Appendix L

ENVIRONMENTAL MANAGEMENT PROGRAMME

Confidential

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Phefumula Emoyeni One (Pty) Ltd

PHEFUMULA EMOYENI ONE WIND ENERGY FACILITY (UP TO 550MW)

Draft Environmental Management Programme

Reference Number: 2025-02-0015



41105236
JUNE 2025

PUBLIC

Phefumula Emoyeni One (Pty) Ltd

PHEFUMULA EMOYENI ONE WIND ENERGY FACILITY (UP TO 550MW)

Draft Environmental Management Programme

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Phefumula Emoyeni One (Pty) Ltd

PHEFUMULA EMOYENI ONE WIND ENERGY FACILITY (UP TO 550MW)

Draft Environmental Management Programme

WSP

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

Phone: +27 11 254 4800

WSP.com

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Signature	-	-		
Checked by	Ashlea Strong	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: 2025.06.11 19:35:40 +02'00'	
Authorised by	Ashlea Strong	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: 2025.06.11 19:36:25 +02'00'	
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CONTENTS

GLOSSARY

1 INTRODUCTION 1

1.1 BACKGROUND INFORMATION 1
1.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER 4
1.3 PURPOSE OF THE EMPR 5
1.4 STRUCTURE OF THE EMPR 6

2 PROJECT DESCRIPTION 9

2.1 LOCATION OF THE PROPOSED PROJECT 9
2.2 ACTIVITY DESCRIPTION 18
2.3 REFINED LAYOUT 19
2.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES 22
2.5 NEED AND DESIRABILITY 25

3 ENVIRONMENTAL SENSITIVITY 30

3.1 SITE SENSITIVITY VERIFICATION SUMMARY 30
3.2 SENSITIVITY MAPPING 32
3.3 IMPACT ASSESSMENT OUTCOMES 39
3.4 BIODIVERSITY OFFSET STRATEGY 47
3.5 APPLICABLE DOCUMENTATION 48

4 GOVERNANCE FRAMEWORK 49

4.1 NATIONAL ENVIRONMENTAL LEGAL FRAMEWORK 49
4.2 POLICIES AND PLANS 63
4.3 PROVINCIAL AND MUNICIPAL LEGAL AND REGULATORY FRAMEWORK 67
4.4 INTERNATIONAL ENVIRONMENTAL AND SOCIAL STANDARDS 70

4.5 OTHER GUIDELINES AND BEST PRACTICE RECOMMENDATIONS 81
4.6 ADDITIONAL PERMITS AND AUTHORISATIONS 82

5 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS 83

5.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES 83
5.2 ENVIRONMENTAL AWARENESS PLAN 86
5.3 MONITORING 90
5.4 NON-CONFORMANCE AND CORRECTIVE ACTION 90
5.5 DOCUMENTATION AND REPORTING 92
5.6 METHOD STATEMENTS 93
5.7 PUBLIC COMPLAINTS 93
5.8 ADAPTIVE MANAGEMENT 94

6 GENERIC ENVIRONMENTAL CONTROLS 95

7 SITE SPECIFIC ENVIRONMENTAL CONTROLS 98

7.1 CONTRACTOR LAYDOWN AREA AND SITE ACCESS 99
7.2 VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT 101
7.3 FUEL AND CHEMICAL MANAGEMENT 102
7.4 WASTE MANAGEMENT 104
7.5 HEALTH AND SAFETY 107
7.6 AIR QUALITY 111
7.7 NOISE 113
7.8 SOIL, LAND USE AND AGRICULUTURE 115
7.9 AQUATIC BIODIVERSITY 116
7.10 TERRESTRIAL BIODIVERSITY 133
7.11 PLANT SPECIES 143
7.12 ANIMAL SPECIES 148
7.13 AVIFAUNA 152
7.14 ARCHAEOLOGICAL AND CULTURAL HERITAGE 158
7.15 TRAFFIC 160

7.16 VISUAL 162
7.17 SOCIO-ECONOMIC 166
7.18 BATS 174
7.19 GEOTECHNICAL 178
7.20 RISK ASSESSMENT 181

8 MANAGEMENT PLANS 200

8.1 EMERGENCY RESPONSE PLAN 200
8.2 WASTE MANAGEMENT PLAN 202
8.3 HAZARDOUS SUBSTANCES MANAGEMENT PLAN 204
8.4 FIRE MANAGEMENT PLAN 208
8.5 ALIEN INVASIVE PLANT MANAGEMENT PLAN 208
8.6 PLANT RESCUE AND PROTECTION PLAN 212
8.7 RE-VEGETATION AND HABITAT REHABILITATION PLAN 214
8.8 STORMWATER MANAGEMENT PLAN 217
8.9 EROSION MANAGEMENT PLAN 217
8.10 TRAFFIC AND TRANSPORT MANAGEMENT PLAN 219
8.11 FAUNA MANAGEMENT PLAN 220
8.12 AVIFAUNAL MANAGEMENT PLAN 222
8.13 SOIL MANAGEMENT PLAN 225
8.14 HERITAGE MANAGEMENT PLAN 227
8.15 GRIEVANCE MECHANISM 228
8.16 HIV/AIDS MANAGEMENT PLAN 232
8.17 SECURITY POLICY 233

9 CONCLUSION 235

TABLES

Table 1-1 - Proposed key components of the project 2
Table 1-2 - Details of the Environmental Assessment Practitioner 4

Table 1-3 – Legislation Requirements as detailed in Appendix 4 of GNR 326 6
Table 2-1 - Phefumula Emoyeni One WEF Affected Farm Portions 9
Table 2-2 - Co-ordinate Points of the Cadastral Land Parcels 14
Table 2-3 – Proposed project infrastructure 20
Table 2-4 - Construction activities 23
Table 3-1 - Assessment Protocols and Site Sensitivity Verification Summary 30
Table 3-2 - Response to Recommendations received 34
Table 3-3 - Mapping criteria utilised by the specialists for the assessment 36
Table 3-4 – Impact Summary 39
Table 4-1: Applicable National Legislation 49
Table 4-2: Applicable Regional Policies and Plans 63
Table 4-3: Provincial and Municipal Plans 67
Table 4-4: IFC Performance Standards Applicability to the Project 71
Table 4-5: Requirements and Applicability of the Equator Principles 78
Table 4-6 – Additional Permits and Authorisations required for the proposed development 82
Table 5-1 – Roles and Responsibilities 83
Table 5-2 - Documentation Reporting and Compliance Requirements as per the generic EMPr 89
Table 6-1 – Format of a general environmental control illustrating aspects which are predefined versus those which still need to be completed by the contractor 95
Table 6-2 - Activities and management measures as per generic EMPr (Part B: Section 1) 96
Table 7-1 – Structure of EMPr 98
Table 7-2 – Contractor laydown area and site access: EMPr Mitigation and Management Measures 99
Table 7-3 – Vehicle, Equipment and Machinery Management: EMPr Mitigation and Management Measures 101
Table 7-4 – Fuel and Chemical Management: EMPr Mitigation and Management Measures 102
Table 7-5 – Waste Management: EMPr Mitigation and Management Measures 104
Table 7-6 – Health and Safety: EMPr Mitigation and Management Measures 107
Table 7-7 – Air quality: EMPr Mitigation and Management Measures 111
Table 7-8 – Noise: EMPr Mitigation and Management Measures 113

Table 7-9 – Soil, Land Use and Agriculture: EMPr Mitigation and Management Measures 115
Table 7-10 – Aquatic Biodiversity: EMPr Mitigation and Management Measures 116
Table 7-11 – Terrestrial Biodiversity: EMPr Mitigation and Management Measures 133
Table 7-12 – Plant Species: EMPr Mitigation and Management Measures 143
Table 7-13 – Animal Species: EMPr Mitigation and Management Measures 148
Table 7-14 – Avifauna: EMPr Mitigation and Management Measures 152
Table 7-15 – Archaeological and Cultural Heritage: EMPr Mitigation and Management Measures 158
Table 7-16 – Traffic: EMPr Mitigation and Management Measures 160
Table 7-17 – Visual: EMPr Mitigation and Management Measures 162
Table 7-18 – Socio-Economic: EMPr Mitigation and Management Measures 166
Table 7-19 – Bats: EMPr Mitigation and Management Measures 174
Table 7-20 – Geotechnical: EMPr Mitigation and Management Measures 178
Table 7-21 - Risk Assessment EMPr Mitigation and Management Measures 181
Table 8-1 - Waste Management Options 204

FIGURES

Figure 1-1 – Phefumula Emoyeni One WEF Locality Map (illustrating the assessment area)4
Figure 2-1 - Refined Layout 22
Figure 2-2 - Load shedding hours over the years in South Africa 27
Figure 2-3: 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) 28
Figure 3-1 – Consolidated site sensitivity map overlain on the Refined Layout Map 38
Figure 8-1: Waste Hierarchy 203

APPENDICES

APPENDIX A
EAP CV

APPENDIX B

EAP DECLARATION

APPENDIX C

MAPS

APPENDIX D

PROJECT INFRASTRUCTURE CO-ORDINATES

APPENDIX E

GENERIC EMPR - SUBSTATIONS

APPENDIX F

GRAVE MANAGEMENT PLAN

APPENDIX G

SHUT DOWN ON DEMAND PROTOCOL

APPENDIX H

SECRETARYBIRD PROTOCOL

APPENDIX I

AVIFAUNA MANAGEMENT PLAN

GLOSSARY

Abbreviation	Definition
AC	Alternating Current
AEL	Atmospheric Emissions License
AIS	Alien and Invasive Species
ATNS	Air Traffic and Navigation Services
BESS	Battery Energy Storage System
BMS	Battery Management System
CA	Competent Authority
CAA	Civil Aviation Authority
CARA	Conservation of Agricultural Resources Act (No. 43 of 1983)
CBA	Critical Biodiversity Area
CHSSP	Community Health, Safety and Security Plan
CCIA	Climate Change Impact Assessment
CSP	Concentrated Solar Power
DALRRD	Department of Agriculture Land Reform and Rural Development
DC	Direct Current
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DR	District Roads
DSR	Draft Scoping Report
DWS	Department of Water & Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act 73 of 1989
ECO	Environmental Control Officer

Abbreviation	Definition
EHS	Environmental Health and Safety
EI&ES	Ecological Importance and Ecological Sensitivity
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
EP	Equator Principles
EPFI	Equator Principles Financial Institutions
ERA	Electricity Regulation Act (No. 4 of 2006)
ESA	Ecological Support Area
FI	Financial Institutions
GA	General Authorisation
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GNR	Government Notice Regulation
GSDM	Gert Sibande District Municipality
ha	Hectares
HIA	Heritage Impact Assessment
IBA	Important Bird & Biodiversity Area
ICAO	International Civil Aviation Organisation
IEP	National Integrated Energy Plan
IFC	International Finance Corporation
IRP	Integrated Resource Plan
MLM	Msukaligwa Local Municipality
LUPA	Land Use Planning Act (Act 3 of 2014)
MW	Megawatt
NDP	National Development Plan
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act 39 of 2004

Abbreviation	Definition
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management Protected Areas Act (No. 57 of 2003)
NHRA	National Heritage Resource Act (Act No. 25 of 1999)
NID	Notification of Intent to Develop
NPAES	National Protected Area Expansion Strategy 2010
NR	National Routes
NWA	National Water Act, 1998 (Act No. 36 of 1998)
O&M	Operations and Maintenance
OHSA	Occupational Health and Safety Act (No. 85 of 1993)
PCS	Power Conditioning System
PICC	Presidential Infrastructure Coordinating Commission
PPP	Public Participation Process
PS	Performance Standards
PV	Photovoltaic
REC	Recommended Ecological Condition
REDZ	Renewable Energy Development Zones
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RFI	Radio Frequency Interference
S&EIA	Scoping and Environmental Impact Assessment
SABS	South African Bureau of Standards
SACAA	South African Civil Aviation Authority
SAHRA	South African Heritage Resources Agency
SAHRA	South African Heritage Resources Agency
SALA	Subdivision of Agricultural Land Act
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency
SANS	South African National Standards

Abbreviation	Definition
SARPs	Standards and Recommended Practices
SAWS	South African Weather Service
SDF	Spatial Development Frameworks
SDG	Sustainable Development Goals
SEP	Stakeholder Engagement Plan
SER	Stakeholder Engagement Report
SG	Surveyor General
SKA	Square Kilometre Array
TOPs	Threatened or Protected Species
UNDP	United Nations' Development Programmes
WBG	World Bank Group
WEF	Wind Energy Facility
WSP	WSP Group Africa (Pty) Ltd
WUA	Water Use Authorisation
WUL	Water Use License

1 INTRODUCTION

WSP Group Africa (Pty) Ltd (WSP) has been appointed by Phefumula Emoyeni One (Pty) Ltd (Phefumula) (a private special purpose company to be incorporated), to undertake an Environmental Impact Assessment (EIA) to meet the requirements under the National Environmental Management Act (Act 107 of 1998) (NEMA), for the proposed Phefumula Emoyeni One Wind Energy Facility (WEF) and its associated infrastructure, located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa. (**Figure 1-1**).

The proposed development is subject to a Scoping and EIA (S&EIA) Process in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA) (as amended) and Appendix 2 and 3 of the EIA Regulations, 2014 promulgated in Government Gazette 40772 and GN R326, R327, R325 and R324 on 7 April 2017. The competent authority for this S&EIA Process is the national Department of Forestry, Fisheries and Environment (DFFE).

An application for Environmental Authorisation (EA) in terms of the National Environmental Management Act, Act 107 of 1998 (NEMA) and associated Environmental Impact Assessment (EIA) Regulations, 2014, as amended, was submitted on 15 April 2024 to the Department of Forestry, Fisheries and Environment (DFFE) (Reference: 14/12/16/3/3/2/2545). During the course of the public participation process, undertaken for the Draft Environmental Impact Assessment (EIA) Report, various concerns and objections were raised by various registered Interested and Affected Parties (I&APs) with regards to the sensitivity of the biodiversity in the area, particularly the high avifaunal sensitivity. These comments included the request for additional studies. In light of the comments noted above, a decision was made to allow the previous application to lapse such that additional investigations could be undertaken.

WSP Group Africa (Pty) Ltd (WSP) is applying for the re-submission of application for EA for the proposed project in terms of Regulation 21(2) of GNR 326. The Approval of the Scoping Report was received on 17 July 2024 and is still valid.

All registered Interested and Affected Parties (I&APs) were informed of WSP's intent to re-submit the application for EA for the proposed project in terms of Regulation 21(2) of GNR 326 via email on 29 October 2024. A new DFFE reference number will be provided for this re-submission.

1.1 BACKGROUND INFORMATION

The proponent is proposing the development of the Phefumula Emoyeni One WEF in Mpumalanga. The facility consists of the following distinct projects referred to as:

- Phefumula Emoyeni One WEF (up to 550MW) (DFFE Ref: 14/12/16/3/3/2/2696); and
- Up to 400kV Grid Connection and Main Transmission Substation (MTS) (DFFE Ref: 14/12/16/3/3/2/2596).

The focus of this Draft Environmental Management programme is the proposed Phefumula Emoyeni One WEF (up to 550MW) 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. 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)).

