and the development of erosion; ▪ In steep terrain access roads must not be designed to run directly down the slope, rather perpendicular to the slope, and adequate stormwater controls must be installed as part of the road design. ▪ In the case of power line development the alignment must be designed /aligned to ensure that no pylons are placed within the delineated extent of a freshwater ecosystem, including in the case of freshwater ecosystems being too wide to be singly spanned. ▪ Furthermore, pylon / tower placement must be kept out of the stipulated 100m buffer that forms part of the development high restriction zone where technically possible to

	further minimise the potential for indirect impacts associated with tower development to affect wetlands that are spanned; ▪ In the case of line stringing, machinery must not be permitted to enter any freshwater ecosystem for the purpose of stringing. ▪ Substation transformers must be stored in bunded areas, with the bunds able to hold>100% volume of the oil stored in the transformers.
Recommended EIA Phase Studies	A detailed aquatic biodiversity assessment will be carried out in the EIA phase. Refer to Section 7 of this Report for the Plan of Study for the Aquatic Biodiversity Impact Assessment. In addition, a Biodiversity offset strategy will be prepared as part of the EIA Phase and will address any significant residual impact on aquatic biodiversity (if relevant).

6.1.4 HAZARDOUS SUBSTANCES AND POLLUTANTS

Construction Phase Impacts	**Soil, groundwater, and surface water contamination** ▪ Potential exists for soil, groundwater and surface water contamination associated with potential releases of small quantities of environmental contaminants and hazardous substances. Sources of pollutants and release mechanisms include: ▪ Leakages of hydrocarbons (diesel and oil) from construction vehicles and heavy machinery (e.g., excavators and bulldozers). ▪ Loss of containment and accidental spillage associated with storage and handling of hydrocarbons, chemicals, and concrete. ▪ Runoff creates a preferential pathway and exposure of the above contaminants into the subsurface and water resources leading to a deterioration in water quality and secondary health impacts on aquatic ecosystems and water users.
Operational Phase Impacts	No impacts anticipated.
Mitigation Considerations	▪ Chemicals, hydrocarbon materials and hazardous substances maintained onsite must be managed in accordance with the Hazardous Substances Act (No. 15 of 1973) and its relevant regulations. ▪ All machinery and equipment should be inspected regularly for faults and possible leaks; these should be serviced off-site or in appropriately bunded areas. ▪ Spill kits must be available at all locations where hazardous substances are stored, handled, or used, and spills must be cleaned up immediately in accordance with an established protocol applicable to the material.
Recommended EIA Phase Studies	No further studies are recommended.

6.1.5 WASTE MANAGEMENT

Construction Phase Impacts	**Generation of General Waste** The table below provides a summary of the typical general waste types that are likely to be generated on site during construction. The presence of construction workers has the potential to increase litter on site in the absence of adequate waste receptacles. This

results in an unsightly working environment and possible entry into surrounding environment. Furthermore, waste materials may attract pest species / vectors into working areas leading to potential health implications for construction staff and community members.

Spoil material unsuitable for reuse as backfill and bedding material has the potential to disrupt land use and habitats if inappropriately manage or disposed illegally.

Waste generation (domestic waste, mixed industrial and metal waste) and a lack of appropriate separation, temporary storage and recycling (i.e., not aligned with the Waste Hierarchy) has the potential to result in unnecessary waste material to landfill.

Waste Category	*Waste Type*	*Typical Constituents*
General Waste	Domestic Waste	Paper and cardboard packaging, empty plastic, and metal containers (non-hazardous original contents) etc.
	Organic Waste	Canteen, food and cooking waste
	Mixed Industrial	Wood, plastic, packaging etc.
	Metal Waste	Ferrous and non-ferrous scrap and stainless steel, metal cuttings, electrode stubs from welding.
	Spoil Material	Excavations, trenching and terracing will result in the generation of spoil material
	Building rubble	Wasted flooring material, paint containers, wall tiles, timber, piping etc.
	Biomass	Cleared vegetation

Generation of Hazardous Waste

The table below provides a summary of the typical hazardous waste types that are likely to be generated on site during construction. Hazardous waste generation and inappropriate management and disposal has the potential to lead to contamination of soil, groundwater, and surface water.

Waste Category	*Waste Type*	*Typical Constituents*
Hazardous Waste	Oily Waste	Used lubricant and hydraulic oils and hydrocarbon based solvents
	Oil Contaminated Waste	Solid material (rags etc.) that has come into contact with and contains traces of oil or grease
	Hazardous Chemical Containers	From temporary storage and use of chemicals on site
	Sanitary Waste	Sewerage / faecal matter generated at the contractor's camp

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Sanitation Waste

Sanitation services are required to accommodate workers on site, contractor's yard and at site camps along the route. Temporary ablution facilities (chemical toilets) are proposed to appropriately contain and treat waste for offsite disposal. The incorrect siting of chemical toilets (i.e., within 100m of a watercourse or stream) and loss of containment could lead to pollution of the receiving environment (soil, groundwater, and surface water), leading to secondary health impact to ecosystems and communities (ground and surface water users).

Sanitary waste, if not correctly contained, has the potential to enter surface water via runoff and increase organic matter loading in water systems.

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<tr><td>Operational Phase Impacts</td><td>

Generation of General Waste

The table below provides a summary of the typical general waste types that are likely to be generated on site during operation. Waste generation (domestic waste and mixed industrial) and a lack of appropriate separation, temporary storage and recycling (i.e. not aligned with the Waste Hierarchy) has the potential to result in unnecessary waste material to landfill. However, it is noted that only small volumes of waste are anticipated to be generated by the facility during operations.

Waste Category	*Waste Type*	*Typical Constituents*
General Waste	Domestic Waste	Paper and cardboard packaging, empty plastic and metal containers (non-hazardous original contents) etc.
	Organic Waste	Canteen, food and cooking waste
	Mixed Industrial	Wood, plastic, packaging etc.

Generation of Hazardous Waste

The table below provides a summary of the typical hazardous waste types that are likely to be generated on site during construction. Hazardous waste generation and inappropriate management and disposal has the potential to lead to contamination of soil, groundwater, and surface water.

Waste Category	*Waste Type*	*Typical Constituents*
Hazardous Waste	Oily Waste	Used lubricant and hydraulic oils and hydrocarbon-based solvents
	Oil Contaminated Waste	Solid material (rags etc.) that has come into contact with and contains traces of oil or grease

Sanitation Waste

Sewage and other wastewater generated from washrooms, etc. are similar to domestic wastewater. It is anticipated that the sewage will be discharged into conservancy tank.

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<tr><td>Mitigation Considerations</td><td>

- Despite the modest volumes of waste anticipated to be generated by the Project, recycling opportunities should be sought in order to reduce the volume of waste to landfill and harness commercial benefits for both the project team and local community.

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	▪ Provisions of suitable waste receptacles for temporary storage of general and hazardous waste (in compliance with Material Safety Data Sheets). ▪ Collection and disposal of hazardous waste at appropriately licences landfills and proof of disposal to be retained by contractors and facility operators.
Recommended EIA Phase Studies	No further studies are recommended.

6.1.6 TERRESTRIAL BIODIVERSITY

Construction phase impacts on terrestrial habitats and species largely arise because of direct impacts on the receiving environment due to clearing of land in advance of project development, and resultant loss of biodiversity. The earthworks and activities involved during the construction phase of the Project can potentially exert negative impacts on sensitive ecosystems, and flora and fauna species. Potential impacts primarily relate to vegetation clearing, direct species loss/mortalities, establishment and spread of alien and invasive species (AIS), sensory disturbances, and general anthropogenic influences associated with the construction of the proposed infrastructure.

Construction Phase Impacts	▪ Direct loss and disturbance of natural habitat. ▪ Establishment and spread of alien and invasive species. ▪ Direct loss of flora SCC. ▪ Fragmentation of fauna habitats. ▪ Soil erosion and sedimentation of drainage features. ▪ Injury, mortality and disturbance of fauna SCC.
Operational Phase Impacts	▪ Injury, mortality and disturbance of fauna SCC. ▪ Establishment and spread of alien and invasive species. ▪ Accidental wildfires from project infrastructure
Cumulative Impacts	Cumulative impacts might occur due to the surrounding authorised wind facilities in proximity to the study area. The footprint of these developments will likely be cumulative, with the ecological impact of all facilities operating in combination likely to exceed the sum of individual parts.
Mitigation Considerations	**Identification of Areas to be Avoided** ▪ Confirmed sites containing flora SCC that are listed on the national Red List as Vulnerable, Endangered or Critically Endangered should be avoided with a recommended buffer of 200 m; ▪ Areas of undisturbed natural Mixed Dry Grassland and Moist Grassland habitat that are designated as CBA should be avoided, as far as possible; and ▪ A loss/disturbance buffer zone of at least 100 m (or that indicated in the wetland specialist report) should be maintained between the maximum extent of construction works and the outer boundary of wetlands and riparian zones (Moist Grassland). **Minimisation** ▪ All temporary construction footprints, including equipment laydown areas, portable toilets, should only be located in areas of modified habitat (e.g., Cultivated Fields, Old Lands); ▪ A wet/growing season micro-siting walkdown of proposed Project development footprints should be conducted to identify sensitive biodiversity features that should