The proposed project will comprise the following key components (**Table 1-1**)

Table 1-1 - Proposed key components of the project

Technical details of the proposed Phefumula Emoyeni One Wind Energy Facility	
Location of the Site	Approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province
Farm Portions	The WEF will be located over 95 farm portions
Central coordinates of the site and activity location	26°21'31.02"S; 29°46'49.38"E
Total Site Extent	Approximately 33 660ha
Design Specifications	
Capacity	Up to 550MW
Number of Turbines	Up to 72 turbines (Between 6MW and 15MW each)
Turbine Hub Height	Up to 200m
Rotor Diameter	Up to 200m
Tip Height	Up to 300m
Permanent hard standing area	Approximately 75m x 120m
Foundation	Each turbine will have a foundation of approximately up to 40m^2 – excavation up to 6m deep, constructed of reinforced concrete to support the mounting ring. Once tower established, footprint of foundation is covered with soil.
Three IPP Portion Onsite Substations and Battery Energy Storage System (BESS)	▪ Each IPP onsite Substation and BESS will have a total footprint of up to 10ha in extent. ▪ Each 33kV/132kV onsite collector substation (IPP portion) will have a footprint of approximately 5ha. • The substation will consist of a high voltage substation yard to allow for multiple up to 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc. ▪ Each BESS will have a footprint of approximately 5 ha • Export Capacity of up to 200MWh • Total storage capacity 800MW • Storage capacity of up to 6-8 hours • The BESS will be housed in containers • Battery types to be considered: Solid State Batteries as the preferred (Lithium Ion) and Redox Flow Batteries as the alternative (Vanadium Redox).

Operation and Maintenance (O&M) Building Infrastructure	O&M building infrastructure will be required to support the functioning of the WEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the onsite substation and will include 3 O&M offices of approximately 1.5ha each adjacent to each collector Substation. Each O&M Building will include: ▪ Operations Building; ▪ Workshop and Stores Area ▪ Refuse area for temporary storage of waste; and ▪ Conservancy tank to service the ablution facilities.
Three Construction Camp Laydown Areas	Each Construction Camp Laydown Area will include: ▪ Temporary laydown or staging area -Typical area 3ha each (150m x 20. ▪ Laydown area could increase to 30ha for concrete towers, should they be required. ▪ Sewage: septic and/or conservancy tanks and portable toilets. ▪ Temporary concrete batching plant & yard of approximately 7ha, comprising amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. The maximum height of the silo will be 20m.
Access Roads	▪ The Project site can be accessed easily via the N11 national road which runs along the eastern boundaries of the site. ▪ There are existing roads that go through the land parcels to allow for direct access to the project development area. ▪ Internal and access roads with a width of between 8m and 10m, which can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. Length of the internal roads will be approximately 60km.
Associated Infrastructure	▪ 33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical. ▪ Cabling between turbines, to be laid underground where practical. ▪ Laydown and crane hardstand areas (approximately 75m x 120m).

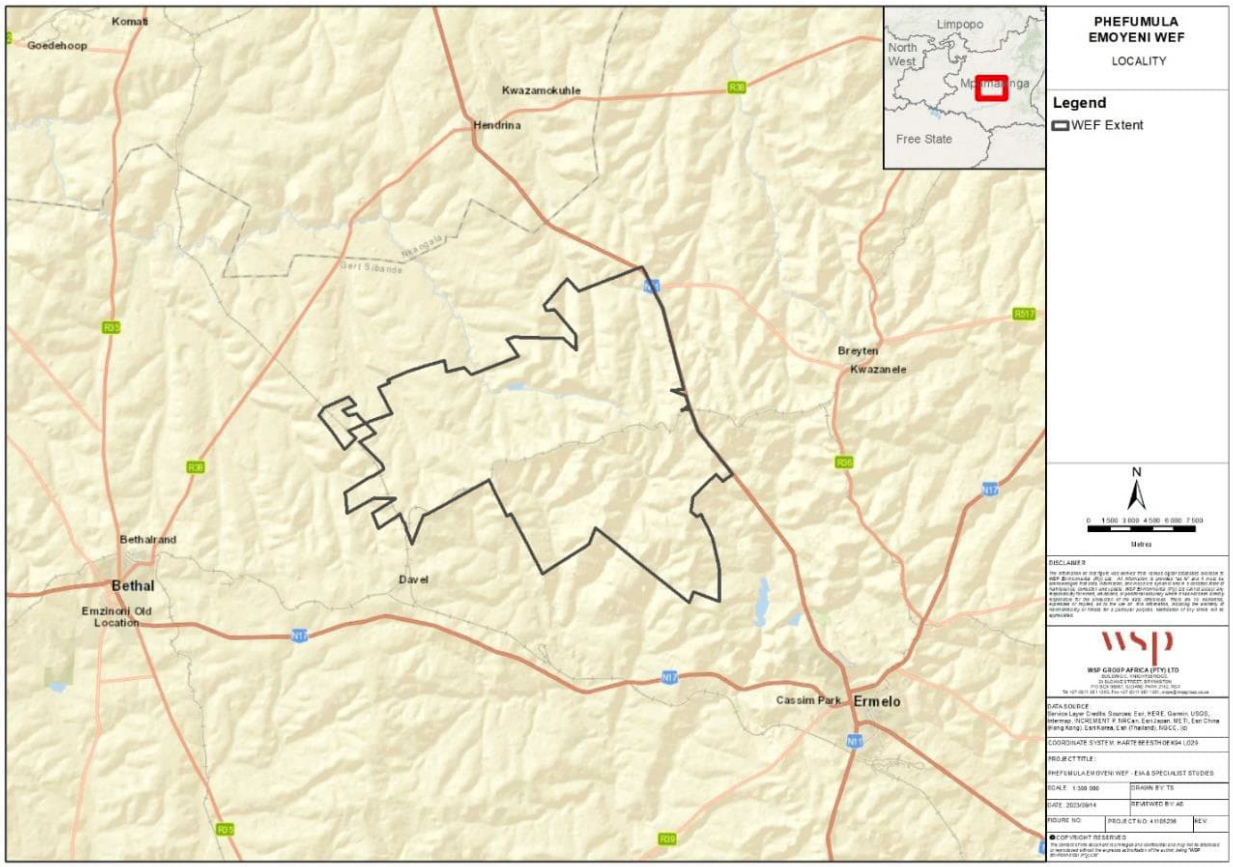


Figure 1-1 – Phefumula Emoyeni One WEF Locality Map (illustrating the assessment area)

1.2 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 1-2** 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 1-2 - 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)

1.3 PURPOSE OF THE EMPR

An EMPr is defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented or mitigated, and that the positive benefits of the projects are enhanced."

This EMPr has been compiled in accordance with Appendix 4 of GNR 982, in compliance with section 24N of NEMA, with the purpose of ensuring that negative impacts are reduced, and positive effects are enhanced through a process of continual improvement, during the construction, operational and decommissioning phases for the Phefumula Emoyeni One WEF.

To facilitate compliance to the EMPr by appointed contractors and sub-contractors, it is required that all onsite personnel are aware of the requirements of the EMPr as well as the prescribed penalties should a non-conformance be identified during the construction, operation and decommissioning activities.

Further to the above, appointed contractors and sub-contractors will also be required to comply with all relevant legislation and standards.

A hard copy of the EMPr must always be in the site office and made available to officials at request.

1.3.1 EMPR OBJECTIVES

The EMPr has the following objectives:

- Identify mitigation measures and environmental specifications which are required to be implemented for the planning, construction and rehabilitation, operation, and decommissioning phases of the project in order to manage and minimise the extent of potential environmental impacts associated with the facility;
- Ensure that all the phases of the proposed project do not result in undue or reasonably avoidable adverse environmental impacts, and ensure that any potential environmental benefits are enhanced;
- Identify entities responsible for the implementation of the measures and outline functions and responsibilities;
- Create management structures that address the concerns and complaints of interested and affected parties (I&APs) with regards to the proposed project;
- Propose mechanisms and frequency for monitoring compliance, and preventing long-term or permanent environmental degradation; Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Train onsite personnel with regard to their environmental obligations; and
- Facilitate appropriate and proactive responses to unforeseen events or changes in project implementation that was not considered in the S&EIA process.

1.3.2 ENVIRONMENTAL OBJECTIVES AND TARGETS

To facilitate compliance to the EMPr, Phefumula Emoyeni One WEF must comply with all relevant legislation and standards and make all personnel aware of the requirements of the EMPr, as well as the prescribed penalties should a non-conformance be identified during the different phases of the proposed Project.

It is recommended that environmental objectives (as outlined in this document) be emphasised as minimum requirements. Objectives include:

- Encourage good management practices through planning and commitment to environmental issues; and
- Provide rational and practical environmental guidelines to:
- Minimise disturbance of the natural environment;
- Minimise fugitive emissions;
- Minimise impact of added traffic into the area;
- Ensure surface and groundwater resource protection;
- Prevent or minimise all forms of pollution;
- Protect indigenous flora and fauna;
- Prevent soil erosion;
- Promote sustainable use of resources;
- Adopt the best practical means available to prevent or minimise adverse environmental impacts;
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment;
- Promote the reduction, reuse, recycling and recovery of waste;
- Develop waste management practices based on prevention, minimisation, recycling, treatment or disposal of waste;
- Describe all monitoring procedures required to identify impacts on the environment;
- Define how the management of the environment is reported and performance evaluated; and
- Train onsite personnel with regard to their environmental obligations.

1.4 STRUCTURE OF THE EMPR

For the purposes of demonstrating legal compliance, **Table 1-3** cross-references the sections within the EMPr with the requirements as per Appendix 4 of GNR 326 of 2017.

Table 1-3 – Legislation Requirements as detailed in Appendix 4 of GNR 326

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
(a)	details of-	
	(i) the EAP who prepared the EMPr; and	**Section 1.2**
	(ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	**Section 1.2** **Appendix A**
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	**Section 2**

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
(c)	a map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;	**Section 3** **Appendix C**
(d)	A description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-	**Section 3.2 and** **Section** 6
	(i) planning and design;	
	(ii) pre-construction activities;	
	(iii) construction activities;	
	(iv) rehabilitation of the environment after construction and where applicable post closure; and	
	(v) where relevant, operation activities;	
(f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to -	**Section** 6
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	
	(ii) comply with any prescribed environmental management standards or practices;	
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable	
(g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**Section** 5
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	**Section** 5
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	**Section** 5 **Section** 6
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	**Section** 6
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	**Section** 5

Appendix 4	Legislated Requirements as detailed in Appendix 4 of GNR 326	Relevant Report Section
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations	**Section** 5 **Section** 6
(m)	an environmental awareness plan describing the manner in which-	**Section** 5.2
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	
(n)	any specific information that may be required by the competent authority	N/A

2 PROJECT DESCRIPTION

This section provides a description of the location of the project site location and a summary of the project details. The descriptions encompass the activities to be done during the construction, operational and decommissioning (should it be decided that the facility will be decommissioned) phases, as well as the consideration for the needs and desirability of the project in accordance with Appendix 1 of GNR 326.

2.1 LOCATION OF THE PROPOSED PROJECT

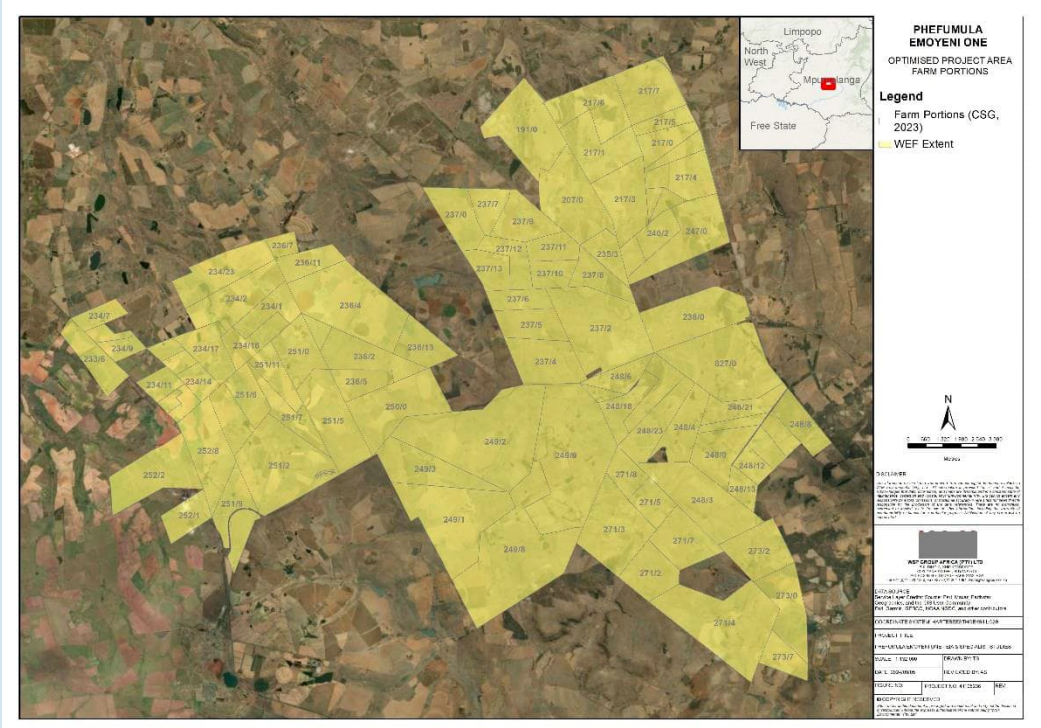
The proposed Phefumula Emoyeni One WEF will have a project area of approximately 33 660 hectares (ha). Within this project area the extent of the buildable area will be subject to finalization based on technical and environmental requirements.

The proposed Phefumula Emoyeni One WEF is located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa.

The details of the property associated with the proposed Phefumula Emoyeni One WEF, including the 21-digit Surveyor General (SG) codes for the cadastral land parcels are outlined in **Table 2-1**. There are 93 affected farm portions.