	be avoided, and inform micro-siting recommendations. Where feasible, permanent proposed Project infrastructure should always be located on land that is already modified/disturbed; ▪ Temporary construction access roads/tracks should be aligned with existing district and farm roads and tracks wherever possible; ▪ Vegetation clearing should be restricted to the minimum required Project footprints only, with no clearing permitted outside of these areas; ▪ The footprints to be cleared should be clearly demarcated prior to construction to prevent unnecessary clearing outside of these areas; ▪ No heavy vehicles should travel beyond the marked works zones; ▪ Install erosion prevention measures at sites where erosion is likely. Measures should include: ▪ Establishing low berms on approach and departure slopes to river/wetland crossings; ▪ Sediment traps and barriers along the lower edge of exposed soil surfaces; ▪ Use of geo-textiles, hay bales or brush-packing on exposed soil surfaces to reduce surface water flow, retain soils and soil moisture, and encourage natural revegetation; ▪ The wet/growing season micro-siting walkdown of proposed Project footprints should identify and assess the number of potentially impacted flora SCC and other sensitive biodiversity features. Based on the findings: ▪ Wherever possible, infrastructure footprints should be re-aligned/micro-sited to avoid SCC or other sensitive biodiversity features; ▪ Permits should be obtained from the relevant authority to rescue and relocate impacted protected plants; ▪ Develop and implement an Alien Invasive Species Control and Eradication Plan for the proposed Project; ▪ Develop a rehabilitation protocol to guide the stabilisation and revegetation of all area disturbed by construction activities; ▪ Minimise the risk of accidental wildfires by: ▪ Regularly trimming tall woody vegetation that is in close proximity to proposed OHL; ▪ Regularly inspecting and replacing damaged/faulty electrical infrastructure; ▪ Installing systems to detect faults to infrastructure electrical infrastructure; ▪ Engage with the local farmers to develop a co-ordinated grassland burning programme; ▪ Implement measures to protect all fauna, including specifically SCC. These could include: ▪ Prohibit off-road driving; ▪ Enforcing on-site speed limits for all construction and maintenance vehicles; ▪ Strictly prohibiting hunting and snaring of fauna by on-site workers; and ▪ Retaining an Environmental Control Officer (ECO) on-site during construction to manage any fauna-human interactions. **Biodiversity Management/Action Plan** ▪ All mitigation and management measures related to terrestrial biodiversity and fauna and flora SCC, should be synthesised in a Biodiversity Management/Action Plan; ▪ The Biodiversity Management/Action Plan should also include: • Additional conservation measures, such as biodiversity offsetting, that may be required; and • Implementation schedules, key performance indicators, monitoring protocols and implementation costs. **Monitoring Requirements**

	▪ Annual on-site AIS monitoring should be conducted during construction, operations and decommissioning. Monitoring should be used to inform the need and scope of follow-up AIS control; and ▪ Annual rehabilitation monitoring should be conducted of all disturbed and rehabilitated areas. Monitoring should be used to inform the need and scope of additional rehabilitation interventions. ▪ A Biodiversity offset strategy will be prepared as part of the EIA Phase. The main mitigation measures, other than required Management Plans for plant rescue, rehabilitation, and alien plant management, are related to infrastructure location, which is a planning phase measure. Specific recommendations will form part of the outcome of the EIA.
Recommended EIA Phase Studies	A detailed terrestrial ecological assessment will be carried out in the EIA phase. Refer to Section 7 of this Report for the Plan of Study for the Terrestrial Ecology Impact Assessment. In addition, a Biodiversity offset strategy will be prepared as part of the EIA Phase and will address any significant residual impact on terrestrial biodiversity.

6.1.7 AVIFAUNA

The effects of an electrical grid connection on birds are highly variable and depend on a wide range of factors, including the specification of the development, the topography of the surrounding land, the habitats affected, and the number and species of birds present.

Construction Phase Impacts	Total or partial displacement due to noise disturbance and habitat transformation associated with the construction of the grid and associated infrastructure.
Operational Phase Impacts	▪ Total or partial displacement due to habitat transformation associated with the presence of the grid and associated infrastructure. ▪ Collisions with the wind turbines. ▪ Electrocutions at the on-site substation and on the overhead sections of the internal 132kV power line pylons. ▪ Collisions with overhead sections of the internal 132/400kV powerlines.
Cumulative Impacts	▪ Total or partial displacement due to disturbance and habitat transformation associated with the construction and decommissioning of the grid and associated infrastructure. ▪ Total or partial displacement due to habitat transformation associated with the presence of the grid infrastructure. ▪ Collisions with the132/400kV powerlines. ▪ Electrocutions and collisions with the on-site substations and internal 132kV powerlines.
Mitigation Considerations	▪ Restrict construction to the immediate infrastructural footprint. Access to remaining areas should be strictly controlled to minimise disturbance of EGI sensitive species. ▪ Minimise removal of natural vegetation and rehabilitate natural vegetation post-construction where possible. ▪ Prioritise upgrading existing roads (where the requisite roads authority permission has been issued) over constructing new roads. ▪ Apply noise and dust control measures according to best practice in the industry.

	▪ Strictly implement the recommendations of ecological and botanical specialists to reduce the level of habitat loss. ▪ Restrict construction to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of EGI sensitive species. Rehabilitate natural vegetation post-construction where possible. ▪ Once operational, vehicle and pedestrian access to the site should be controlled and restricted to the facility footprint as much as possible to prevent unnecessary destruction of vegetation. ▪ A vulture-friendly pole design should be used for the 132kV power lines, with appropriate mitigation measures for complicated pole structures (e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformer), as recommended by the Avifaunal Specialist. ▪ Apply insulation reactively in the substation if significant electrocutions of avifauna are recorded. ▪ Bird flight diverters should be installed on all the 132kV and 400kV overhead lines for the full span length of the earth wires (according to Eskom guidelines - five metres apart). Light and dark colour devices must be alternated to provide contrast against both dark and light backgrounds, respectively. These devices must be installed as soon as the conductors are strung. ▪ Restrict dismantling to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of EGI sensitive species. ▪ Apply noise and dust control measures according to best practice in the industry. ▪ Prioritise the use of existing access roads during the decommissioning phase and avoid construction of new roads where feasible. ▪ The recommendations of the ecological and botanical specialist studies must be strictly implemented, especially as far as limitation of the activity footprint is concerned. ▪ Biodiversity offset strategy will be prepared as part of the EIA Phase.
Recommended EIA Phase Studies	The EIA Phase will entail the implementation of four avifaunal surveys and a full assessment of the likely impacts and available mitigation options, based on the results of systematic and quantified monitoring, in line with the monitoring protocols. Refer to Section 7 of this Report for the Plan of Study for the Avifauna Impact Assessment. In addition, a Biodiversity offset strategy will be prepared as part of the EIA Phase and will address any significant residual impact on avifauna.

6.1.8 VISUAL AND LANDSCAPE

Construction Phase Impacts	During the construction phase of the proposed Phefumula Emoyeni One electrical grid infrastructure, there will be some visual impacts on motorists and inhabitants during the construction and decommissioning periods resulting from laydown areas, construction vehicles, dust and equipment. These impacts will be transitory in nature for the duration of construction /decommissioning and include the following: ▪ Presence of visually intrusive construction/decommissioning related activities and equipment in the landscape. ▪ Airborne dust due to construction/decommissioning activities and resultant dust settling onto surrounding landscape.
Operational Phase Impacts	The operation of the Phefumula Emoyeni One electrical grid infrastructure will have a visual impact on the following receptors: ▪ Reduction in visual resource value due to the presence of the visually intrusive grid connection and other project infrastructure in the landscape.

	▪ Light pollution at night due to safety lighting on top of pylons, and security lighting.
Cumulative impacts	▪ Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially alter the sense of place and visual character of the area; and ▪ Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially exacerbate visual impacts on visual receptors.
Mitigation Considerations	**Dust control:** ▪ Water down construction roads and large bare areas as frequently as is required to minimise airborne dust. ▪ Enforce a 40 km/h speed limit on site for all vehicles. ▪ Monitor dust fallout if any complaints are received, using appropriate dust monitoring programme. **Site management:** ▪ Ensure all construction areas are appropriately maintained and kept in tidy order. ▪ Reduce the number and size of material laydown and waste storage areas to the extent feasible, and barricade these from view with shade netting/similar if needed. ▪ Remove accumulated waste material and unused equipment from site as frequently as is feasible. ▪ Repair unsightly and ecologically detrimental erosion damage to steep or bare slopes as soon as possible and re-vegetate these areas using a suitable mix of indigenous grass species. ▪ Employ micro-siting and orientation of the grid connection and other infrastructure to group with existing infrastructure and already disturbed areas. ▪ Utilise security lighting that is movement activated rather than permanently switched on, to prevent unnecessary constant illumination. ▪ Plan the lighting requirements of the facilities to ensure that lighting meets the need to keep the site secure and safe, without resulting in excessive illumination. ▪ Reduce the height and angle of illumination from which lights are fixed as much possible while still maintaining the required levels of illumination. ▪ Identify zones of high and low lighting requirements, focusing on only illuminating areas to the minimum extent possible to allow security surveillance. ▪ Avoid up-lighting of structures by rather directing lighting downwards and focussed on the area to be illuminated. ▪ Fit all security lighting with ‘blinkers’ or specifically designed fixtures, to ensure light is directed downwards while preventing side spill. Light fixtures of this description are commonly available for a variety of uses and should be used to the greatest extent possible.
Recommended EIA Phase Studies	The scoping phase Visual Assessment report has assessed the visual impacts of the proposed grid connection and infrastructure. The EIA Phase study will entail updating the scoping phase VIA report and will include a review of the findings of the VIA in accordance with detailed site layouts and a comparative assessment of the layout alternatives provided. Following comments from the relevant stakeholders, the final report will be updated and submitted with the final EIA report. Refer to Section 7 of this Report for the Plan of Study for the Scoping Visual Assessment.