The co-ordinates of the cadastral land parcels are included in **Table 2-2.**

Table 2-1 - Phefumula Emoyeni One WEF Affected Farm Portions

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
			
T0IS00000000019100000	GROBLESHOEK 191 IS	191	0

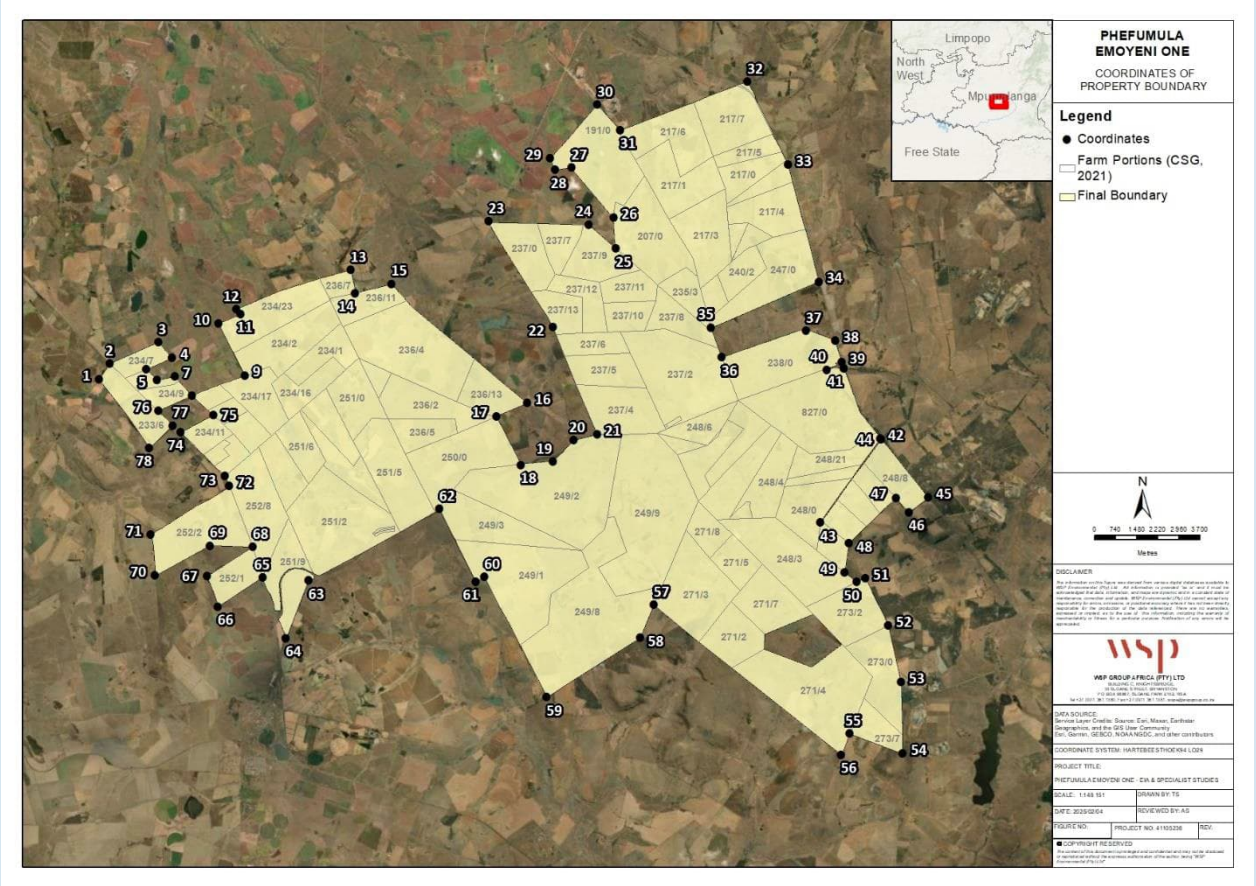
21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000020700000	ISRAEL 207 IS	207	0
T0IS00000000021700000	BOSMANSKRANS 217 IS	217	0
T0IS00000000021700001	BOSMANSKRANS 217 IS	217	1
T0IS00000000021700003	BOSMANSKRANS 217 IS	217	3
T0IS00000000021700004	BOSMANSKRANS 217 IS	217	4
T0IS00000000021700005	BOSMANSKRANS 217 IS	217	5
T0IS00000000021700006	BOSMANSKRANS 217 IS	217	6
T0IS00000000021700007	BOSMANSKRANS 217 IS	217	7
T0IS00000000021700008	BOSMANSKRANS 217 IS	217	8
T0IS00000000021700009	BOSMANSKRANS 217 IS	217	9
T0IS00000000021700013	BOSMANSKRANS 217 IS	217	13
T0IS00000000021700014	BOSMANSKRANS 217 IS	217	14
T0IS00000000023300006	VAALBANK 233 IS	233	6
T0IS00000000023400001	KUILFONTEIN No. 234-IS	234	1
T0IS00000000023400002	KUILFONTEIN No. 234-IS	234	2
T0IS00000000023400007	KUILFONTEIN No. 234-IS	234	7
T0IS00000000023400008	KUILFONTEIN No. 234-IS	234	8
T0IS00000000023400009	KUILFONTEIN No. 234-IS	234	9
T0IS00000000023400011	KUILFONTEIN No. 234-IS	234	11
T0IS00000000023400012	KUILFONTEIN No. 234-IS	234	12
T0IS00000000023400014	KUILFONTEIN No. 234-IS	234	14
T0IS00000000023400015	KUILFONTEIN No. 234-IS	234	15
T0IS00000000023400016	KUILFONTEIN No. 234-IS	234	16
T0IS00000000023400017	KUILFONTEIN No. 234-IS	234	17
T0IS00000000023400021	KUILFONTEIN No. 234-IS	234	21
T0IS00000000023400022	KUILFONTEIN No. 234-IS	234	22
T0IS00000000023400023	KUILFONTEIN No. 234-IS	234	23
T0IS00000000023500003	BOSMANSHOEK NO. 235 - IS	235	3
T0IS00000000023600002	WITBANK NO. 236 - IS	236	2

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000023600004	WITBANK NO. 236 - IS	236	4
T0IS00000000023600005	WITBANK NO. 236 - IS	236	5
T0IS00000000023600007	WITBANK NO. 236 - IS	236	7
T0IS00000000023600010	WITBANK NO. 236 - IS	236	10
T0IS00000000023600011	WITBANK NO. 236 - IS	236	11
T0IS00000000023600013	WITBANK NO. 236 - IS	236	13
T0IS00000000023700000	NOOITGEDACHT 237 IS	237	0
T0IS00000000023700002	NOOITGEDACHT 237 IS	237	2
T0IS00000000023700004	NOOITGEDACHT 237 IS	237	4
T0IS00000000023700005	NOOITGEDACHT 237 IS	237	5
T0IS00000000023700006	NOOITGEDACHT 237 IS	237	6
T0IS00000000023700007	NOOITGEDACHT 237 IS	237	7
T0IS00000000023700008	NOOITGEDACHT 237 IS	237	8
T0IS00000000023700009	NOOITGEDACHT 237 IS	237	9
T0IS00000000023700010	NOOITGEDACHT 237 IS	237	10
T0IS00000000023700011	NOOITGEDACHT 237 IS	237	11
T0IS00000000023700012	NOOITGEDACHT 237 IS	237	12
T0IS00000000023700013	NOOITGEDACHT 237 IS	237	13
T0IS00000000023800000	ORPENSKRAAL 238 IS	238	0
T0IS00000000023800002	ORPENSKRAAL 238 IS	238	2
T0IS00000000023800009	ORPENSKRAAL 238 IS	238	9
T0IS00000000023800010	ORPENSKRAAL 238 IS	238	10
T0IS00000000023800011	ORPENSKRAAL 238 IS	238	11
T0IS00000000024000001	GELIKSDRAAI No. 240 -IS	240	1
T0IS00000000024000002	GELIKSDRAAI No. 240 -IS	240	2
T0IS00000000024700000	ELIM No. 247- IS	247	0
T0IS00000000024800000	KRANSPOORT 248 IS	248	0
T0IS00000000024800002	KRANSPOORT 248 IS	248	2
T0IS00000000024800003	KRANSPOORT 248 IS	248	3

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000024800004	KRANSPOORT 248 IS	248	4
T0IS00000000024800006	KRANSPOORT 248 IS	248	6
T0IS00000000024800008	KRANSPOORT 248 IS	248	8
T0IS00000000024800010	KRANSPOORT 248 IS	248	10
T0IS00000000024800011	KRANSPOORT 248 IS	248	11
T0IS00000000024800012	KRANSPOORT 248 IS	248	12
T0IS00000000024800013	KRANSPOORT 248 IS	248	13
T0IS00000000024800018	KRANSPOORT 248 IS	248	18
T0IS00000000024800019	KRANSPOORT 248 IS	248	19
T0IS00000000024800021	KRANSPOORT 248 IS	248	21
T0IS00000000024800022	KRANSPOORT 248 IS	248	22
T0IS00000000024800023	KRANSPOORT 248 IS	248	23
T0IS00000000024900001	TWEEFONTEIN 249 IS	249	1
T0IS00000000024900002	TWEEFONTEIN 249 IS	249	2
T0IS00000000024900003	TWEEFONTEIN 249 IS	249	3
T0IS00000000024900008	TWEEFONTEIN 249 IS	249	8
T0IS00000000024900009	TWEEFONTEIN 249 IS	249	9
T0IS00000000025000000	VOORZORG 250 IS	250	0
T0IS00000000025100000	NOOITGEDACHT 251 IS	251	0
T0IS00000000025100002	NOOITGEDACHT 251 IS	251	2
T0IS00000000025100003	NOOITGEDACHT 251 IS	251	3
T0IS00000000025100005	NOOITGEDACHT 251 IS	251	5
T0IS00000000025100006	NOOITGEDACHT 251 IS	251	6
T0IS00000000025100007	NOOITGEDACHT 251 IS	251	7
T0IS00000000025100009	NOOITGEDACHT 251 IS	251	9
T0IS00000000025100010	NOOITGEDACHT 251 IS	251	10
T0IS00000000025100011	NOOITGEDACHT 251 IS	251	11
T0IS00000000025100013	NOOITGEDACHT 251 IS	251	13
T0IS00000000025200001	SPION KOP 252 IS	252	1

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000025200002	SPION KOP 252 IS	252	2
T0IS00000000025200008	SPION KOP 252 IS	252	8
T0IS00000000027100002	MIDDELPLAAT 271 IS	271	2
T0IS00000000027100003	MIDDELPLAAT 271 IS	271	3
T0IS00000000027100004	MIDDELPLAAT 271 IS	271	4
T0IS00000000027100005	MIDDELPLAAT 271 IS	271	5
T0IS00000000027100007	MIDDELPLAAT 271 IS	271	7
T0IS00000000027100008	MIDDELPLAAT 271 IS	271	8
T0IS00000000027300000	DRIEHOEK No. 273- IS	273	0
T0IS00000000027300002	DRIEHOEK No. 273- IS	273	2
T0IS00000000027300007	DRIEHOEK No. 273- IS	273	7
T0IS00000000082700000	KRANSPOORT 827 IS	827	0

Table 2-2 - Co-ordinate Points of the Cadastral Land Parcels

Point	Longitude	Latitude
		
1	29° 36' 30.930" E	26° 20' 28.224" S
2	29° 36' 44.472" E	26° 20' 10.448" S
3	29° 37' 46.471" E	26° 19' 45.909" S
4	29° 38' 3.823" E	26° 20' 3.789" S
5	29° 37' 31.069" E	26° 20' 16.497" S
6	29° 37' 45.379" E	26° 20' 29.083" S
7	29° 38' 6.762" E	26° 20' 24.455" S
8	29° 38' 28.935" E	26° 20' 46.667" S
9	29° 39' 35.851" E	26° 20' 23.104" S
10	29° 39' 2.349" E	26° 19' 24.172" S
11	29° 39' 30.331" E	26° 19' 13.221" S
12	29° 39' 24.879" E	26° 19' 7.371" S

Point	Longitude	Latitude
13	29° 41' 49.073" E	26° 18' 22.296" S
14	29° 41' 55.046" E	26° 18' 48.250" S
15	29° 42' 40.257" E	26° 18' 37.896" S
16	29° 45' 33.046" E	26° 20' 52.865" S
17	29° 44' 54.243" E	26° 21' 7.983" S
18	29° 45' 25.343" E	26° 22' 2.001" S
19	29° 46' 7.039" E	26° 21' 58.806" S
20	29° 46' 32.568" E	26° 21' 34.662" S
21	29° 47' 1.791" E	26° 21' 28.271" S
22	29° 45' 59.499" E	26° 19' 16.707" S
23	29° 44' 42.966" E	26° 17' 27.466" S
24	29° 46' 49.828" E	26° 17' 28.979" S
25	29° 47' 24.374" E	26° 17' 56.190" S
26	29° 47' 20.597" E	26° 17' 20.836" S
27	29° 46' 26.928" E	26° 16' 24.019" S
28	29° 46' 6.342" E	26° 16' 26.992" S
29	29° 46' 0.629" E	26° 16' 13.630" S
30	29° 47' 0.006" E	26° 15' 12.702" S
31	29° 47' 28.358" E	26° 15' 41.821" S
32	29° 50' 9.465" E	26° 14' 45.019" S
33	29° 51' 1.101" E	26° 16' 19.232" S
34	29° 51' 41.481" E	26° 18' 32.079" S
35	29° 49' 24.794" E	26° 19' 25.488" S
36	29° 49' 38.726" E	26° 19' 59.422" S
37	29° 51' 25.695" E	26° 19' 26.687" S
38	29° 52' 1.753" E	26° 19' 39.007" S
39	29° 52' 10.082" E	26° 20' 3.247" S

Point	Longitude	Latitude
40	29° 51' 52.240" E	26° 20' 12.739" S
41	29° 52' 13.833" E	26° 20' 11.067" S
42	29° 52' 34.683" E	26° 21' 0.688" S
43	29° 53' 0.004" E	26° 21' 29.222" S
44	29° 51' 45.184" E	26° 23' 6.916" S
45	29° 53' 2.657" E	26° 21' 32.064" S
46	29° 54' 1.835" E	26° 22' 37.299" S
47	29° 53' 36.860" E	26° 22' 54.353" S
48	29° 53' 20.476" E	26° 22' 38.115" S
49	29° 52' 21.367" E	26° 23' 29.733" S
50	29° 52' 16.238" E	26° 24' 3.466" S
51	29° 52' 31.496" E	26° 24' 14.361" S
52	29° 52' 42.241" E	26° 24' 9.680" S
53	29° 53' 12.166" E	26° 25' 3.531" S
54	29° 53' 29.174" E	26° 26' 8.395" S
55	29° 53' 31.006" E	26° 27' 28.948" S
56	29° 52' 24.249" E	26° 27' 7.059" S
57	29° 52' 14.037" E	26° 27' 31.302" S
58	29° 48' 15.264" E	26° 24' 41.763" S
59	29° 47' 58.070" E	26° 25' 19.155" S
60	29° 46' 0.518" E	26° 26' 27.595" S
61	29° 44' 39.802" E	26° 24' 10.765" S
62	29° 44' 29.440" E	26° 24' 16.388" S
63	29° 43' 37.579" E	26° 22' 56.701" S
64	29° 40' 57.639" E	26° 24' 16.511" S
65	29° 40' 29.515" E	26° 25' 21.761" S
66	29° 39' 58.933" E	26° 24' 12.927" S

Point	Longitude	Latitude
67	29° 39' 3.340" E	26° 24' 46.143" S
68	29° 38' 48.955" E	26° 24' 11.894" S
69	29° 39' 47.034" E	26° 23' 38.499" S
70	29° 38' 52.712" E	26° 23' 36.802" S
71	29° 37' 43.688" E	26° 24' 11.647" S
72	29° 37' 38.025" E	26° 23' 24.553" S
73	29° 39' 16.809" E	26° 22' 29.455" S
74	29° 39' 11.262" E	26° 22' 17.876" S
75	29° 38' 14.737" E	26° 21' 28.219" S
76	29° 38' 55.632" E	26° 21' 8.035" S
77	29° 37' 45.715" E	26° 21' 3.818" S
78	29° 38' 5.524" E	26° 21' 20.218" S
79	29° 37' 35.628" E	26° 21' 46.305" S
81	29° 51' 36.661" E	26° 24' 51.036" S
82	29° 50' 35.818" E	26° 25' 14.473" S
83	29° 50' 34.950" E	26° 25' 31.517" S
84	29° 51' 35.723" E	26° 25' 51.471" S
85	29° 52' 13.204" E	26° 25' 25.229" S
86	29° 41' 10.891" E	26° 24' 10.756" S
87	29° 40' 40.310" E	26° 24' 1.416" S
88	29° 40' 20.845" E	26° 24' 18.924" S
89	29° 40' 22.710" E	26° 24' 50.902" S
90	29° 40' 15.543" E	26° 24' 50.310" S
91	29° 40' 20.116" E	26° 25' 0.608" S
92	29° 40' 25.057" E	26° 24' 51.237" S
93	29° 40' 28.526" E	26° 24' 8.262" S
94	29° 40' 54.270" E	26° 24' 4.425" S

Point	Longitude	Latitude
95	29° 41' 5.168" E	26° 24' 13.183" S

2.2 ACTIVITY DESCRIPTION

The following are proposed as part of the project. The total project area is 33 660 ha. The project footprint will contain the following:

2.2.1 WIND TURBINES

- Up to 72 turbines (Between 6MW and 15MW each), Each turbine will have a foundation of approximately up to 40m^2 – excavation up to 6m deep, constructed of reinforced concrete to support the mounting ring. Once tower established, footprint of foundation is covered with soil;
- Turbine hub height of up to 200m;
- Rotor diameter up to 200m; and
- Permanent hard standing area for each wind turbine (approximately 75m x120m).