6.1.9 HERITAGE AND CULTURAL RESOURCES

Construction Phase Impacts	**Disturbance to Known Cultural Resources** Construction activities may lead to disturbance or destruction of cultural resources (archaeological and historical remains and sacred sites e.g. graves) should the development footprint encroach on identified cultural/heritage sites. **Chance find of Cultural Resources** Earthworks may accidentally expose unidentified subsurface fossil remains. This will result in a lost opportunity to preserve local cultural heritage and historical records should appropriate management measures not be in place (e.g. Chance Find Procedure).
Operational Phase Impacts	No impacts anticipated.
Mitigation Considerations	▪ Chance Find Procedure must be included in the EMPr. ▪ Areas of potential heritage sensitivities that are identified in the EIA phase, should be demarcated. ▪ The visual impact of the Project on the farmsteads that is older than 60 years and archaeological sites should be assessed by the Visual Specialist considering the sense of place and impact on the cultural landscape; ▪ Known burial sites should be demarcated and avoided with a minimum of 30m buffer zone. A grave management plan must be developed and implemented for the sites including an access protocol for family; ▪ Iron Age stone walled settlements should also be preserved in situ and avoided with a 30m buffer zone, alternatively a Phase 2 mitigation project will be required; and ▪ During the public participation and stakeholder consultation process facilitated by the EAP, advertisements & site notices must reference the NHRA and address heritage concerns from stakeholders.
Recommended EIA Phase Studies	A field-based Heritage Impact Assessment, as defined in section 38 of the NHRA, will be undertaken during the EIA phase of the assessment. Refer to Section 7 of this Report for the Plan of Study for the Scoping Heritage Assessment.

6.1.10 PALAEONTOLOGY

Construction Phase Impacts	The construction phase will entail surface clearance as well as excavations into the superficial sediment cover and underlying bedrock. The development may adversely affect potential fossil heritage within the study area by destroying, damaging, disturbing or permanently sealing-in fossils preserved at or beneath the surface of the ground that are then no longer available for scientific research or other public good.
Operational Phase Impacts	No impacts anticipated.
Mitigation Considerations	▪ The study area is of high paleontological sensitivity and additional studies are required for the EIA phase. ▪ If a chance find is made then all work must cease in the immediate vicinity of the find. The Environmental Control Officer must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). ▪ Mitigation of chance fossil finds reported by the Environmental Control Officer would involve the recording, sampling and / or collection of chance fossil finds and

	associated geological data by a professional palaeontologist during the construction phase of the development. ▪ The palaeontologist concerned with potential mitigation work would need a valid fossil collection permit from the relevant Heritage Agency and any material collected would have to be curated in an approved depository (e.g., museum or university collection).
Recommended EIA Phase Studies	The study area is of insignificant to moderate to very high paleontological sensitivity and according to the SAHRIS palaeontological sensitivity map must be subjected to a palaeontological assessment in the EIA phase. Refer to Section 7 of this Report for the Plan of Study for the Palaeontological Impact Assessment.

6.1.11 SOCIO-ECONOMIC

Construction Phase Impacts	**Job Creation** ▪ The job creation projection indicates that many low-skilled persons will be employed. Job creation will have a potential very high positive impact **The influx of Job Seekers** ▪ Additionally, the influx of people from different cultures and languages may impact the local culture, and family structures, leading to a sense of displacement for locals. The impact significance is rated as medium negative. **Procurement from Local Businesses** ▪ The Project and its employees will require procurement of goods and services for construction. This procurement will increase local economic growth. Local economic growth has the potential to have a medium positive impact. **Loss of Farmlands** ▪ The physical construction of the infrastructure discussed in the project description will require vegetation clearance. A portion of the area will be within the croplands. The loss of farmland could potentially negatively impact the local agricultural sector. The impact is rated as low negative. **Income for Affected Landowners** ▪ The extra revenue will mitigate the landowner/farmer's livelihood risk posed by droughts and fluctuating market prices for farm outputs and inputs. The added income is a substantial benefit to the impacted landowner. The impact is rated as medium positive. **Community Health, Safety, and Security** ▪ The movement of construction vehicles and increased human activity by workers may have a low negative impact on the community's health, safety and security. **Environmental Health** ▪ The construction activities will result in increased noise and dust and alter the visual aesthetics of the area. The effect is rated to be a low negative impact.
Operational Phase Impacts	**Job Creation** ▪ The job creation projection indicates that many low-skilled persons will be employed. The impact significance is rated as a potentially high positive impact.

	An influx of Job Seekers ▪ An increase in job seekers may increase pressure on the existing municipal infrastructure and services. The influx of job seekers can potentially affect the local community negatively. The significance is rated as a negative medium impact. **Procurement from Local Businesses** ▪ The Project and its employees will require procurement of goods and services for operations. It increases local economic growth when local entrepreneurs and businesses are procured for supplies and services. Local economic growth has the potential to have a medium positive impact. **Community Health, Safety and Security** ▪ The movement of vehicles and increased human activity may damage buildings and increase crime, theft or killing of livestock, and theft of farm produce. It could have a low negative impact on the community's health, safety and security. **Environmental Health** ▪ The operational activities will increase noise and alter the visual aesthetics of the area. The effect is rated to be a low negative impact **Energy Generation** ▪ The wind energy generated will be an alternative to coal-powered energy. Energy generation will have a high positive impact because the Project will produce renewable energy, less air-polluted emissions, and a more reliable energy source for the energy consumer.
Cumulative Impacts	Sense of place Local Services and Accommodation Local Economy
Mitigation Considerations	▪ Ensuring local communities (through formal channels such as ward councillors and Department of Labour) are made aware of the potential opportunities available during construction in order for expectations to be managed appropriately. ▪ Prioritisation of local labour through implementing contractor policies. ▪ Undertake a survey of industries and businesses in the local area to identify potential suppliers. ▪ Implement agreements with landowner. ▪ The project should employ security personnel onsite during construction to implement security. ▪ The developer and contractors must make HIV/AIDS awareness and prevention program development and implementation a condition of contract for all suppliers and sub-contractors.
Recommended EIA Phase Studies	Based on the Scoping Assessment, most social issues have been identified. A site visit will be undertaken during the EIA Phase of the Scoping Impact Assessment (SIA). The site visit will include interviews with key stakeholders and interested and affected parties. Refer to Section 7 of this Report for the Plan of Study for the SIA.

6.1.12 CLIMATE CHANGE

Construction Phase Impacts	**Greenhouse Gas Emissions** A GHG is any gaseous compound in the atmosphere that is capable of absorbing infrared radiation, thereby trapping and holding heat in the atmosphere. By increasing the heat in the atmosphere, greenhouse gases are responsible for the greenhouse effect, which ultimately leads to global warming and contributes to the negative effects of climate change. The manufacturing of the materials associated with the project, and associated transportation of materials to and from the construction areas will result in indirect GHG emissions. The exhaust emissions will contribute to the presence of GHGs in the atmosphere. Measures could be considered in respect of the construction phase i.e. attempting to implement GHG emissions reductions measures within the EPC contractor's activities. However, given the site locality, it is anticipated that typical measures (such as stipulating that the EPC contractor measure and report on their GHG emissions during construction and try to incentivise a reduction via the use of energy efficient trucks etc.) are unlikely to be practical or worth the effort (or cost). **Climate Risks and Vulnerability** Loss of topsoil and vegetation community due to soil erosion can be exacerbated by climate change as soil erosion is mostly the result of extreme but short rainfall events. Therefore, changes of precipitation intensity and frequency could exacerbate soil erosion processes.
Operational Phase Impacts	**Reduced Greenhouse Gas Emissions** Carbon dioxide (CO_2) is one of the major GHGs under the UN Framework Convention on Climate Change, and a priority GHG in terms of the National Environmental Management: Air Quality Act - Declaration of Greenhouse Gases as Priority Air Pollutants (GN. R710, 2017). CO_2 is emitted from the combustion of fossil fuels. There will be no GHG emissions directly associated with power generation from the facility in the operational phase due to the nature of the technology. **Contribution of cleaner energy to the National Grid** The project may be regarded as having a positive impact in terms of GHG emissions associated with the development of power generation capacity in South Africa i.e. less GHG emissions per unit of power contributed when compared to conventional fossil fuel derived power.
Mitigation Considerations	Due to the fact that the proposed development will have no impact on climate, mitigation measures are not deemed necessary. The implementation of the project can be regarded as having a mitigatory effect in terms of contributing to the curbing of South African's CO_2 emission increases.
Recommended EIA Phase Studies	No further studies are recommended.

6.2 CUMULATIVE IMPACT ASSESSMENT

Although the objective of the NEMA S&EIA process is to undertake an impact and risk assessment process, inclusive of cumulative impacts, which is essential to assessing and managing the

environmental and social impacts of projects, it may be insufficient for identifying and managing the incremental impacts on areas or resources used or directly affected by a given development from other existing, planned, or reasonably defined developments at the time the risks and impacts are identified.

IFC PS 1 recognizes that, in some instances, cumulative effects need to be considered in the identification and management of environmental and social impacts and risks. For private sector management of cumulative impacts, IFC considers good practice to be two pronged:

- Effective application of and adherence to the mitigation hierarchy in environmental and social management of the specific contributions by the project to the expected cumulative impacts; and
- Best efforts to engage in, enhance, and/or contribute to a multi-stakeholder, collaborative approach to implementing management actions that are beyond the capacity of an individual project proponent.

Even though Performance Standard 1 does not expressly require, or put the sole onus on, private sector clients to undertake a cumulative impact assessment (CIA), in paragraph 11 it states that the impact and risk identification process "*will take into account the findings and conclusions of related and applicable plans, studies, or assessments prepared by relevant government authorities or other parties that are directly related to the project and its area of influence" including "master economic development plans, country or regional plans, feasibility studies, alternatives analyses, and cumulative, regional, sectoral, or strategic environmental assessments where relevant*."

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities (IFC GPH).

Evaluation of potential cumulative impacts is an integral element of an impact assessment. In reference to the scope for an impact assessment, IFC's Performance Standards specify that "*Risks and impacts will be analysed in the context of the project's area of influence. This area of influence encompasses…areas potentially impacted by cumulative impacts from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location."* (IFC 2006).

A cumulative impact assessment is the process of (a) analysing the potential impacts and risks of proposed developments in the context of the potential effects of other human activities and natural environmental and social external drivers on the chosen Valued Environmental and Social Components (VECs) over time, and (b) proposing concrete measures to avoid, reduce, or mitigate such cumulative impacts and risk to the extent possible (IFC GPH).

Cumulative impacts with existing and planned facilities may occur during construction and operation of the proposed Phefumula Emoyeni One electrical grid infrastructure. While one project may not have a significant negative impact on sensitive resources or receptors, the collective impact of the projects may increase the severity of the potential impacts.

Therefore, a number of renewable energy developments within the surrounding area which have submitted applications for environmental authorisation (some of which have been approved and others now operational). It is important to note that the existence of an approved EA does not directly equate to actual development of the project.

The surrounding projects that have not already been awarded Preferred Bidder (PB) status under the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) Bid window 5 or the Risk Mitigation IPP procurement programme (RMIPPPP), are still subject to the REIPPPP bidding process or subject to securing an off taker of electricity through an alternative process. Some of the surrounding proposed projects secured EAs several years ago but have not obtained PB status (or a private off taker agreement) and as such have not been developed.

These existing surrounding projects of varying approval status have been detailed in **Figure 6-1.**

The proposed Phefumula Emoyeni One electrical grid infrastructure is not located within one of the promulgated Renewable Energy Development Zones (REDZ). The following renewable energy projects are located within a 55km radius of the site, and have been considered in the cumulative impact assessment:

- The Halfgewonnen solar photovoltaic (PV) facilities on portions 7,8,9 and 16 of the farm Halfgewonnen 190 IS (DFFE Ref: 14/12/16/3/3/2/2068) located 19km northeast of the site;
- The authorised Forzando North Coal Mine Solar PV Facility, 9.5MW, (DFFE Ref: 14/12/16/3/3/1/452) is located 13km north-west of the site;
- Eskom Arnot PV Facility at the Arnot Power Station on Remainder of Portion 24 of Reitkuil 491 JS near Middleburg in Mpumalanga (DFFE Ref: 14/12/16/3/3/2/760) is located 35km north of the site;
- Proposed establishment of the Haverfontein wind energy facility near Carolina, Mpumalanga Province (DFFE Ref: 12/12/20/2018/AM2) is located 42km Northwest of the site;
- Camden I Wind Energy Facility (WEF) (up to 200MW) (subject to a Scoping and Environmental Impact Reporting (S&EIR) process) (DFFE Ref: 14/12/16/3/3/2/2137) located approximately 28km southeast of the site;
- Camden I WEF Grid Connection (up to 132kV) (DFFE Ref: 14/12/16/3/3/1/2769) located approximately 28km southeast of the site;
- Camden Grid Connection and Collector substation (up to 400kV) (DFFE Ref: 14/12/16/3/3/2/2134) located approximately 28km southeast of the site;
- Camden I Solar (up to 100MW) (DFFE Ref: 14/12/16/3/3/2/2136) located approximately 28km southeast of the site;
- Camden I Solar Grid Connection (up to 132kV) (DFFE Ref: 14/12/16/3/3/1/2768) located approximately 28km southeast of the site;
- Camden II Wind Energy Facility (up to 200MW) (DFFE Ref: 14/12/16/3/3/2/2135) located approximately 35km southeast of the site;
- Camden II Wind Energy Facility up to 132kV Grid Connection located approximately 35km southeast of the site;
- Hendrina North WEF (up to 200MW) (DFFE Ref: 14/12/16/3/3/2/2130) located approximately 16km northwest of the site;

- Hendrina North Grid Infrastructure (up to 275kV) (DFFE Ref: 14/12/16/3/3/2/2128) located approximately 16km northwest of the site;
- Hendrina South WEF (up to 200MW) (DFFE Ref: 14/12/16/3/3/2/2131) located approximately 16km northwest of the site;
- Hendrina South Grid Infrastructure (up to 275kV) (DFFE Ref: 14/12/16/3/3/2/2129) located approximately 16km northwest of the site;
- Ummbila Emoyeni WEF (up to 900MW) (DFFE Ref: 14/12/16/3/3/2/2160) located approximately 10km southwest of the site;
- Ummbila Emoyeni Grid Connection (up to 400kV) (DFFE Ref: 14/12/16/3/3/2/2162) located approximately 10km southwest of the site; and
- Ummbila Emoyeni Solar Facility (up to 150MW) (DFFE Ref: 14/12/16/3/3/2/2161) located approximately 17km southwest of the site.

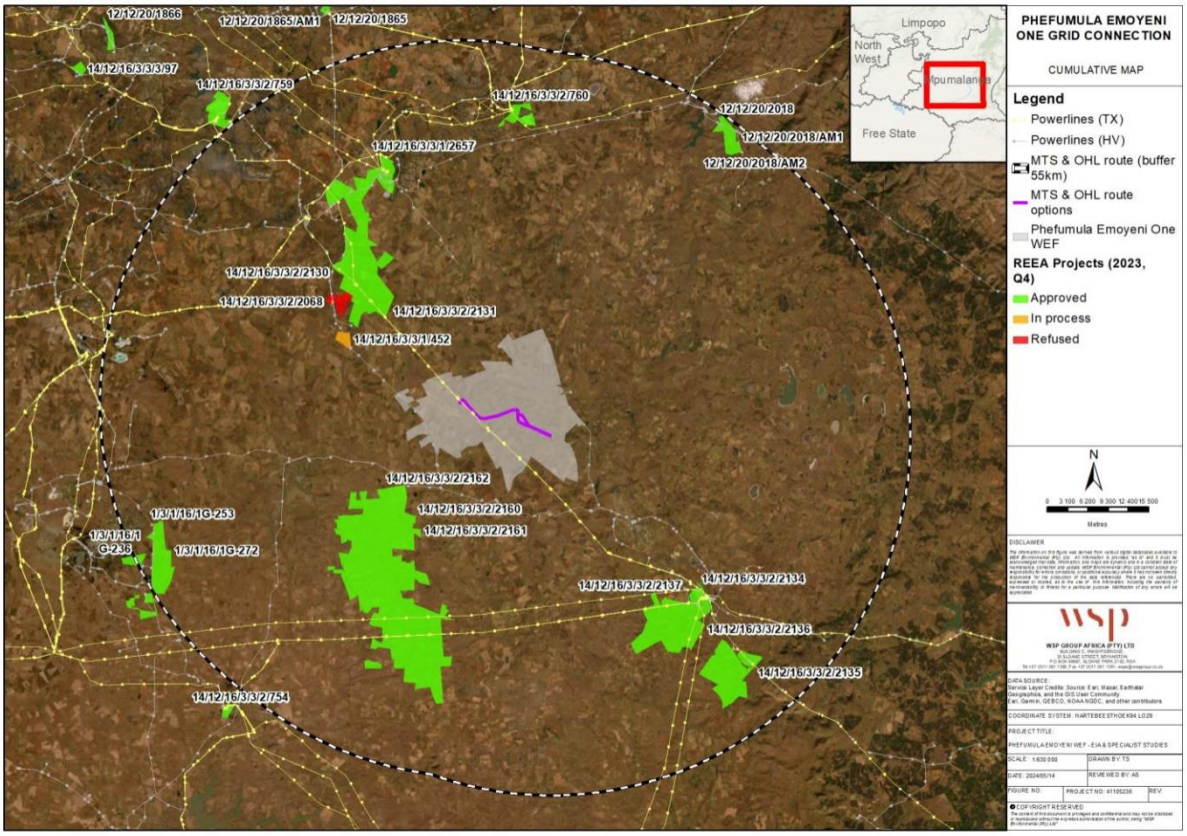

Figure 6-1 - Renewable Energy Projects within 55km of the Phefumula Emoyeni electrical grid infrastructure

Potential cumulative impacts have been identified in Section 6.1 and summarised in **Table 6-3** below. Other planned or existing projects that can interact with the Project will be identified during stakeholder engagement and finalisation of the S&EIA process.

6.3 SUMMARY OF IMPACT SIGNIFICANCE SCREENING

This section provides an overview of the likely significance of construction phase (**Table 6-1**:), operational phase (**Table 6-2**) and initial cumulative impacts (**Table 6-3**) presenting the results of the impact screening tool based on two criteria, namely probability and consequence (outlined in Section 2.5). This is used as a guide to determine whether additional assessment may be required in the EIA phase. Impacts will be refined and assessed during the EIA phase.