2.2.2 IPP ONSITE SUBSTATION AND BESS

- Each IPP onsite Substation and BESS will have a total footprint of up to 10ha in extent.
- Each 33kV/132kV onsite collector substation (IPP portion) will have a footprint of approximately 5ha.
- The substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc.
- Each BESS will have a footprint of approximately 5ha
- Export Capacity of up to 200MWh
- Total storage capacity 800MW
- Storage capacity of up to 6-8 hours
- The BESS will be housed in containers.
- Battery types to be considered: Solid State Batteries as the preferred (Lithium Ion) and Redox Flow Batteries as the alternative (Vanadium Redox).

2.2.3 OPERATION AND MAINTENANCE BUILDING INFRASTRUCTURE

- O&M building infrastructure will be required to support the functioning of the WEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the onsite substation and will include 3 O&M offices of approximately 1.5ha each adjacent to each collector Substation.
- Each O&M Building will include:
  - Operations Building;
  - Workshop and Stores Area
  - Refuse area for temporary storage of waste; and
  - Conservancy tank to service the ablution facilities.

2.2.4 CONSTRUCTION CAMP LAYDOWN

- Each Construction Camp Laydown Area will include:
- Temporary laydown or staging area -Typical area of 3ha each (150m x 200m).
- Laydown area could increase to 30ha for concrete towers, should they be required.

- Sewage: septic and/or conservancy tanks and portable toilets.
- Temporary concrete batching plant & yard of approximately 7ha, comprising amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, , water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. The maximum height of the silo will be 20m.

2.2.5 INTERNAL ROAD

- The Project site can be accessed easily via the N11 national road which run along the eastern boundaries of the site.
- There are existing roads that go through the land parcels to allow for direct access to the project development area.
- Internal and access roads with a width of between 8m and 10m, which can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. Length of the internal roads will be approximately 60km.

2.2.6 ASSOCIATED INFRASTRUCTURE

- 33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical.
- Cabling between turbines, to be laid underground where practical.
- Laydown and crane hardstand areas (approximately 75m x 120m).

2.3 REFINED LAYOUT

The proposed Phefumula Emoyeni One WEF will be developed with a capacity of up to 550 megawatts (MW). The key components are outlined in **Table 2-3** and indicated in **Figure 2-1** below.

The refined layout illustrated in **Figure 2-2** assumes a rotor diameter of 182m. It is noted that it is realistic to assume that this rotor diameter is more accurate in terms of the type of turbine that will ultimately be used.

It must be noted that the EIA is requesting approval for a rotor diameter of up to 200m. It is understood that should a turbine with a 200m rotor diameter be identified as suitable at the time of the development of the WEF, nine turbines (WTG 9, 16, 19, 24, 25, 68, 75, 78, 80) will require reconsideration and possible micro-siting to ensure that the rotor sweep area does not intersect any high sensitivity bat areas.

The co-ordinates for the following infrastructure included in the Refined Layout are outlined in **Appendix D**:

- Property boundary;
- Turbine locations;
- Three IPP Substations and BESS; and
- Construction Cap and Laydown areas

Table 2-3 – Proposed project infrastructure

Technical details of the proposed Phefumula Emoyeni One Wind Energy Facility	
Farm Portions	The WEF will be located over 93 farm portions
Central coordinates of the site and activity location	26°21'31.02"S ; 29°46'49.38"E
Total Site Extent	Approximately 33 660ha
Design Specifications	
Capacity	Up to 550MW
Number of Turbines	Up to 72 turbines (Between 6MW and 15MW each)
Turbine Hub Height	Up to 200m
Rotor Diameter	Up to 200m
Tip Height	Up to 300m
Permanent hard standing area	Approximately 75m x 120m
Foundation	Each turbine will have a foundation of approximately up to 40m^2 – excavation up to 6m deep, constructed of reinforced concrete to support the mounting ring. Once tower established, footprint of foundation is covered with soil.
Three IPP Portion Onsite Substations and Battery Energy Storage System (BESS)	▪ Each IPP onsite Substation and BESS will have a total footprint of up to 10ha in extent. ▪ Each 33kV/132kV onsite collector substation (IPP portion) will have a footprint of approximately 5ha. • The substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc. ▪ Each BESS will have a footprint of approximately 5ha • Export Capacity of up to 200MW. • Total storage capacity 800MWh. • Storage capacity of up to 6-8 hours. • The BESS will be housed in containers. • Battery types to be considered: Solid State Batteries as the preferred (Lithium Ion) and Redox Flow Batteries as the alternative (Vanadium Redox).

Operation and Maintenance (O&M) Building Infrastructure	O&M building infrastructure will be required to support the functioning of the WEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the onsite substation and will include 3 O&M offices of approximately 1.5ha each adjacent to each collector Substation. Each O&M Building will include: ▪ Operations Building; ▪ Workshop and Stores Area ▪ Refuse area for temporary storage of waste; and ▪ Conservancy tank to service the ablution facilities.
Three Construction Camp Laydown Areas	Each Construction Camp Laydown Area will include: ▪ Temporary laydown or staging area -Typical area of 3ha each (150m x 200m). ▪ Laydown area could increase to 30ha for concrete towers, should they be required. ▪ Sewage: septic and/or conservancy tanks and portable toilets. ▪ Temporary concrete batching plant & yard of approximately 7ha, comprising amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, , water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. The maximum height of the silo will be 20m.
Access Roads	▪ The Project site can be accessed easily via the N11 national road which run along the eastern boundaries of the site. ▪ There are existing roads that go through the land parcels to allow for direct access to the project development area. ▪ Internal and access roads with a width of between 8m and 10m, which can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. Length of the internal roads will be approximately 60km.

Associated Infrastructure	33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical. Cabling between turbines, to be laid underground where practical. Laydown and crane hardstand areas (approximately 75m x 120m).

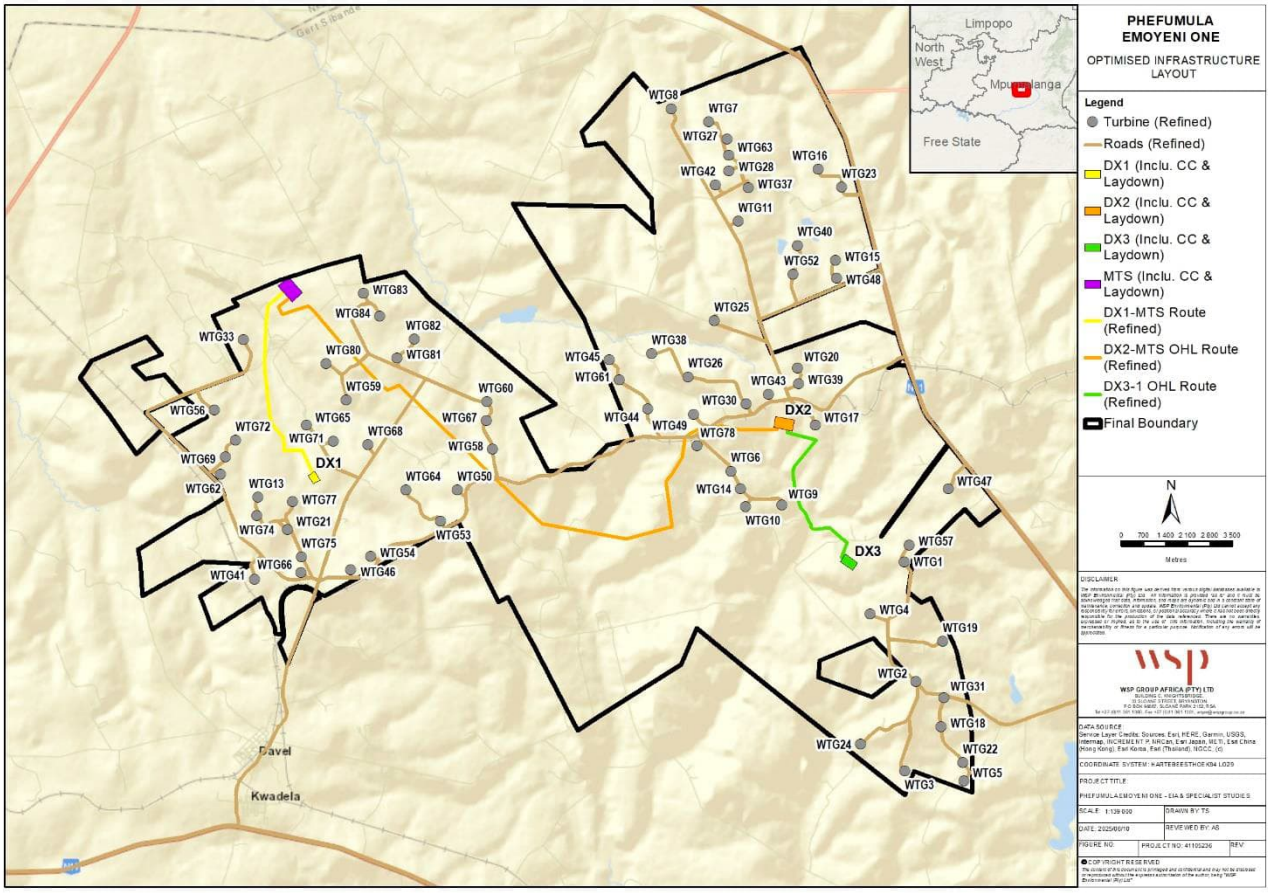


Figure 2-1 - Refined Layout

2.4 PROPOSED PROJECT DEVELOPMENT ACTIVITIES

The typical steps involved in the construction and operation of a wind energy facility is summarised below:

- Planning Phase
  - Step 1: Surveying of the development area and negotiation with affected landowners; and
  - Step 2: Detailed design phase, which includes determining the technology, designing the on-site substation and associated infrastructure, including a geotechnical survey.
- Construction Phase
  - Step 3: Vegetation clearing and construction of access roads/tracks (where required);
  - Step 4: Construction of turbine tower structure foundations;

- Step 5: Assembly and erection of infrastructure on site; and
- Step 6: Rehabilitation of disturbed areas and protection of erosion sensitive areas.

- Operation Phase
  - Step 7: Continued maintenance during operation.

2.4.1 PLANNING PHASE

Surveys will be conducted prior to construction, this will include, but will not be limited to, a geotechnical survey, site survey, and survey of the on-site substation site and all associated infrastructure. Following conclusion of the surveys, detailed design will be undertaken, which will include determining the technology, and designing the on-site substation and associated infrastructure.

Site establishment will include clearing of vegetation and topsoil at the footprint of each turbine, for laydown area, batching plant and access routes. The temporary laydown area will be constructed, including establishment of the construction camp (temporary offices, storage containers, concrete batching plant etc). Site establishment will also entail the installation and/or connection of services (sanitation, electricity, etc).

2.4.2 CONSTRUCTION PHASE

The construction process will follow industry standard methods and techniques. Key activities associated with the construction phase are described in **Table 2-4**.

Table 2-4 - Construction activities

Activity	Description
Transport of components and equipment to site	Bulk materials (aggregate, steel etc.), infrastructure components (masts, blades, tower sections etc), 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 (No. 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.
Excavation, earthworks and construction of foundations	Subject to the determination of founding specifications, earthworks will be required. This is likely to entail: Excavation of foundation holes to a depth of approximately 3m and pouring of concrete foundations from the batching plant. Concrete foundations will be constructed at each turbine location. Please note these dimensions may be larger as required by the geotechnical conditions. Levelling of the construction camp area, on-site substation area, and O&M building area, and excavation of foundations prior to construction. Excavation of trenches for the installation of underground cables.
Construction of wind turbines, site substation and BESS	A large lifting crane(s) will be required to lift the turbine sections (nacelle, blades) into place. The lifting crane/s will be brought on site and will be required to move between the turbine site. Cranes of varying sizes may be required depending on the size of the components.

Activity	Description
	An on-site IPP substation will be constructed on the site. The wind turbines will be connected to the on-site IPP substation via underground or overhead (if required) up to 33kV electrical cables. The BESS will typically require the placement of multiple containers to house the BESS components.
Establishment of ancillary infrastructure	Ancillary infrastructure will include construction site office, temporary laydown area and workshop area for contractor's equipment. Establishment of the ancillary infrastructure will require the clearing of vegetation, levelling, and the excavation of foundations prior to construction.
Rehabilitation	Once all construction is completed on site and all equipment and machinery has been removed from the site, the site will be rehabilitated. On commissioning, access points to the site not required during the operation phase will be closed and prepared for rehabilitation.

2.4.3 OPERATIONAL PHASE

The proposed Phefumula Emoyeni One WEF is anticipated to have a minimum life of 20 years. The facility will operate for 24 hours, 7 days a week. While the project is self-sufficient, maintenance and monitoring activities will be required. Potable water requirements for permanent staff will be limited. During the operational phase there will be little to no Project-related movement along the servitudes as activities are limited to maintaining the servitude (including maintenance of access roads and cutting back or pruning of vegetation to ensure that vegetation does not affect the WEF), inspection of the WEF infrastructure and repairs when required. Limited impact is expected during operation since there will not be any intrusive work done outside of maintenance in the event that major damage occurs to site infrastructure. Operation of the WEF will involve the following activities, discussed below.

- Servitude and access road maintenance is aimed at eliminating hazards and facilitating continued access to the WEF. The objective is to prevent all forms of potential interruption of power supply due to overly tall vegetation/climbing plants or establishment of illegal structures within the right servitude. It is also to facilitate ease of access for maintenance activities on the WEF. During the operational phase of the project, the servitude will be maintained to ensure that the functions optimally and does not compromise the safety of persons within the vicinity of the WEF.
- Phefumula Emoyeni One WEF will develop comprehensive planned and emergency programmes through its technical operations during the operation and maintenance phase for the WEF. The maintenance activities will include:
  - Periodic physical examination of the WEF and its safety, security and integrity.
  - Defects that are identified will be reported for repair. Such defects may include defective conductors, flashed over insulators, defective dampers, vandalised components, amongst others.
  - Maintenance / repairs will then be undertaken.