Table 6-1: Construction Phase Impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Geology	Soil Erosion	Negative	2	2	**Low**	Yes (Desktop Geotechnical)
	Disturbance of Fauna and Flora	Negative	3	2	**Medium**	
	Oil Spillages from Heavy Plant	Negative	2	2	**Low**	
	Slope Stability	Negative	2	2	**Low**	
	Seismic Activity	Negative	1	3	**Low**	
	Groundwater	Negative	2	1	**Very Low**	
Soils, Land Capability and Agricultural Potential	Soil erosion	Negative	4	3	**High**	Yes
	Soil compaction	Negative	3	3	**Medium**	
	Soil contamination	Negative	3	3	**Medium**	
Aquatic Systems	Site clearing and associated impacts (i.e. sedimentation, Dust generation).	Negative	3	2	**Medium**	Yes
	Taking of water from a watercourse for construction purposes	Negative	2	2	**Low**	
	General Construction activities	Negative	2	2	**Low**	
	Cement mixing / batching (construction).	Negative	2	2	**Low**	
	Development of Internal access roads.	Negative	2	3	**Medium**	
	Development of power lines	Negative	2	2	**Low**	
	Development of Substations	Negative	3	3	**Medium**	

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Hazardous Substances and Pollutants	Soil, groundwater and surface water contamination	Negative	5	3	High	No
Waste Generation	Generation of General Waste	Negative	3	2	Medium	No
	Generation of Hazardous Waste	Negative	3	2	Medium	
	Sanitation Waste	Negative	3	2	Medium	
Terrestrial Biodiversity	Direct loss and disturbance of natural habitat	Negative	4	3	High	Yes
	Establishment and spread of alien and invasive species.	Negative	3	2	Medium	
	Direct loss of flora SCC	Negative	3	4	High	
	Fragmentation of fauna habitats.	Negative	2	3	Medium	
	Soil erosion and sedimentation of drainage features.	Negative	2	2	Medium	
	Injury, mortality and disturbance of fauna SCC.	Negative	3	4	High	
	Injury, mortality and disturbance of fauna SCC. Due to increased vehicular movement	Negative	2	4	Medium	
Avifauna	Noise pollution and environmental disruption from construction activity	Negative	3	2	Medium	Yes
Bats	Roost disturbance or destruction	Negative	2	3	Medium	Yes
	Destruction, degradation, and fragmentation of and displacement from foraging habitat	Negative	4	3	High	
Visual and Landscape	Airborne dust due to construction/decommissioning activities and resultant dust settling onto surrounding landscape	Negative	3	2	Medium	Yes
	Presence of visually intrusive construction/decommissioning	Negative	3	2	Medium	

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
	related activities and equipment in the landscape					
Heritage and Cultural Resources	Disturbance to known Cultural Resources	Negative	3	2	**Medium**	Yes
	Chance Find of Cultural Resources	Negative	3	2	**Medium**	
Palaeontology	Chance Find of Palaeontological resources	Negative	3	1	**Low**	Yes
Traffic	Increase in development trips for the duration of the construction/ phase; associated noise and dust pollution. Possible damage to road surfaces by construction vehicles.	Negative	3	2	**Medium**	Yes
Socio-Economic	Job Creation	Positive	2	3	**Very high**	Yes
	The influx of Job Seekers	Negative	3	3	**Medium**	
	Procurement from Local Businesses	Positive	3	3	**Medium**	
	Loss of Farmlands	Negative	3	3	**Low**	
	Income for Affected Landowners	Positive	3	3	**Medium**	
	Community Health, Safety, and Security	Negative	3	3	**Low**	
	Environmental Health	Negative	3	3	**Low**	
Climate Change	Greenhouse Gas Emissions	Negative	2	1	**Very Low**	No
	Climate Risks & Vulnerabilities	Negative	2	1	**Very Low**	

Table 6-2: Operational Phase Impacts

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Soils, Land Capability and Agricultural Potential	Enhanced agricultural potential through increased financial security for farming operations	Positive	3	3	**Medium**	Yes

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
	Interference with farming operations	Negative	4	3	High	
Aquatic Systems	Operation of Substations	Negative	3	3	**Medium**	Yes
Waste Generation	Generation of General Waste	Negative	3	2	**Medium**	Yes
	Generation of Hazardous Waste	Negative	3	2	**Medium**	
	Sanitation Waste	Negative	3	2	**Medium**	
Terrestrial Biodiversity	Injury, mortality and disturbance of fauna SCC.	Negative	3	4	High	Yes
	Injury, mortality and disturbance of fauna SCC due to increase vehicular movement	Negative	2	4	**Medium**	
	Accidental wildfires from project infrastructure.	Negative	2	3	**Medium**	
Avifauna	Habitat transformation resulting from grid and associated infrastructure	Negative	3	3	**Medium**	Yes
	Electrocution of EGI sensitive species in the substations and/or on the 132kV power lines.	Negative	4	3	High	
	Collisions of EGI sensitive species with the 132kV/400kV power lines.	Negative	4	3	High	
Visual	Reduction in visual resource value due to presence of visually intrusive grid connection and other project infrastructure in the landscape	Negative	4	3	High	Yes
	Light pollution at night due to grid connection safety and project site security lighting	Negative	3	3	High	

Aspect	Impact	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Social	Job Creation	Positive	4	3	High	Yes
	An influx of Job Seekers	Negative	3	3	Medium	
	Procurement from Local Businesses	Positive	3	3	Medium	
	Community Health, Safety and Security	Negative	2	2	Low	
	Environmental Health	Negative	2	2	Low	
	Energy Generation	Positive	4	3	High	
Climate Change	Contribution of cleaner energy to the National Grid	Positive	4	3	High	No

Table 6-3: Initial Cumulative Impacts

Receptor	Description	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Noise and Vibrations	Cumulative Noise Emissions	Negative	4	3	High	Yes
Soils, Land Capability and Agricultural Potential	Cumulative Agricultural Impacts	Negative	4	3	High	Yes
Geology	Soil Erosion	Negative	2	2	Low	Yes (Desktop geotechnical)
	Disturbance of Fauna and Flora	Negative	3	2	Medium	
	Oil Spillages from Heavy Plant	Negative	2	2	Low	
	Slope Stability	Negative	2	2	Low	
	Seismic Activity	Negative	1	3	Low	
	Groundwater	Negative	2	1	Very Low	
Biodiversity (terrestrial and Aquatic)	Cumulative impacts on biodiversity	Negative	4	3	High	Yes

Receptor	Description	Nature	Probability	Consequence	Significance (Before Mitigation)	Further Assessment Required
Avifauna	Cumulative Collision impacts	Negative	4	3	**Very High**	Yes
	Cumulative Electrocution Impacts	Negative	4	3	**Very High**	
Visual	Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially alter the sense of place and visual character of the area	Negative	4	3	**High**	Yes
	Combined visual impacts from mining, industrial, infrastructural and renewable energy development in the broader area could potentially exacerbate visual impacts on visual receptors	Negative	4	3	**High**	
Social	Cumulative impact on sense of place	Negative	3	3	**Medium**	Yes
	Cumulative impact on local service and accommodation	Negative	3	2	**Low**	
	Cumulative impact on local economy	Positive	3	3	**Medium**	

7 PLAN OF STUDY FOR EIA

7.1 PLAN OF STUDY FOR EIA TERMS OF REFERENCE

Table 7-1: outlines the structure of the plan of study as required in terms of Annexure 2 of GNR 982.

Table 7-1: Plan of Study Requirements

Plan of Study Chapter	Information requirement as per GNR 982
Description of EIA Tasks	A description of the tasks that will be undertaken as part of the environmental impact assessment process.
Description of Alternatives	A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity.
Aspects to be Assessed in the EIA Process	A description of the aspects to be assessed as part of the environmental impact assessment report process.
Specialist Studies	Aspects to be assessed by specialists.
Impact Assessment Methodology	A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists. A description of the proposed method of assessing duration and significance.
Environmental Impact Report	Contents of EIAR as specified in GNR 982 (as amended) Annexure 2
Stakeholder and Authority Engagement	An indication of the stages at which the competent authority will be consulted. Particulars of the public participation process that will be conducted during the environmental impact assessment process.

7.2 OVERVIEW OF THE EIA PHASE TASKS

The EIA phase will consist of a number of tasks; each of these tasks is detailed separately in the following sub-sections:

- Specialist studies;
- Continuation of authority and stakeholder engagement;
- Assessment of the significance of potential impacts (including cumulative impacts); and
- Preparation of the EIA Report.

7.3 DESCRIPTION OF ALTERNATIVES

The EIA process identifies two types of project alternatives:

- Concept Level Alternatives, which relate to the site, technology and process alternatives.
- Detailed Level Alternatives, which relate to working methods and mitigation measures.

The feasibility of the higher-level concept alternatives have been considered and assessed within Section 2.5 of this FSR. The Detailed Level Alternatives will be addressed within the EIA Report.

7.4 ASPECTS TO BE ASSESSED IN THE EIA PROCESS

Table 7-2 outlines the key aspects that were identified in the scoping phase; these aspects will be subject to further assessment in the EIA Phase.

Table 7-2: Summary of aspects to be addressed in the EIA Phase

Environmental Aspect	Impact
Soils, Land Capability and agricultural Potential	Loss of agricultural potential by soil degradation
	Loss of agricultural potential by occupation of land
	Reduction in land available for cultivation and grazing animals
	Enhanced agricultural potential through increased financial security for farming operations
	Cumulative impacts
Aquatic Systems	Altered freshwater ecosystem habitat and ecological structure
	Changes to sociocultural and service provision
	Altered biotic integrity and disturbance to ecosystem function
	Impacts on the hydrology and sediment balance of the freshwater ecosystems
	Altered water quality
	Cumulative impacts
Terrestrial Biodiversity	Loss and Fragmentation of Vegetation and Habitat
	Impacts on CBAs and broad-scale ecological processes
	Loss and Displacement of Fauna
	Proliferation of alien invasive plant species
	Impact on provincial biodiversity frameworks
	Biodiversity Offset Strategy

Environmental Aspect	Impact
	Cumulative impacts
Avifauna	Displacement due to disturbance during construction
	Displacement of priority species due to habitat transformation as a result of the operation of the grid connection and associated infrastructure
	Mortality of priority species due to collisions and electrocution from OHPL and substations
	Cumulative impacts
Visual and Landscape	Visual impact during construction and decommissioning
	Potential alteration of the visual character of the area
	Potential visual intrusion resulting from pylons dominating the skyline in a largely natural / rural area
	Potential visual clutter caused by pylons and substations and other associated infrastructure on-site.
	Potential visual effect on surrounding farmsteads
	Potential alteration of the night-time visual environment as a result of operational and security lighting as well as navigational lighting on top of the pylons.
	Cumulative visual impacts
Heritage and Cultural Resources	Disturbance or destruction of cultural resources
Palaeontology	Physical disturbance of palaeontological sites
Socio-economic	Creation of local employment, training, and business opportunities
	Impact of construction workers on local communities
	Influx of job seekers
	Risk to safety, livestock, and farm infrastructure
	Increased risk of grass fires
	Nuisance impacts associated with construction related activities
	Impacts associated with loss of farmland
	Generate income for affected landowners
	Benefits associated with the socio-economic development contributions

Environmental Aspect	Impact
	Visual impact and impact on sense of place
	Potential impact on property values
	Potential impact on tourism
	Cumulative impact on sense of place
	Cumulative impact on local service and accommodation
	Cumulative impact on local economy

7.5 SPECIALIST STUDIES TO BE UNDERTAKEN

The following specialist assessments have been commissioned for the EIA Phase:

- Soils and Agricultural Potential Assessment;
- Terrestrial biodiversity Impact Assessment;
- Animal Species Assessment;
- Plant Species Assessment;
- Aquatic Impact Assessment;
- Avifauna Impact Assessment;
- Heritage and Palaeontological Assessment;
- Visual Impact Assessment;
- Desktop Geotechnical Assessment;
- Social Impact Assessment; and
- Biodiversity Offset Strategy.

It should be noted that the specialist studies will be undertaken according to the procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of Sections 24(5)(a) and (h) and Section 44 of the NEMA (GNR 320, dated 20 March 2020 and GNR 1150, 30 October 2020), where applicable.

7.5.1 AGRICULTURAL IMPACT ASSESSMENT

An agricultural impact is a change to the future agricultural production potential of land. In most developments, this is primarily caused by the exclusion of agriculture from the footprint of the development. Soil erosion and degradation may also contribute to loss of agricultural production potential. The significance of the impact is a direct function of the following three factors which will be assessed in the EIA phase;

- The size of the footprint of land from which agriculture will be excluded (or the footprint that will have its potential decreased)
- The baseline production potential (particularly cropping potential) of that land
- The length of time for which agriculture will be excluded (or for which potential will be decreased).

The loss of agricultural potential by soil degradation can effectively be prevented for Grid connection infrastructure by generic mitigation measures that are all inherent in the project engineering and/or

are standard, best-practice for construction sites. Soil degradation does not therefore pose a significant impact risk.

Due to the facts that the proposed development will exclude agricultural production from only a very small area of land, and that its negative impact is offset by economic and other benefits to farming, the overall negative agricultural impact of the development (loss of future agricultural production potential) is assessed here as being of low significance and as acceptable.

The agricultural protocol requires an indication of the potential losses in production and employment from the change of the agricultural use of the land as a result of the proposed development. As this assessment has shown, the agricultural use of the land will be integrated with the Grid connection infrastructure, and it will continue with no discernible change in terms of production. The expected losses in production and employment will therefore be zero.

Micro-siting

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. An aspect of Grid connection infrastructure layout that can cause unnecessary fragmentation of croplands is the location of access roads within croplands. This will be assessed in the EIA phase.

Cumulative Impact Assessment

The potential cumulative agricultural impact of importance is a regional loss (including by degradation) of future agricultural production potential.

The amount of loss of future agricultural production potential, which is acceptable in the area, and will the loss associated with the proposed development, when considered in the context of all past, present, or reasonably foreseeable future impacts, cause that level in the area to be exceeded. This will be assessed in the EIA phase.

The cumulative impact assessment will determine the quantitative loss of agricultural land if all renewable energy project applications within a 30 km radius become operational. The quantification of the cumulative impact will be done in detail in the EIA phase. This is highly likely to confirm that the cumulative impact of loss of future agricultural production potential is low.

7.5.2 TERRESTRIAL BIODIVERSITY ASSESSMENT

- The findings of the flora and fauna field surveys will be used to fully develop baseline terrestrial biodiversity, flora and fauna descriptions for the study area and proposed Project site.
- These data will be used in conjunction with the proposed Project infrastructure layout and activities to inform a full impact assessment of proposed Project activities and the identification of appropriate mitigation measures.
- These data will be presented within the respective specialist assessment reports, i.e., Terrestrial Biodiversity Specialist Assessment, Animal Species Specialist Assessment and Plant Species Specialist Assessment.
- The impact of the loss of CBAs and intact grassland habitat in terms of metapopulation dynamics will be assessed (ie. how the loss of source areas will impact areas of low quality habitat that cannot support a population of species on its own).

7.5.3 AQUATIC IMPACT ASSESSMENT

The following points highlight the envisaged components of the EIA-phase Aquatic freshwater report:

- An in-field assessment of freshwater ecosystems in the study area will be undertaken to gather data for the detailed assessment of potentially affected freshwater ecosystems and to further refine the desktop-based delineation of freshwater ecosystems in the study area;
- As part of the detailed assessment of wetlands proposed to be crossed by the proposed power lines and potentially affected by the proposed substations, the Ecological Importance and Sensitivity of these freshwater ecosystems will be determined according to the method described by Rountree and Kotze, (2013);
- As part of the detailed assessment of wetlands proposed to be crossed by the proposed power lines and potentially affected by the proposed substations, the ecological goods and services provided by these freshwater ecosystems will be assessed according to the method of Kotze et al (2009) in which services to the ecology of the study area as well as services to the people of the area are defined;
- As part of the detailed assessment of wetlands proposed to be crossed by the proposed power lines and potentially affected by the proposed substations, the Present Ecological State of these freshwater ecosystems will be assessed according to the resource directed measures guideline as advocated by Macfarlane et al., (2008) or DWAF (2007) as applicable;
- As part of the detailed assessment of wetlands proposed to be crossed by the proposed power lines and potentially affected by the proposed substations the Recommended Ecological Category (REC), Recommended Management Objective (RMO) and Best Attainable State (BAS) for these freshwater ecosystems will be assessed;
- All potential impacts identified in the scoping phase of the project will be assessed in detail according to the DWS Risk Assessment Matrix (2016) methodology and the impact assessment methodology provided by the EAP. The impact assessment will also consider cumulative and residual impacts;
- All alternatives as presented by the EAP for assessment (including the No Go alternative) will be comparatively assessed;
- All relevant and applicable mitigation measures will be refined;
- A statement regarding the acceptability of the proposed development from a freshwater context will be provided; and
- Recommendations for the EMPr or conditions to be included in the Environmental Authorisation will be made.

7.5.4 AVIFAUNA IMPACT ASSESSMENT

The following are proposed for the EIA Phase:

The avifaunal specialists report will be structured around the following terms of reference:

- The Species Environmental Assessment Guidelines, relevant BirdLife SA guidelines, relevant protocols for the specialist assessment and minimum report content, and MBSP land-use guidelines will be consulted and complied with.

- The impact of nocturnal and diurnal avifaunal collisions and electrocutions must be analysed separately.
- Describe the affected environment from an avifaunal perspective
- Discuss gaps in baseline data and other limitations and describe the expected impacts associated with the EGI
- Identify potential sensitive environments and receptors that may be impacted on by the proposed EGI
- Determine the nature and extent of potential impacts
- Identify 'No-Go' areas, where applicable
- Identification and assessment of the potential impacts of the proposed EGI development on avifauna including cumulative impacts.
- Provision of sufficient mitigation measures to include in the Environmental Management Programme (EMPr).
- Conclusion with an impact statement whether the EGI is fatally flawed or may be authorised.

7.5.5 HERITAGE AND PALAEONTOLOGICAL IMPACT ASSESSMENT

To comply with the NHRA and with cognisance of known heritage resources in the area, it is recommended that the final footprint should be subjected to a Heritage Impact Assessment (HIA). During this study, the potential impact on heritage resources will be determined as well as levels of significance of recorded heritage resources. The HIA should also provide management and mitigation measures, ensuring that all the requirements of the SAHRA are met. In order to compile an integrated HIA, the following requirements apply:

- The study area is of high paleontological sensitivity and additional studies are required for the EIA phase;
- The visual impact of the grid connection infrastructure on the farmsteads that is older than 60 years and archaeological sites should be assessed by the Visual Specialist considering the sense of place and impact on the cultural landscape;
- Known burial sites should be demarcated and avoided with a minimum of 30m buffer zone. A grave management plan must be developed and implemented for the sites including an access protocol for family;
- Iron Age stone walled settlements should also be preserved in situ and avoided with a 30m buffer zone, alternatively a Phase 2 mitigation project will be required; and
- During the public participation and stakeholder consultation process facilitated by the EAP, advertisements & site notices must reference the NHRA and address heritage concerns from stakeholders.

7.5.6 VISUAL IMPACT ASSESSMENT

The scoping phase VIA report has assessed the visual impacts of the proposed Phefumula Emoyeni One electrical grid infrastructure. The focus of the EIA phase assessment will be to update the scoping phase VIA report. The VIA is determined according to the nature, extent, duration, intensity or magnitude, probability and significance of the potential visual impacts, and will propose management actions and/or monitoring programs and may include recommendations related to the grid connection layout.