2.4.4 DECOMMISSIONING PHASE

Following the initial 20-year operational period of the wind facility, the continued economic viability will be investigated. If the facility is still deemed viable, the life of the facility will be extended. The facility will only be decommissioned once it is no longer economically viable. If a decision is made to completely decommission the facility, this will be subject to a separate authorisation and impact assessment process, all the components will be disassembled, reused and recycled or disposed. The

site would be returned to its current use i.e., residential, mixed farming, commercial hunting, and tourism purposes.

2.5 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 WEF has been considered from an international, national, and regional perspective.

2.5.1 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 WEF will therefore add capacity to the energy sector and generate 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 WEF qualifies as a clean technology that will generate up to 550MW of affordable energy to contribute to 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.

2.5.2 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 WEF 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 WEF 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 WEF 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 WEF 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.

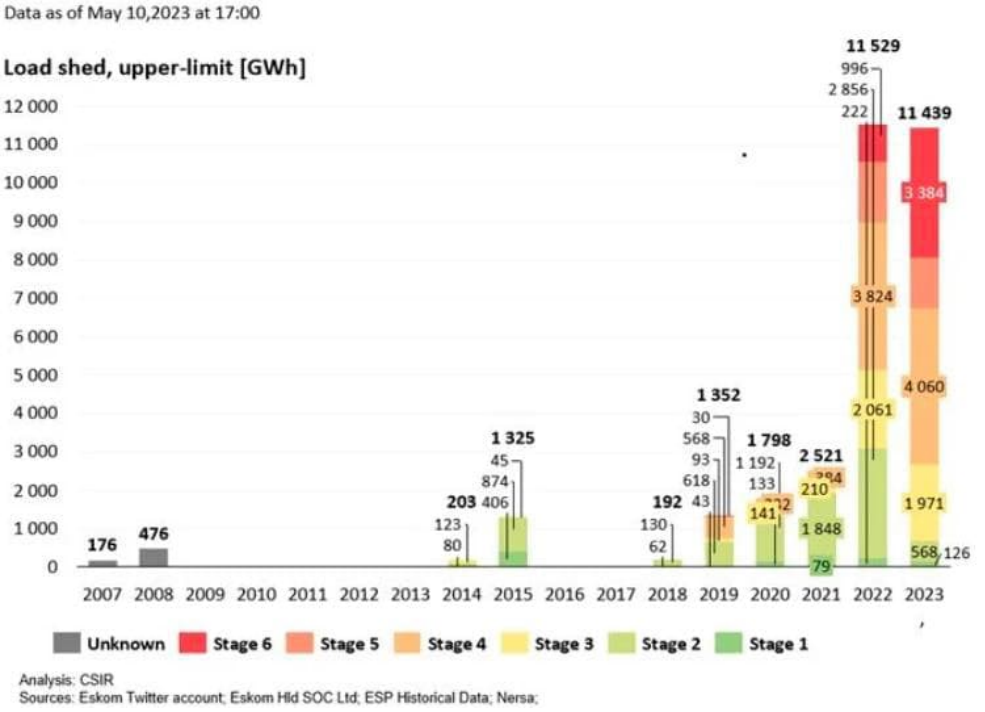


Figure 2-2 - Load shedding hours over the years in South Africa

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.

2.5.3 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 2-3.**

Figure 2-3 shows that the wind industry will create job opportunities throughout the supply chain. The wind industry will contribute to the Just Energy 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.

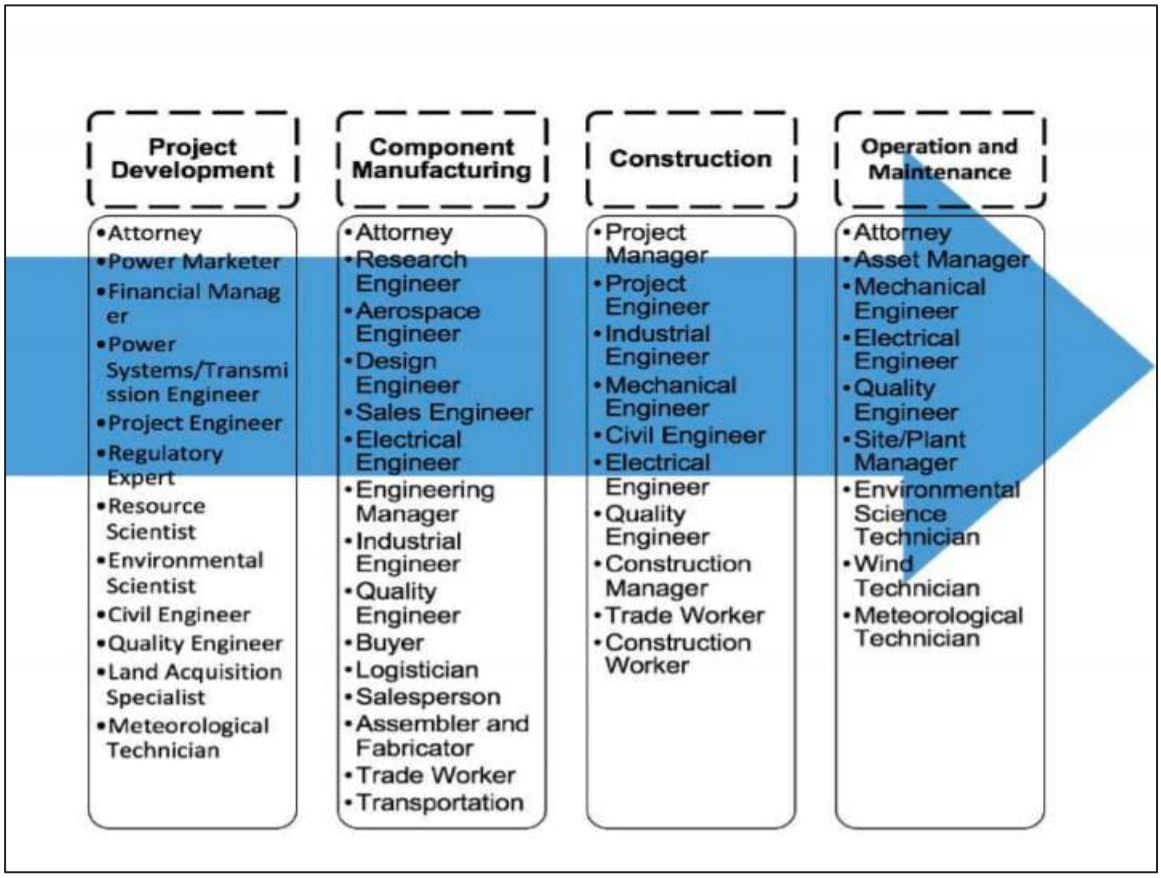


Figure 2-3: Career Opportunities presented by the Wind Industry (Source: https://www.res4africa.org/wp-content/uploads/2020/09/RES4Africa-Foundation-A-Just-Energy-Transition-in-South-Africa.pdf)

Multiple Land Use

Unlike opencast coal mining, the Project facilitates multiple land use functions within the development area. As wind turbines 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 WEF, is ideally located close to the Camden Power Station to help Eskom achieve its diversification goal.

3 ENVIRONMENTAL SENSITIVITY

3.1 SITE SENSITIVITY VERIFICATION SUMMARY

A summary of the DFFE screening tool, the applicable legislation as well as the specialist sensitivity verification are detailed in Table 3-1 below.

Table 3-1 - Assessment Protocols and Site Sensitivity Verification Summary

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	Very High 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	Very High Sensitivity	Confirmed moderate 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	High Sensitivity	Confirmed Low, Medium and 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 Sensitivity	Confirmed Low 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/High in areas of primary grassland and wetland habitat and areas designated as CBA Irreplaceable and CBA Optimal. Low/ Medium in areas of secondary grassland habitat. Very Low in areas of modified habitat.

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
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
Defence Assessment	Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Defence installations	Low Sensitivity	Confirmed Low Sensitivity
RFI Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Very High Sensitivity	Confirmed Low Sensitivity
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 primary grassland and wetland habitat.
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 grassland and wetland habitat.
Bat assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Bats	High Sensitivity	Confirmed High Sensitivity

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification
Avifauna Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Low Sensitivity	Confirmed High Sensitivity
Vulture Species theme	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Bats	Medium Sensitivity	Confirmed Low Sensitivity
Flicker Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Flicker installations	Very high Sensitivity	Confirmed High Sensitivity
Noise Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Noise impacts	Very high Sensitivity	Confirmed Very High Sensitivity

3.2 SENSITIVITY MAPPING

A consolidated environmental sensitivity map has been compiled based on the sensitivities and buffers outlined in the following specialist studies:

- Aquatic Biodiversity;
- Terrestrial Biodiversity;
- Heritage;
- Avifauna;
- Bats; and
- Visual.

The location of the project infrastructure (i.e., layout) was determined based on initial environmental and technical screening which considered the infrastructure locations feasible from a constructability perspective. This included several key aspects including environmental constraints and opportunities, distance to grid connection, topography, and site accessibility.

The conceptual layout (135 turbines) was assessed by the various Specialists during the Scoping Phase.

Based on sensitivities identified by specialists during the Scoping Phase, the project layout was optimised for the EIA phase. The conceptual layout was optimised based on the following:

- The revised layout reduced the number of turbines from 135 to 88.
- The infrastructure was repositioned based on the following specialist constraints:

- Bats – to ensure that blades do not infringe into the no-go areas;
- Noise - to ensure there are no turbines within 500m from NSRs;
- Heritage - to ensure that the turbines and roads avoid heritage features; and
- Terrestrial - to move turbines away from CBAs.

During the course of the EIA phase, the revised layout was optimised based on specialist inputs. These inputs included the following recommendations:

- Terrestrial Biodiversity:
  - Relocation of Turbine 04 such it falls outside of the NPAES area.
- Avifauna
  - WTG 85 and 86 are located within a recommended turbine exclusion (including rotor-swept area) buffer, these turbines need to micro-sited out of the exclusion zones. It is confirmed that these turbines were removed.
- Aquatic biodiversity assessment
  - It is strongly recommended that Turbine 42 be relocated to the north or east so that no part of its footprint is located within the delineated wetland boundary or associated 15m buffer.
  - Furthermore a number of access roads are proposed to be relocated:
  - The access road between Turbines WTG 79 and WTG 49 bisects a seep wetland. Turbine WTG 49 is able to be accessed from the district road to the south via a new realigned road that does not traverse the wetland or its buffer;
  - The access road to WTG 42 runs through the outer parts of a seep wetland. Along with the turbine and hardstand the road must be realigned to the north to be located outside of the wetland and its buffer area;
  - Consideration must be given to the non-development of access road 7 from the N11 highway. An existing farm access track to which access road 7 runs in parallel is located to the south and the crossings of two valley bottom wetlands (including the Klein Olifants Stream) are existing crossings. If this access track was upgraded this would avoid the need for two new wetland crossings;
  - The access road to WTGS21 bisects the upper part of a seep wetland. The road must be realigned to the west to run outside of the wetland and its 15m buffer;
  - Consideration should be given to a road realignment of the proposed internal road between WTG 56 and WTG 63. Rather it is proposed that the access road to turbines WTG 62,69 and 72 be extended to the north to turbine WTG 63. This would entirely avoid the need to cross the valley bottom wetland to the west of turbine WTG 63 as a result;
  - It is recommended that the access road between turbines WTG 75 and 77 not be developed. Both turbines are able to be accessed from other proposed roads.
- Bats:
  - Turbine 11, T12, T13, T27, T44, T47, T48, T49, T53, T56, T63, T68, T81, T82, and T88 have rotor sweep areas that encroach on High sensitivity buffers. These turbines will have to be moved.
  - It is confirmed that only T63 remains in a high sensitivity area. This turbine is currently being micro-sited and the final position will be included in the Final EIA Report.

- Heritage:
  - The ruins and semi-circular stone enclosures at PF006 impacted by WTG55 should preferably be avoided;
  - Burial sites which will be impacted by access roads (PF007, PF008, PF009) should preferably be avoided with a 30m buffer zone with access provided to family members. It is confirmed that only Burial site PF007 will be impacted by the access road which leads to WTG58.
- Noise
  - The closest wind turbine to these receptors (WTG88) be located slightly northwards, away from the receptors, so that noise levels remain below the 40 dB(A) threshold.
- Social:
  - The developers should liaise with the owners of the property to identify an alternative location for the substation and BESS. The owners have proposed an area on the northernmost site property.

During the course of the public review period in April 2025, recommendations in terms of the layout were received from MDARDLEA and MTPA. These recommendations have been appropriately applied resulting in a refined layout. **Table 3-2** outlines the response to the recommendations received:

Table 3-2 - Response to Recommendations received

Recommendation	Response
WTG 2: CBA Optimal; NPAES; Yellow-breasted Pipit and Rudd's Lark medium sensitivity zone.	From a collision risk point of view larks and pipits would be most at risk during their display flights performed during the early breeding season. When wind speeds increase significantly, display flights cease because it becomes energetically inefficient. Cut-in speed management during the spring summer season (i.e. wind turbines should only start turning above the wind speed when it is known that the larks and pipits will no longer perform display flights With the implementation of the above mentioned mitigation, WTG 2 remains in its existing position.
WTG 5: High aquatic sensitivity.	WTG 5 has been moved outside of the high aquatic zone / wetland buffer.
WTG 12: CBA Optimal; NPAES; Yellow-breasted Pipit and Rudd's Lark medium sensitivity zone; High Bat Sensitivity.	WTG 12 has been removed from the layout.
WTG 20: CBA Optimal; NPAES. Yellow-breasted Pipit & Rudd's Lark medium sensitivity habitat	WTG 20 has been moved out of the CBA optimal area.

Recommendation	Response
WTG 25: Within 650m of a Secretary Bird Nest.	It is acknowledged that the area is a dynamic system in terms of Secretarybird nesting sites and therefore a “strict” 2 km buffer zone around current possible nest sites would be a flawed approach as nesting sites are likely to change with each breeding season. Given the lack of nest site fidelity of this species, and in order to better manage the risk of known shifts in nest sites across breeding seasons, we have recommend a proactive adaptive risk management plan that is underpinned by routine and systematic nest surveys in medium risk areas identified through habitat and flight risk modelling for this species. WTG 25 remains in its existing position.
WTG 29: Within 400-500m of a waterbody frequented by Greater Flamingo.	WTG 29 has been removed from the layout
WTG 33: CBA Optimal; NPAES; Within 2km of a waterbody frequented by Greater Flamingo.	The habitat suitability model was developed to determine high-risk areas for flamingos based on algal blooms in the respective pans, and turbine exclusion zones were delineated. The associated risk model is a data-driven framework designed to inform the buffering of waterbodies and pans within a wind energy facility's area of interest (AOI). The model integrates multiple environmental and ecological datasets to determine suitable habitat conditions for foraging flamingo, ensuring appropriate setback distances for wind turbines to mitigate potential impacts. WTG 33 remains in its existing position.
WTG 42: High aquatic sensitivity.	WTG 42 has been moved out of the high aquatic sensitivity area.
WTG 56: Within 2km of a waterbody frequented by Greater Flamingo.	WTG 56 is not inside a turbine exclusion zone as the waterbody in question is not as productive as other waterbodies in the surrounding environment and the buffer applied to the said waterbody is deemed appropriate according to a comprehensive habitat suitability model The habitat suitability model was developed to determine high-risk areas for flamingos based on algal blooms in the respective pans, and turbine exclusion zones were delineated. The associated risk model is a data-driven framework designed to inform the buffering of waterbodies and pans within a wind energy facility's area of interest (AOI). The model integrates multiple environmental and

Recommendation	Response
	ecological datasets to determine suitable habitat conditions for foraging flamingo, ensuring appropriate setback distances for wind turbines to mitigate potential impacts WTG 56 remains in its existing position.
WTG 64: CBA Optimal; NPAES.	WTG 64 has been moved out of the CBA Optimal area.
WTG 66: CBA Optimal; NPAES. Black Pratincole medium sensitivity	WTG 66 has been moved out of the CBA Optimal area.
WTG 79: Within 2km of a waterbody frequented by Greater Flamingo.	WTG 79 has been removed from the layout.
WTGs 11, 12, 13, 27, 44, 47, 48, 49, 53, 56, 63, 68, 81 and 82: High bat sensitivity where turbines have a rotor diameter of 200m.	Taking into account the proposed rotor diameter of 182m, no turbines are located in high bat sensitivity areas.

Further to the above list of changes, WTG 73 has also been removed from the layout.

Figure 3-1 shows the environmental sensitivity features overlain with the Refined layout.

Table 3-3 - Mapping criteria utilised by the specialists for the assessment

No-Go	Areas or features that are considered of such sensitivity or importance that any adverse effects upon them may be regarded as a fatal flaw.
High	Areas or features that are considered to have high sensitivity. Development in these areas must be limited and must remain within any acceptable limits of change as determined by the specialist. Development should also comply with any other restrictions or mitigation measures identified by the specialist.
Medium	Medium sensitivity areas are considered to be developable; however, the nature of the effects should remain within any acceptable limits of change as determined by the specialist. Development should also comply with any other restrictions or mitigation measures identified by the specialist.
Low	Low sensitivity areas that are considered to be developable however specialists may still wish to define acceptable limits of change should they deem this necessary.

NO-GO AREA

Legislated “no go” areas or setbacks are areas or features that are considered of such significance that impacting them may be regarded as fatal flaw or strongly influence the project impact significance profile. Therefore, areas or features that are considered to have a high sensitivity or where project infrastructure would be highly constrained and should be avoided as far as possible are referred to as “no-go” areas. Infrastructure located in these areas are likely to drive up impact significance ratings

and mitigations. The assumption is that the overhead lines could span these areas, but the towers/pylons should adhere to the buffer distances as indicated as far as possible where areas are too large to span (buffers) then these tower positions must be evaluated on a case by case basis prior to construction.

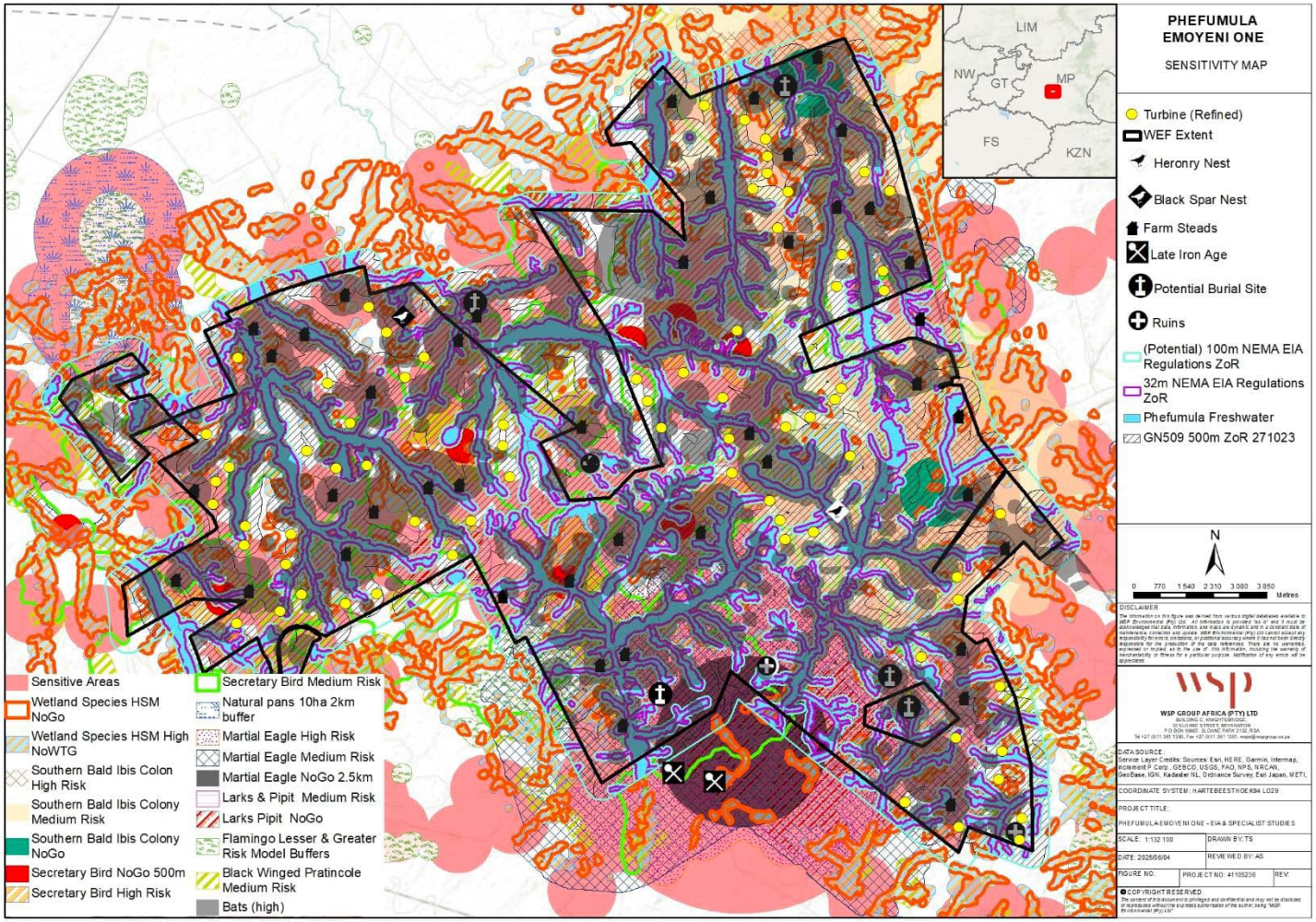


Figure 3-1 – Consolidated site sensitivity map overlain on the Refined Layout Map

3.3 IMPACT ASSESSMENT OUTCOMES

A summary of the identified impacts and corresponding significance ratings for the proposed project is provided in **Table 3-4** below.

Table 3-4 – Impact Summary

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Agriculture	Agricultural production potential of land	C/O	(-)	Low	Low
Aquatic Biodiversity	Hydrological alteration due to stormwater discharges, increased erosion or development of new erosion, and deposition of increased sediment due to vegetation clearance	C	(-)	Moderate	Low
	Destruction of a certain area of wetland habitat, sedimentation and water quality impacts related to clearing of Vegetation and Terrain Levelling	C	(-)	High	High
	Hydrological alteration due to stormwater discharges, increased erosion or development of new erosion, and deposition of increased sediment from dust or transported by stormwater due to construction of surface infrastructure	C	(-)	Low	Very Low
	Hydrological alteration due to stormwater discharges, increased erosion or development of new erosion, and deposition of increased sediment from dust or transported by stormwater due to construction outside of the delineated wetland boundary	C	(-)	Low	Low
	Potential pollution (water quality impacts), impacts on wetland soils, hydrology and vegetation	C	(-)	Moderate	Moderate
	Water Quality impacts and damage to wetland soils and vegetation	C	(-)	Low	Low
	Permanent loss of a certain area of wetland habitat		(-)	High	High
	Hydrological alteration due to stormwater discharges related to operation and maintenance of the surface infrastructure located outside the delineated freshwater ecosystems	O	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Operation and maintenance of the proposed main access roads and other existing roads traversing freshwater ecosystems	O	(-)	Moderate	Low
	Potential Direct and Indirect impacts related to removal of all surface infrastructure from the project area.	D	(-)	Low	Low
Avifauna	Noise pollution and environmental disruption : Displacement of priority species from breeding/feeding/roosting areas	C	(-)	Moderate	Moderate
	Habitat transformation: Displacement of priority species from breeding/feeding/roosting areas	O	(-)	High	Moderate
	Bird mortality and injury: Population reduction of priority species	O	(-)	High	Moderate
	Electrocution of priority species on the on-site sub-stations and internal 33kV network	O	(-)	Moderate	Low
	Collisions of priority species with the internal 33kV network	O	(-)	High	Moderate
	Noise pollution and environmental disruption: Total/partial displacement of priority species from breeding/feeding/roosting areas	D	(-)	High	Moderate
Bat Monitoring and Impact Assessment	Disturbance of bat roosts	C	(-)	High	Moderate
	Terrestrial habitat loss, and possible displacement of bats	C	(-)	High	Moderate
	Bat fatalities from collision with turbines, and possible population declines	O	(-)	Very High	Moderate
	Declines in certain species populations, the ecosystem services	O	(-)	High	Moderate
	Disturbance of bat roosts	D	(-)	High	Low
	Terrestrial habitat loss, and possible displacement of bats	D	(-)	Low	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
Animal Species	Direct loss and disturbance of natural habitat.	C	(-)	High	Moderate
	Fragmentation reducing natural habitat connectivity and integrity	C	(-)	High	Moderate
	Impact on fauna SCC: Injury, mortality and disturbance of fauna	C	(-)	Moderate	Low
	Impact on fauna SCC: Injury and mortality of fauna, including SCC	O	(-)	Moderate	Low
	Impact on fauna SCC: Vibrations impacts from operating wind turbines disturbing fauna	O	(-)	Moderate	Low
	Impact on fauna SCC: Injury and mortality of fauna, including SCC.	D	(-)	Moderate	Low
Terrestrial Biodiversity	Direct loss and disturbance of natural habitat.	C	(-)	High	Moderate
	Fragmentation reducing natural habitat connectivity and integrity	C	(-)	High	Moderate
	Establishment and spread of alien invasive species.	C	(-)	Moderate	Low
	Increased soil erosion and sedimentation.	C	(-)	Moderate	Low
	Establishment and spread of alien invasive species.	O	(-)	Moderate	Low
	Increase in wildfires from Project workers or faulty infrastructure.	O	(-)	Moderate	Low
	Establishment and spread of alien invasive species.	D	(-)	Moderate	Low
	Increased soil erosion and sedimentation	D	(-)	Moderate	Low
Plant Species	Direct loss and disturbance of natural habitat	C	(-)	High	Low
	Fragmentation reducing natural habitat connectivity and integrity	C	(-)	High	Moderate
	Loss of flora of conservation concern	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Establishment and spread of alien invasive species	C	(-)	Moderate	Low
	Establishment and spread of alien invasive species	O	(-)	Moderate	Low
	Establishment and spread of alien invasive species	D	(-)	Moderate	Low
Geotechnical	Soil Erosion Impacts	C	(-)	Moderate	Very Low
	Contamination of ground and surface water resources	C	(-)	Moderate	Very Low
	The displacement of natural earth material and overlying vegetation leading to erosion	C	(-)	Moderate	Very Low
	Slope instability around structures.	C	(-)	Low	Very Low
	Seismic activity	C	(-)	Vey Low	Very Low
	Soil Erosion Impacts	D	(-)	Moderate	Very Low
	Contamination of ground and surface water resources	D	(-)	Moderate	Very Low
	The displacement of natural earth material and overlying vegetation leading to erosion.	D	(-)	Moderate	Very Low
	Slope instability around structures	D	(-)	Low	Vey Low
Heritage	Loss of heritage resources.	C	(-)	Moderate	Very low
	Impact to graves in burial sites.	C	(-)	Moderate	Very Low
	Loss of heritage resources	O	(-)	Moderate	Very Low
	Impact to graves in burial sites	O	(-)	Moderate	Very Low
	Loss of heritage resources	D	(-)	Moderate	Very Low
	Impact to graves in burial sites	D	(-)	Moderate	Very Low
Noise	Nuisance	C	(-)	Low	Vey Low
	Nuisance	O	(-)	Moderate	Low
	Nuisance	D	(-)	Low	Very Low
Traffic	Increase in Development Trips	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Slight increase in trips due to transport of permanent staff to site	O	(-)	Low	Low
	Increase in Development Trips	D	(-)	Moderate	Low
Visual	Visual Impacts - Airborne dust	C	(-)	Moderate	Low
	Visual Impacts - Presence of visually intrusive construction related activities and equipment in the landscape	C	(-)	High	Moderate
	Visual Impact - Reduction in visual resource value	O	(-)	Very High	Very High
	Visual Impacts - Flicker nuisance from painted spinning blades	O	(-)	Low	Very Low
	Visual Impacts -Flicker nuisance from painted spinning blades	O	(-)	Moderate	Moderate
	Light pollution at night due to turbine safety and project site security lighting	O	(-)	High	Moderate
	Visual Impacts - Airborne dust	D	(-)	Moderate	Low
	Visual Impacts - Presence of visually intrusive construction	D	(-)	Moderate	Low
Social	Increase in local employment, training and business opportunities	C	(+)	Moderate	High
	Influx of job seekers: Increased number of people seeking for jobs	C	(-)	Moderate	Vey Low
	Increased risk of grass fires	C	(-)	Low	Low
	Threat to Community health, safety and Security	C	(-)	Moderate	Vey Low
	Risk to safety, loss of agricultural land and damage to farm infrastructure	C	(-)	Moderate	Low
	Threat to Community health, safety and Security	C	(-)	Moderate	Very Low
	Environmental Health: Noise and dust generated from construction vehicles	C	(-)	Moderate	Very Low
	Increase in local employment	O	(+)	Moderate	Moderate
	Influx of job seekers	O	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Threat to Community health, safety and Security	O	(-)	Low	Low
	Environmental Health: Noise and dust generated from construction vehicles	O	(-)	Low	Low
	Visual Impacts: Obstruction of natural scenic view	O	(-)	Low	Low
	Energy Generation: Provision of more reliable, stable energy source	O	(+)	Moderate	High
	Retrenchment	D	(-)	Moderate	N/A
	Loss of livelihood (increase in poverty)	D	(-)	High	Moderate
High Level Safety, Health and Environmental Risk Assessment	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human Health - exposure to noise	C	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	C	(-)	Low	Very Low
	Human Health - exposure to psychological stress	C	(-)	Low	Low
	Human Health - exposure to ergonomic stress	C	(-)	Low	Low
	Human and Equipment Safety - exposure to fire radiation	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to explosion over pressures	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	C	(-)	Moderate	Low
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	C	(-)	High	Low
	Human and Equipment Safety - exposure to electromagnetic waves	C	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Environment - emissions to air	C	(-)	Low	Very Low
	Environment - emissions to water	C	(-)	Low	Very Low
	Environment - emissions to earth	C	(-)	Low	Low
	Environment - waste of resources e.g., water, power etc	C	(-)	Low	Very Low
	Public - Aesthetics	C	(-)	Low	Low
	Investors - Financial	C	(-)	Moderate	Low
	Employees and investors - Security	C	(-)	Moderate	Low
	Emergencies	C	(-)	Moderate	Low
	Investors - Legal	C	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	O	(-)	Moderate	Low
	Human Health - exposure to noise	O	(-)	Moderate	Low
	Human Health - exposure to temperature extremes and/or humidity	O	(-)	Low	Very Low
	Human Health - exposure to psychological stress	O	(-)	Low	Very Low
	Human Health - exposure to ergonomic stress	O	(-)	Low	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to fire radiation	O	(-)	High	Low
	Human and Equipment Safety - exposure to explosion over pressures	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	O	(-)	Moderate	Low