The VIA will also include the required landscape assessments.

The significance of the identified visual impacts will be further evaluated during the impact assessment phase, which will be done through the following:

Confirming the preliminary magnitude ratings of the individual impacts identified for the construction and operational phases, within the context of the existing visual landscape, in terms of the following:

- Visibility
- Visual intrusion
- Visual exposure

To this end, additional graphic representations of the project infrastructure within the existing landscape as seen from key locations within the study area will be generated.

Assessing the impact significance of each impact by relating the magnitude of the visual impact, before and after visual mitigation, to the following criteria:

- Impact extent
- Impact reversibility
- Impact duration
- Probability of occurrence

Based on the outcomes of the impact assessment, refining the preliminary mitigation measures identified in this report to reduce the potential negative visual impacts of the project, where feasible.

7.5.7 DESKTOP GEOTECHNICAL ASSESSMENT

The detailed geotechnical desktop assessment will include the following:

- Literature reviews of available published and unpublished information including, but not limited to, geological data, geological maps, topographical maps, aerial images and any existing geotechnical investigation reports of the study area.
- Assessment of geotechnical evaluation criteria, including excavation conditions across the sites, seismicity, undermining, engineering properties of the underlying geology, slope stability etc.
- Assessment of the relevant geotechnical and geological fatal flaws within the study area.
- Site reconnaissance to assess the ground conditions on site.

7.5.8 SOCIAL IMPACT ASSESSMENT

The Social Impact Assessment (SIA) methodology will be integrated into the environmental assessment process. The SIA will combine primary qualitative data collection and secondary research. The SIA process will piggyback on the public participation events and interactions to source qualitative social information required for the impact assessment.

Data Collection

To understand the socio-economic baseline conditions of the project-affected areas and the socio-economic implications of the proposed project to the receiving environment, a secondary desktop data collection will be conducted (desktop review) as well as primary data collection as part of the stakeholder consultation process.

Desktop Review

Available documents will be reviewed to obtain information regarding the socio-economic conditions in the study area. The documents reviewed include the following but not limited to:

- Recent Integrated Development Plans (IDPs) and Spatial Development Frameworks of the Msukaligwa Local Municipality and Gert Sibande Municipality.
- Socio-economic and demographic statistics sourced from Statistics South Africa, 2011, and the Statistics South Africa, Community Survey 2016.
- Documents concerning the proposed project, which included the project description document.
- Available maps and satellite imagery.
- These documents were used to develop the social baseline for the project.

Primary Data Collection

Public participation will be a primary data collection tool. The comments and response reports from the Environmental Authorisation process will be essential input into the SIA. The social team will provide specific information requirements for inclusion in the public participation process. An online focus group meeting will be conducted when required, and the public meeting will be used to inform the SIA further.

7.5.9 BIODIVERSITY OFFSET STRATEGY

The tasks that will be conducted in the preparation of the Biodiversity Offset Strategy include the following:

Data review and consolidation

A desktop review and gap analysis of the biodiversity baseline and impact assessment studies that will have been completed for the ESIA) and available (relevant global, national and regional) datasets will be used to derive a list of priority biodiversity features (species and ecosystems of concern, natural vs modified habitats) confirmed or with potential to occur within the Project area of influence, for which residual impacts are predicted, and offsets are required. At this stage, no new field-based baseline data gathering work is anticipated. Criteria that will be used to define species and ecosystems of concern for which offsets are required will include:

- Ecosystems considered unmodified or natural; or largely natural with few modifications;
- Representativeness: the uniqueness of ecosystems and habitats within the wider landscape;
- Resilience: the ability of the ecosystem to absorb change, persist, and maintain the same form;
- Habitats providing linkages and corridors to habitat of the same/different ecosystems (in contrast to a fragmented landscape);
- Statutory species (species protected by national/international legislation, agreements, conventions);
- Species listed as Critically Endangered, Endangered and Near Threatened on the IUCN Red List of Threatened Species (IUCN, 2019);
- Vulnerable (VU) species where there is uncertainty regarding the IUCN listing, and the actual status of the species may be critically endangered or endangered;
- Restricted range/endemic species;
- Migratory or congregatory species;

- Convention on the International Trade in Endangered Species (CITES)-listed species;
- Evolutionarily distinct species;
- Species that play a critical ecological role, represent guilds of species, or capture effects to other species with similar habitat requirements and sensitivities; and
- Species new or little-known to science.

Residual Impact Review and Offset Requirement determination

It is assumed that a number of significant residual impacts on species and ecosystems of concern are predicted – these are usually associated with permanent loss of natural habitat and/or CBAs, or significant impacts on fauna species of concern post-mitigation.

The possible offset requirements and options for the high-value biodiversity features and ecosystem services identified in the value assessment will be determined using the chosen offset loss-gain metric for the study area. At this point in time, it is anticipated that the most appropriate loss-gain metric may be a simplified, 'aggregated' site-based surrogate measure, that is, an 'area x condition'-based currency.

The chosen metric will form the basis of the calculations of no net loss (NNL) targets and/or Net Gain (NG) targets for each relevant species/ecosystem of concern on which significant residual impacts are predicted, based on the requirements set out in the National Biodiversity Offset Guideline.

Preliminary Biodiversity Offset Report

The focus of the preliminary report will be to set cumulative NNL and/or NG targets for identified relevant species/ecosystem of concern for which offsets are required, define and describe initial options for implementation of offsets, and outline proposed offset. A site visit will be conducted at this stage, in support of the identification and confirmation of candidate offset sites.

Following the setting of cumulative NNL and/or NG targets for identified relevant species/ecosystem of concern, the Additional Conservation Actions (ACAs) that will form the basis of the BOR's prescribed biodiversity offset management and monitoring measures will be defined, building upon existing implemented measures and plans (e.g. existing mitigation measures in the biodiversity impact assessments), and aligned with the Project's operation and decommissioning plans. Timeframes for implementation, budgets, and key performance indicators for monitoring will be set out for each of the defined ACAs for species/ecosystem of concern.

These initial options will be pitched to a level of detail that is suitable for use in the stakeholder engagement and public consultation phase that is integral to the participative development of an agreed offset area and activities.

Stakeholder Engagement

Relevant stakeholders will be identified, and a process established for their involvement in the design and management of the proposed biodiversity offset areas. Societal buy-in and participation is one of the main factors in determining the long-term success of an offset; therefore, questions on community needs in terms of what biodiversity local people would like to see conserved in the long term (e.g. woodlots for firewood harvest, sport fishing resources, emblematic species that could

support tourism activities) will be provided to the social specialist team for incorporation into the EIA public participation process.

It is envisaged that the following conservation agency stakeholders will be key to the process – particularly regarding agreement on metrics, candidate offset sites, and formation of the offset monitoring committee:

- Mpumalanga Tourism and Parks Agency (MTPA)
- BirdLife South Africa (BLSA)
- Endangered Wildlife Trust (EWT).

The outcomes of the stakeholder engagement activities will feed into the development of the final refined Biodiversity Offset Strategy.

7.6 IMPACT ASSESSMENT METHODOLOGY

The assessment of impacts and mitigation evaluates the likely extent and significance of the potential impacts on identified receptors and resources against defined assessment criteria, to develop and describe measures that will be taken to avoid, minimise or compensate for any adverse environmental impacts, to enhance positive impacts, and to report the significance of residual impacts that occur following mitigation.

The key objectives of the risk assessment methodology are to identify any additional potential environmental issues and associated impacts likely to arise from the proposed project, and to propose a significance ranking. Issues / aspects will be reviewed and ranked against a series of significance criteria to identify and record interactions between activities and aspects, and resources and receptors to provide a detailed discussion of impacts. The assessment considers direct,[6] indirect,[7] secondary[8] as well as cumulative[9] impacts.

A standard risk assessment methodology is used for the ranking of the identified environmental impacts pre-and post-mitigation (i.e., residual impact). The significance of environmental aspects is determined and ranked by considering the criteria[10] presented in **Table 7-3**.

Table 7-3: Impact Assessment Criteria and Scoring System

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
Impact Magnitude (M)	Very low:	Low:	Medium:	High:	Very High:

[6] Impacts that arise directly from activities that form an integral part of the Project.
[7] Impacts that arise indirectly from activities not explicitly forming part of the Project.
[8] Secondary or induced impacts caused by a change in the Project environment.
[9] Impacts are those impacts arising from the combination of multiple impacts from existing projects, the Project and/or future projects.
[10] The definitions given are for guidance only, and not all the definitions will apply to all the environmental receptors and resources being assessed. Impact significance was assessed with and without mitigation measures in place.