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	O	(-)	Moderate	Low
	Human and Equipment Safety - exposure to electromagnetic waves	O	(-)	Moderate	Low
	Environment - emissions to air	O	(-)	Low	Very Low
	Environment - emissions to water	O	(-)	Low	Low
	Environment - emissions to earth	O	(-)	Low	Very Low
	Environment - waste of resources e.g., water, power etc	O	(-)	Low	Low
	Public - Aesthetics	O	(-)	Low	Low
	Investors - Financial	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Employees and investors - Security	O	(-)	Moderate	Low
	Emergencies	O	(-)	Moderate	Low
	Investors - Legal	O	(-)	Moderate	Low
	Human Health - chronic exposure to toxic chemical or biological agents	D	(-)	N/A	N/A
	Human Health - exposure to noise	D	(-)	N/A	N/A
	Human Health - exposure to temperature extremes and/or humidity	D	(-)	N/A	N/A
	Human Health - exposure to psychological stress	D	(-)	N/A	N/A
	Human Health - exposure to ergonomic stress	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to fire radiation	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to explosion over pressures	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to acute toxic chemical and biological agents	D	(-)	N/A	N/A

Aspect	Impact Description	Phase	Character	Without Mitigation	With Mitigation
	Human and Equipment Safety - exposure to violent release of kinetic or potential energy	D	(-)	N/A	N/A
	Human and Equipment Safety - exposure to electromagnetic waves	D	(-)	N/A	N/A
	Environment - emissions to air	D	(-)	N/A	N/A
	Environment - emissions to water	D	(-)	N/A	N/A
	Environment - emissions to earth	D	(-)	Moderate	Low
	Environment - waste of resources e.g., water, power etc	D	(-)	N/A	N/A
	Public - Aesthetics	D	(-)	N/A	N/A
	Investors - Financial	D	(-)	N/A	N/A
	Employees and investors - Security	D	(-)	N/A	N/A
	Emergencies	D	(-)	N/A	N/A
	Investors - Legal	D	(-)	Moderate	Low

3.4 BIODIVERSITY OFFSET STRATEGY

South Africa's National Biodiversity Offset Guideline was gazetted in 2023. It sets out the requirements for the development of a Biodiversity Offset Report (BOR) in support of an application for environmental authorisation (EA). The proposed Phefumula Emoyeni One WEF is considered highly likely to require a BOR, effectively as a result of its location in an area that supports extensive areas of natural wetland and grassland habitat, some of which has been defined as Critical Biodiversity Areas (CBAs) in the Mpumalanga Biodiversity Sector Plan (MBDSP), as well as populations of bird species of conservation concern (SCC) (e.g. Southern Bald Ibis, Martial Eagle, Secretarybird, Yellow-billed Stork, African Grass Owl, Denham's Bustard, White-bellied Bustard), many of which are at risk of collision with wind turbines. The anticipated Project interaction with these features (habitat loss, collision mortality of bird species of concern) factors are expected to result in significant residual impacts, which would then require offset.

South Africa's draft National Biodiversity Offset Guideline was published for public consultation on 25 March 2022, which sets out the requirements for the development of a Biodiversity Offset Report (BOR) in support of an application for environmental authorisation (EA). A Biodiversity Offset Report was compiled based on the guidance set out in the draft guideline and is included as Appendix K of the Draft EIA Report.

3.5 APPLICABLE DOCUMENTATION

The following documents are to be read in conjunction with the EMPr:

- EIR for the Proposed Phefumula Emoyeni One WEF;
- Biodiversity Offset Strategy for the Proposed Phefumula Emoyeni One WEF;
- Biodiversity Action Plan to be prepared, subsequent to the finalised layout, in consultation with the relevant authorities and conservation organisations;
- Generic EMPR for the development and expansion of substation infrastructure for the transmission and distribution of electricity; and
- Should the project be authorised, the EA issued by the DFFE in terms of the NEMA.

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 33kV, 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 distribution/ Switching Stations as part of the infrastructure (switching stations included in the grid infrastructure EIA).

Legislation	Description of Legislation and applicability
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 Facility 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 Facility 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 in the Final EIA Report.
Listing Notice 1: GNR 983	**Activity 14** The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres. **Description:** The Facility will require storage and handling of dangerous goods, including fuel, cement, and chemical storage onsite, that will be greater than 80m3 but not exceeding 500m3. This activity will also be applicable in the event that Redox Flow Battery technology is considered preferred.
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 and stormwater control infrastructure, as well as electrical cabling required to connect the various components of the Facility will collectively require the excavation, infilling or removal of soil exceeding 10m3 from delineated watercourses on site. The values associated with the Final Layout will be confirmed in the Final EIA Report.
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 Facility 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.

Legislation	Description of Legislation and applicability
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 Facility is considered an industrial development, and is 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 Facility (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 Facility 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 crossing infrastructure collectively exceeding 100m2 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 in the Final EIA Report.
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—

Legislation	Description of Legislation and applicability
	(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 1(a)** The development of facilities or infrastructure for the generation of electricity from a renewable resource where the electricity output is 20 megawatts or more, **Description:** The proposed energy generation technology (i.e. Wind) will generate more than 20MW of electricity output from a renewable resource (estimated at 550 MW).
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 switching stations /distribution substations which will each have an IPP portion. Each substation may have a distribution capacity of up to 400kV. The capacity associated with these substations will be confirmed in the Final EIA Report.
Listing Notice 2: GNR 984	**Activity 15(i)** The clearance of an area of 20 hectares or more of indigenous vegetation **Description:** This activity will be triggered by the WEF as it will result in the clearance of at least 20 hectares or more of indigenous vegetation. The values associated with the Final Layout will be confirmed in the Final EIA Report.
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).***
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

Legislation	Description of Legislation and applicability
	(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:** Internal access roads required 8-10m wide roads with 12m radius turning circles, gravel surface. The exact values will be confirmed in the Final EIA Report. Furthermore, roads required for the Facility 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 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 80m3 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 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 facility, however, the full extent is not yet known. Such clearance will be in excess of 300m2 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 300m2, required for the Facility 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 in the Final EIA Report.
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 Facility 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 Facility 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 internal access roads, stormwater control

Legislation	Description of Legislation and applicability
	infrastructure and electrical cabling required to connect the various components of the Facility 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). Similarly, the development activity contemplated will be located 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 in the Final EIA Report
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 facility 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 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 Facility 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 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 in the Final EIA Report
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 04/09/2023. The following environmental themes were applicable to the Phefumula Emoyeni One WEF: ■ Agricultural Theme ■ Animal Species Theme ■ Aquatic Biodiversity Theme ■ Archaeological and Cultural Heritage Theme ■ Avian (Wind) theme ■ Bats (Wind) Theme ■ Civil Aviation Theme ■ Defence Theme ■ Flicker Theme ■ Palaeontology Theme ■ Plant Species Theme ■ Noise Theme ■ Landscape (Wind 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 concern (SoC), and bird surveys of the area to define the potential risks to bird SoC. 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 Environmental Management Act)	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 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

Legislation	Description of Legislation and applicability
(First Edition (October 2021)	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 has been compiled and is included in the EIA Report. 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. 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.

Legislation	Description of Legislation and applicability
	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-* *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

Legislation	Description of Legislation and applicability
	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 WEF, 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 Heritage Impact Assessment Report has been carried out by a suitably qualified specialist, revealing: ■ The Project area is situated within a large, open landscape of which large sections have been used for agricultural activities as well as cattle farming. Many farmsteads are also situated throughout the Project area, with some still being occupied. A total of 37 sites were recorded during the survey which includes multiple burial sites, farmsteads, ruins, circular stone enclosures, and possibly historically planted trees; ■ On the current layout the ruins/packed stone foundations and semi-circular enclosures at PF006 will be impacted by the WTG55 and avoidance of the site is preferable. If avoidance is not possible, the site will require mitigation through recording and mapping prior to applying for the appropriate destruction permit; ■ Three burial sites (PF007, PF008, PF009) will be impacted by access roads. Burial site PF007 will be impacted by the access road which leads to WTG58. Burial site PF008 is situated next to an existing gravel road but the burial site will be impacted by widening of the road as well as during the use of the road. Burial site PF009 is situated between ploughed fields next to an existing gravel road leading to WTG13 and the expanding of the road and use thereof will encroach the 30m buffer zone of the burial site. It is always preferable to avoid all burial sites with a 30m buffer zone. If avoidance of these three burial sites is not possible, the graves can be moved with the relevant permits. A Grave management plan for the burial sites will also have to be compiled as well as access provided to burial sites for family members wishing to visit the graves. ■ Due to the change in Project layout after the survey was conducted, some areas were not surveyed and a Heritage Walk-down will be required of the final Project layout prior to construction; and ■ According to the SAHRA Paleontological sensitivity map the study area is of insignificant and very high palaeontological sensitivity and an independent study was commissioned for this aspect (Bamford 2024). The proposed project has been loaded onto the SAHRIS portal for comment and was allocated the Case ID: 22347.
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.

Legislation	Description of Legislation and applicability
Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	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 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 (Act 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

Legislation	Description of Legislation and applicability
	fulfilled by South African Civil Aviation Authority (SACAA) as an agency of 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). As of the 1st of May 2021, Air Traffic and Navigation Services (ATNS) has been appointed as the new Obstacle application Service Provider for Windfarms and later Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Windfarms and in due time Power Plant assessments. The DFFE Screening Tool Report identified Civil Aviation as having Low-Medium-High sensitivity for the proposed WEF, as portions of the footprint being located within 8km and between 8 and 15km of other civil aviation aerodrome. 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 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 demand and resource

Legislation	Description of Legislation and applicability
	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. 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.

Applicable Policy	Description of Policy
	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 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. The NIP 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.

Applicable Policy	Description of Policy
	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-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.

Applicable Policy	Description of Policy
	▪ 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 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, 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

Applicable Policy	Description of Policy
	planning which may identify a range of different priority sites based on local requirements, constraints and opportunities (NPAES, 2018). According to the 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.
Biodiversity Management Plan (BMP) for Vultures in South Africa published in terms of section 43 of the National Environmental Management Biodiversity Act, 2004 (Act no. 10 of 2004)	The Biodiversity Management Plan (BMP) for Vultures in South Africa, published in terms of Section 43 of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004), is a strategic document developed to address the conservation and management of vulture species in the country. The primary aim of the BMP is to ensure the long-term survival and recovery of vulture populations, which have been significantly impacted by various threats such as poisoning, habitat destruction, and the decline of food sources.

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 has a 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 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 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

Applicable Plan	Description of Plan
	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 • 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

Applicable Plan	Description of Plan
	• 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; • 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. ▪ 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 third 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 has been compiled.
	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.		

Reference	Requirements		Project Specific Applicability
	▪ 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 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 incorporates the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
	2.2	Protecting the Workforce Child Labour Forced Labour	
	2.3	Occupational health and Safety	
	2.4	Workers Engaged by Third Parties	
	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 includes 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 WEF seeks to
	3.2	Pollution Prevention Air Emissions Stormwater Waste Management Hazardous Materials Management Pesticide use and Management	

Reference	Requirements		Project Specific Applicability
			facilitate resource efficiency and pollution prevention by contributing to the South African green economy. Dust air pollution in the construction phase is addressed in this EMPr. The Project will not result in the release of industrial effluents. Potential pollution associated with sanitary wastewater is low and mitigation measures is included in this 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. The waste generation profile of the project is not complex. Waste mitigation and management measures is 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. This EMPr has taken 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, are 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.		

Reference	Requirements		Project Specific Applicability
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. ▪ 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 WEF as no physical or economic displacement or livelihood restoration will be required. The proposed Phefumula Emoyeni One WEF 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 are included in the EMPr.
Performance Standard 7: Indigenous People			

Reference	Requirements		Project Specific Applicability
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.		

Reference	Requirements		Project Specific Applicability
	▪ To promote the equitable sharing of benefits from the use of cultural heritage.		
Aspects	8.1	Protection of Cultural Heritage in Project Design and Execution	A Heritage Impact Assessment Report has been carried out by a suitably qualified specialist, revealing that archaeological sites (Stone Age and Historic Archaeological), cultural heritage sites, burial grounds or isolated artifacts are unlikely to be present on the affected landscape. A Chance Find Procedure is included in the EMPr.

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 wind energy facilities activities may include, among others, impacts on the physical environment (such as noise or visual impact) and biodiversity (affecting birds and bats, for instance).
  - Due to the typically remote location of wind energy facilities, 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 wind energy projects and facilities include the following:

- Landscape, Seascape, and Visual impacts;
- Noise;
- Shadow Flicker; and
- 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 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	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 has been compiled.

Requirement		Project Specific Applicability
	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 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	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
	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 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 EMPr will include a Grievance Mechanism Process for Public Complaints 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.

Requirement		Project Specific Applicability
	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.	
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 EMPr for Substations is included in this Site-Specific EMPr as **Appendix E**.

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	A Case has been opened on SAHRIS (Case ID: 22347) Further comments will be expected during the course of the EIA Phase.
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 MANAGEMENT PROCEDURES AND ADMINISTRATIVE REQUIREMENTS

5.1 ORGANISATIONAL STRUCTURE AND RESPONSIBILITIES

Formal responsibilities are necessary to ensure that key management measures/procedures are executed. Phefumula Emoyeni One Wind (Pty) Ltd (Phefumula Emoyeni One), (the Project Company), will be responsible for the overall control of the project site during the pre-construction, construction, operation, decommissioning and rehabilitation phases of the project. Phefumula Emoyeni One's responsibilities will include the following:

- Appointing an independent environmental control officer (ECO) for the duration of the Contract during construction and as specified by the DFFE during operation;
- Being fully familiar with the EIR, EA conditions and the EMPr;
- Applying for an amendment of the EA from the DFFE as and when required in line with the prevailing legislation;
- The overall implementation of the EMPr;
- Ensuring compliance, by all parties, and the imposition of penalties for noncompliance;
- Implementing corrective and preventive actions, where required;
- Ensuring that any other necessary permits or licences are obtained and complied with;
- Preventing pollution and actions that will harm or may cause harm to the environment;
- Notifying the DFFE within 30 days that construction activity will commence;
- Notifying the DFFE in writing within 24 hours if any condition in the EA cannot be or is not adhered to; and
- Notifying the DFFE 14 days prior to commencement of the operational phase.