CRITERIA	SCORE 1	SCORE 2	SCORE 3	SCORE 4	SCORE 5
The degree of alteration of the affected environmental receptor	No impact on processes	Slight impact on processes	Processes continue but in a modified way	Processes temporarily cease	Permanent cessation of processes
Impact Extent (E) The geographical extent of the impact on a given environmental receptor	Site: Site only	Local: Inside activity area	Regional: Outside activity area	National: National scope or level	International: Across borders or boundaries
Impact Reversibility (R) The ability of the environmental receptor to rehabilitate or restore after the activity has caused environmental change	Reversible: Recovery without rehabilitation		Recoverable: Recovery with rehabilitation		Irreversible: Not possible despite action
Impact Duration (D) The length of permanence of the impact on the environmental receptor	Immediate: On impact	Short term: 0-5 years	Medium term: 5-15 years	Long term: Project life	Permanent: Indefinite
Probability of Occurrence (P) The likelihood of an impact occurring in the absence of pertinent environmental management measures or mitigation	Improbable	Low Probability	Probable	Highly Probability	Definite
Significance (S) is determined by combining the above criteria in the following formula:	$[S = (E + D + R + M) \times P]$ $Significance = (Extent + Duration + Reversibility + Magnitude) \times Probability$				

IMPACT SIGNIFICANCE RATING					
Total Score	**4-16**	**16-30**	**31-60**	**61-80**	**81-100**
Significance Rating (Negative (-)	**Very Low**	**Low**	**Moderate**	**High**	**Very high**
Significance Rating (Positive (+)	**Very low**	**Low**	**Moderate**	**High**	**Very high**

7.6.1 IMPACT MITIGATION

The impact significance without mitigation measures will be assessed with the design controls in place. Impacts without mitigation measures in place are not representative of the proposed development's actual extent of impact and are included to facilitate understanding of how and why mitigation measures were identified. The residual impact is what remains following the application of

mitigation and management measures and is thus the final level of impact associated with the development. Residual impacts also serve as the focus of management and monitoring activities during Project implementation to verify that actual impacts are the same as those predicted in this report.

The mitigation measures chosen are based on the mitigation sequence/hierarchy which allows for consideration of five (5) different levels, which include avoid/prevent, minimise, rehabilitate/restore, offset and no-go in that order. The mitigation sequence/hierarchy is shown in **Figure 7-1** below.

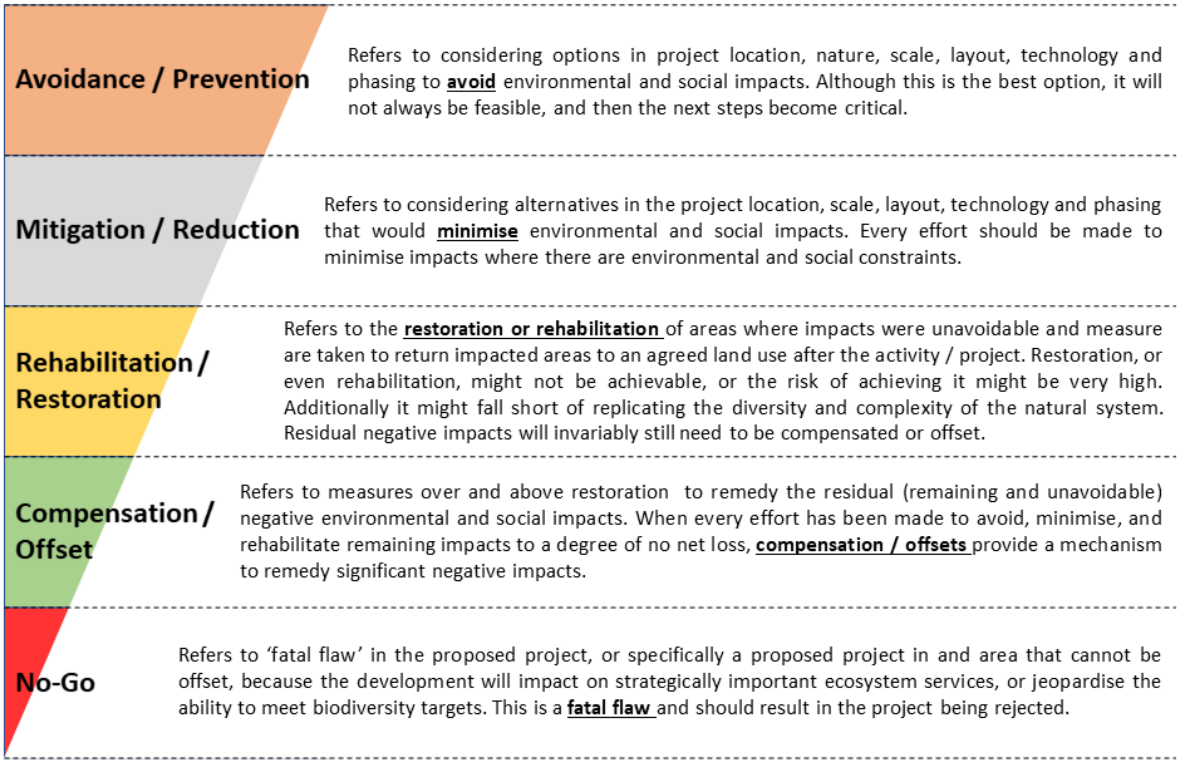

Figure 7-1: Mitigation Sequence/Hierarchy

The idea is that when project impacts are considered, the first option should be to avoid or prevent the impacts from occurring in the first place if possible, however, this is not always feasible. If this is not attainable, the impacts can be allowed, however they must be minimised as far as possible by considering reducing the footprint of the development for example so that little damage is encountered. If impacts are unavoidable, the next goal is to rehabilitate or restore the areas impacted back to their original form after project completion. Offsets are then considered if all the other measures described above fail to remedy high/significant residual negative impacts. If no offsets can be achieved on a potential impact, which results in full destruction of any ecosystem for example, the no-go option is considered so that another activity or location is considered in place of the original plan.

7.7 ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Once the FSR has been approved the proposed project will proceed into detailed EIA phase, which involves the detailed specialist investigations.

WSP will produce a Draft EIAR after the completion of the required specialist studies. The Draft EIAR will provide an assessment of all the identified key issues and associated impacts from the Scoping phase. All requirements as contemplated in the EIA Regulations, 2014 (GNR 982, as amended) will be included in the Draft EIAR.

The Draft EIAR will contain, inter alia, the following:

- Details of the EAP who prepared the report and the expertise of the EAP to carry out the S&EIR process, including a curriculum vitae;
- The location of the activity, including the 21-digit Surveyor General code of each cadastral land parcel, where available, the physical address and farm name; and the coordinates of the boundary of the property or properties;
- A plan which locates the proposed activity or activities applied for as well as the associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity, including all listed and specified activities triggered and being applied for; and a description of the associated structures and infrastructure related to the proposed project;
- A description of the policy and legislative context within which the development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- Details of the public participation process undertaken;
- A summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;
- The environmental attributes associated with the development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;
- The impacts and risks identified including the nature, significance, consequence, extent, duration and probability of the impacts;
- The methodology used in determining and ranking of potential environmental impacts and risks;
- Positive and negative impacts;
- An assessment of each identified potentially significant impact and risk;
- The possible mitigation measures that could be applied;
- An environmental impact statement;
- A description of any assumptions, uncertainties and gaps in knowledge;
- A reasoned opinion as to whether the proposed activity should or should not be authorised;
- An undertaking under oath or affirmation by the EAP; and
- An EMPr.

7.8 STAKEHOLDER AND AUTHORITY ENGAGEMENT

Stakeholder engagement during the EIA phase will focus on consultation with key stakeholders identified during the scoping phase which include the DFFE, BLSA, MDARDLEA, MTPA and EWT to address the issues raised during the scoping phase and also inform the biodiversity offset strategy.

Thereafter the public participation will revolve around the review of the environmental impact assessment findings, which will be presented in the Draft EIA Report. All stakeholders will be notified of the progress to date and availability of the Draft EIA Report, via mail, email and/or SMS. A legislated period of 30 consecutive days will be allowed for public comment. Reports will be made available in the following way:

Distribution for comment at central public places, which were used during the Scoping phase;
The document will be made available to download from the WSP website; and
Copies of CDs will be made available on request.

The EIA phase will provide the following information to I&APs:

- Initial Site Plan;
- Alternatives;
- A description of activities and operations to be undertaken;
- Baseline information;
- Specialist studies;
- Impact assessment;
- Management measures;
- Monitoring and measuring plan; and
- Closure details.

The information outlined above will be presented in one or more of the following:

- Notifications;
- Scoping Report;
- EIA Report; and
- EMPr.

All comments received during the EIA phase will be recorded in the comments and response section of the SER, which will be included in the draft and final EIA Reports. The final EIA Report will incorporate public comment received on the Draft EIA Report and will be made available for public review with hard copies distributed mainly to the authorities and key stakeholders.

All stakeholders will receive a letter notifying them of the authority's decision.

8 WAY FORWARD

This FSR contains:

- A description of the existing and proposed activities;
- A description of the alternatives considered to date;
- An outline of the proposed process to be followed;
- Information on the EAP and stakeholders who have chosen to participate in the project;
- An outline of the environment in which the project falls;
- Information on the potential environmental impacts to be studied in more detail during the EIAR phase of the project; and
- Information on the proposed specialist studies to be undertaken.

A number of environmental impacts have been identified as requiring some more in-depth investigation and the identification of detailed mitigation measures. Therefore, a detailed EIA is required to be undertaken in order to provide an assessment of these potential impacts and recommend appropriate mitigation measures.

WSP is of the opinion that the scoping report does not include sufficient information for the Competent Authority to make an informed decision at this stage.

The EAP's recommendation is that the DFFE accept the scoping report such that the EAP and specialists can further assess and mitigate the potential impacts, through consideration of biodiversity offsets, reducing the number of turbines and considering the addition of alternative technologies as well as through engaging with the relevant officials.

The recommendation of this report is that detailed specialist studies as outlined in Section 7.4 are undertaken.

The DSR was available for review from **26 July 2024 to 30 August 2024**. All issues and comments submitted to WSP have been incorporated in the SER of this FSR.

This FSR has been submitted to the delegated competent authorities responsible for authorising this project.

If you have any further enquiries, please feel free to contact:

WSP Group Africa

Attention: Ashlea Strong

Tel: 011 361 1392

E-mail: ashlea.strong@wsp.com

Building 1, Maxwell Office Park
Magwa Crescent West, Waterfall City
Midrand, 1685
South Africa

wsp.com