Specific roles and responsibilities for the construction phase of this project are as defined in **Table 5-1**.

While the term ECO is referenced in Specialist Reports, the ECO is an independent function, reporting to the DFFE. The term used in this EMPr for the Permit Holder's onsite compliance management function is Environmental Site Compliance Officer (ESCO).

Table 5-1 – Roles and Responsibilities

Designation	Roles and Responsibilities
DFFE	▪ Is the designated authority responsible for approving this EMPr and has overall responsibility for ensuring that Phefumula Emoyeni One complies with this EMPr, and any conditions listed in the Environmental Authorisation. ▪ Shall also be responsible for approving any significant amendments that may be required to the EMPr. ▪ May further perform random site inspections to check compliance with the EMPr.
Holder of the EA	▪ The Holder of the EA shall take overall responsibility for the adherence to the EMPr and EA conditions.

Designation	Roles and Responsibilities
Project Manager/Engineer/Site Engineer	▪ Ensure that Phefumula Emoyeni One and the relevant contractor/s are aware of all specifications, and legal constraints pertaining to the project during construction, specifically with regards to the environment. ▪ Ensure that all stipulations within the EMPr and conditions of the environmental authorisation are communicated and adhered to by Phefumula Emoyeni One and its contractor(s). ▪ Monitor the implementation of the EMPr and conditions of the environmental authorisation throughout the project by means of site inspections and meetings. This will be documented as part of the site meeting minutes. ▪ Be fully conversant with the EIR for the project, the conditions of environmental authorisation and all relevant environmental legislation.
Site Manager (EPC Contractor)	▪ Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr. ▪ Approve method statements (co-approval with the ESCO). ▪ Provide support to the ESCO. ▪ Be fully conversant with all relevant environmental legislation and ensure compliance thereof. ▪ Have overall responsibility for the implementation of the EMPr and conditions of the environmental authorisation ▪ Ensure that audits are conducted to ensure compliance to the EMPr and conditions of the environmental authorisation. ▪ Liaise with the Project Manager or his delegate, the ESCO and others on matters concerning the environment ▪ Prevent actions that will harm or may cause harm to the environment and take steps to prevent pollution and unnecessary degradation onsite. ▪ Confine construction activities to demarcated areas.
Environmental Officer (EO)	The EO must be appointed by the Contractor / Project Manager and is responsible for managing the day-to-day onsite implementation of the EMPr, and for the compilation of weekly environmental monitoring reports during construction. During the operational phase environmental monitoring reports may be as specified by the DFFE (such as annually) by the external EO or ECO. In addition, the EO must act as liaison and advisor on all environmental and related issues, seek advice from the ESCO when necessary, and ensure that any complaints received from I&APs are duly processed and addressed and that conflicts are resolved in an acceptable manner and timely manner. The EO shall be a full-time dedicated member of the Contractor's team and must be approved by Phefumula Emoyeni One (Project Company). The following qualifications, qualities and experience are recommended for the individual appointed as the EO: ▪ A relevant environmental diploma or degree in natural sciences, as well as a minimum of three years' experience in construction site monitoring, excluding health and safety; ▪ A level-headed and firm person with above-average communication and negotiating skills. The ability to handle and address conflict management situations will be an advantage; and ▪ Relevant experience in environmental site management and EMPr compliance monitoring. The EO's responsibilities include, but not limited to:

Designation	Roles and Responsibilities
	▪ Monitoring, on a daily basis, environmental specifications on site and compliance with the conditions of the EA, environmental legislation and EMPr; ▪ Keeping a register of compliance / non-compliance with the environmental specifications; ▪ Identifying and assessing previously unforeseen, actual or potential impacts on the environment; ▪ Ensuring that a brief weekly environmental monitoring report is submitted to the ESCO; ▪ Conducting site inspections during the defects liability period, and bringing any environmental concerns to the attention of the ESCO and Contractor; ▪ Advising the Contractor on the rectification of any pollution, contamination or damage to the construction site, rights of way and adjacent land; ▪ Attending site meetings (scheduled and ad hoc); ▪ Presenting the environmental awareness training course to all staff, Contractors and Sub contractors, and monitoring the environmental awareness training for all new personnel on-site, as undertaken by the Contractor; ▪ Ensuring that a copy of the EA and the latest version of the EMPr are available on site at all times, and maintaining a records-keeping system of all compliance and environmental documentation; ▪ Ensuring that the Contractor is made aware of all applicable changes to the EMPr that are approved by the DEA; ▪ Assisting the Contractor in drafting environmental method statements and/or the Environmental Policy where such knowledge/expertise is lacking; ▪ Undertaking daily environmental monitoring to ensure the Contractor's activities do not impact upon the receiving environment. Such monitoring shall include dust, noise and water monitoring; and ▪ Maintaining the following on site: • A weekly site diary. • A non-conformance register (NCR). • An I&AP communications register, and • A register of audits. • Records of all communication received in relation to compliance actions. The EO will remain employed until all rehabilitation measures, as required for implementation due to construction damage, are completed and the site is handed over to the Operator.
ESCO	A suitably qualified ESCO must be appointed by the Holder of the EA to monitor the project compliance onsite on a full-time basis. Responsibilities of the ESCO include: ▪ Be fully conversant with the EIR, the conditions of environmental authorisation and the EMPr; ▪ Be fully conversant with all relevant environmental legislation and ensure compliance thereof; ▪ Approve method statements (co-approval with the Site Manager); ▪ Remain employed until the completion of the construction activities; and ▪ Report to the Project Manager, including all findings identified onsite. In addition, the ESCO will:

Designation	Roles and Responsibilities
	▪ Undertake monthly inspections of the site and surrounding areas in order to audit compliance with the EMPr and conditions of the environmental authorisation; ▪ Take appropriate action if the specifications contained in the EMPr and conditions of the environmental authorisation are not followed; ▪ Monitor and verify that environmental impacts are kept to a minimum, as far as possible; and ▪ Ensure that activities onsite comply with all relevant environmental legislation.
ECO	▪ A suitably qualified external ECO must be appointed by the Holder of the EA to audit the project compliance in terms of the EMPr and conditions of the EA on a monthly basis, during the construction phase. ▪ The costs of the ECO shall be borne by the Holder of the EA (proof of appointment must be maintained onsite).
Contractors, Staff and Service Providers	▪ Prepare Method Statements as per the EMPr, and ensure all activities are conducted as per the approved Method Statements. ▪ Regular on-site auditing to assess performance against the requirements of this EMPr. ▪ Completion of the appropriate training requirements as specified in the training program. ▪ Implementation and maintenance of environmental management controls as set out in the project's environmental management documentation.

Refer to: Table 1 (Part A, Section 3) of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix E .

5.2 ENVIRONMENTAL AWARENESS PLAN

Legislation requires that Phefumula Emoyeni One (via the appointed EPC contractor/contractor/principal contractor) must develop an environmental awareness plan that describes the manner in which Phefumula Emoyeni One intends to inform employees of any environmental risks which may result from their work and the manner in which the risks must be dealt with in order to avoid pollution or the degradation of the environment. In recognition of the need to protect our environment, environmental management should not only be seen as a legal obligation but also as a moral obligation.

It is important to ensure that all relevant personnel have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental degradation and harm.

To achieve effective environmental management, it is important that employees, contractors (including subcontractors) are aware of the responsibilities in terms of the relevant environmental legislation and the contents of the EMPr, conditions of the environmental authorisation.

Phefumula Emoyeni One will provide appropriate resources to facilitate social and environmental awareness training during the construction, operational and decommissioning phases of the project. Phefumula Emoyeni One will require that all managers associated with the project adhere to the

mitigation/management measures detailed in the EMPr and identify, evaluate, and minimise risks to the social, physical and biophysical environments. This will be implemented by educating employees in social and environmental matters and responsibilities relating to performance of their assigned tasks. Furthermore, employees will be entrusted to maintain the necessary level of environmental performance for their activities. Contractors, and their associated sub-contractors, will also need to demonstrate compliance to mitigation/ management measures included in the EMPr.

The following methodology described must be used to implement and ensure environmental and social awareness and competence:

5.2.1 INTERNAL COMMUNICATION

Internal Communication of environmental issues to ensure environmental awareness will be achieved by using any combination of the following means:

- Meetings;
- Memos;
- Notice boards;
- Briefs;
- Reports;
- Monthly themes;
- Daily operational bulletins;
- Newsletter;
- E-mail;
- Telephone; and
- Induction training.

5.2.2 STANDARD MEETINGS

The following standard meetings will be held at specific times to ensure that environmental and social awareness; potential problems; complaints etc. are heard and addressed proactively:

- Safety, Health and Environmental Meetings will be held monthly by the Senior Management;
- Safety, Health and Environmental Meetings will be held weekly (during construction) and monthly (during operation) by the relevant personnel, environmental and social issues will form part of the agenda;
- Communication between all personnel and Senior Management will be facilitated through the appropriate reporting lines, or by using complaint and incident forms.

5.2.3 ENVIRONMENTAL AND SOCIAL TALK TOPICS

Monthly environmental and social talk topics must be compiled and distributed/shared to relevant personnel and must be displayed on appropriate notice boards or shared by whatever means established on site. As a minimum, the following topics must be considered during the course of the construction phase:

- Water Quality;
- Water Use and Consumption;
- Air Quality i.e. dust;
- Power Consumption and Energy Efficiency;
- Waste Management;

- Fauna and Flora;
- Emergency Procedures;
- Incidents Reporting;
- Systems;
- Noise;
- Heritage Impacts;
- Landowner Etiquette;
- Speed Limits;
- Health Risks (such as HIV/ Aids); and
- General Awareness (e.g. World Environment Day, National Arbour Day).

5.2.4 GENERAL COMMUNICATIONS

Communication to the community, government, landowners, neighbouring farmers, environmental groups, non-government organisations and other stakeholders will be communicated to ensure environmental and social awareness by means of the following:

- Fax or E-mail;
- Telephone; or
- Formal meetings.

5.2.5 TRAINING

It is important to ensure that all personnel, contractors and their sub-contractors have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and on-going minimisation of environmental harm. As a minimum environmental training must include the following:

- Employees must have a basic understanding of the key environmental features of the site and the surrounding environment.
- Employees will be thoroughly familiar with the requirements of the EMPr and the environmental specifications as they apply to the project.
- Employees must undergo training for the operation and maintenance activities associated with project and have a basic knowledge of the potential environmental impacts that could occur and how they can be minimised and mitigated.
- Awareness of any other environmental matters, which are deemed to be necessary by the Environmental Officer.
- Training must include the environment, health and safety as well as basic HIV/AIDS education.

The following facets to training form part of this Environmental and Social Awareness Plan:

- **Induction:** Environmental and social awareness training will be given at induction when personnel join the company and/or return from leave. Induction training will also be given to visitors entering the site. Induction training will include, inter alia:
  - A discussion on the environment concept, what does it comprise of and how do we interact with it;
  - A description on the components and phases of the specific renewable power generation facility;
  - A general account of how the facility and its associated activities can affect the environment, giving rise to what are called environmental impacts;

- A discussion on what staff can do in order to help prevent the negative environmental impacts from degrading the environment i.e., environmental impact management.

- **Job Specific Training:** Job specific training programmes will be developed as and when required. The programs will be based on the significant environmental and social aspects/ impacts that are identified during regular audits and site inspections. Supervisory staff will be equipped with the necessary knowledge and information to guide their employees on environmental and social aspects applicable to performing a specific task.
- **Competency Training:** The Environmental Officer will be responsible for the environmental and social competency and awareness training of Middle Management and supervisors. This training will be performed both on a one-on-one basis and through workshops and presentations. Competence and the effectiveness of training and development initiatives will be determined through the following methods:

  - Trend analysis of incidents reported; and
  - Analysis of work areas during visits and audits.

  The process to declare competency of personnel is documented in the ISO9001:2000 procedure. This plan will be amended periodically in light of operational changes, learning experienced during its implementation and other activities that can affect the risk profiles.
- **Training Records**: Training can be done either in a written or verbal format but will be in an appropriate format for the receiving audience. Persons having received training must indicate in writing that they have indeed attended a training session and have been notified in detail of the contents and requirements of the EMPr. The attendance registers must be kept on file.

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place. **Table 5-2** indicates the minimum requirements as set out in the generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity.

Table 5-2 - Documentation Reporting and Compliance Requirements as per the generic EMPr

Aspect	Refer to Generic EMPr (Part A)
Document control/Filing system	Section 4.1
Documentation to be available	Section 4.2
Weekly Environmental Checklist	Section 4.3
Environmental site meetings	Section 4.4
Required Method Statements	Section 4.5
Environmental Incident Log (Diary)	Section 4.6
Non-compliance	Section 4.7
Corrective action records	Section 4.8
Photographic record	Section 4.9

Aspect	Refer to Generic EMPr (Part A)
Complaints register	Section 4.10
Claims for damages	Section 4.11
Interactions with affected parties	Section 4.12
Environmental audits	Section 4.13
Final environmental audits	Section 4.14

Refer to: Part A, Section 4 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix E.

5.3 MONITORING

The internal ESCO will monitor the day-to-day site activities on an ongoing basis and will produce weekly monitoring reports during construction. The independent, external ECO will undertake monthly audits to ensure compliance with the EMPr and conditions of the environmental authorisation during the construction activities and will report to the Site Manager should any non-compliance be identified or corrective action deemed necessary.

During the operational phase, the Holder of the EA will establish, implement and maintain a procedure to monitor and measure, on a regular basis, the key characteristics of the operations that may have a significant environmental impact. The procedure shall include the documenting of information to monitor performance, applicable operational controls and conformity with the operation's environmental objectives and targets.

The Holder of the EA will ensure that all instruments and devices used for the measurement or monitoring are calibrated and appropriately operated and maintained. Calibration records must be kept on site or in close proximity to the equipment for ease of availability.

All the conditions outlined in the EMPr (**Section 6**) will be subject to required internal day-to-day monitoring and external compliance monitoring. Where required, any specific additional monitoring has been outlined in the EMPr (**Section 6**).

5.4 NON-CONFORMANCE AND CORRECTIVE ACTION

The auditing of the construction and operational activities may identify non-conformances to the EMPr and conditions of the EA. Non-conformances may also be identified through incidents, emergencies or complaints recorded. In order to correct non-conformances, the source must be determined, and corrective actions must be identified and implemented.

5.4.1 COMPLIANCE WITH THE EMPR AND CONDITIONS OF THE ENVIRONMENTAL AUTHORISATION

- A copy of the EMPr and conditions of the environmental authorisation will be available onsite at all times for the duration of the construction and operational activities;
- All persons employed by a contractor or their sub-contractors will abide by the requirements of the EMPr and conditions of the environmental authorisation;

- Any members of the workforce found to be in breach of any of the specifications contained within the EMPr and conditions of the environmental authorisation may be ordered by the Site Manager to leave the site. A contractor will not direct a person to undertake any activity which would place them in contravention of the specifications contained within the EMPr and conditions of the environmental authorisation;
- Should a contractor be in breach of any of the specifications contained in the EMPr and conditions of the environmental authorisation, the Site Manager will, in writing, instruct the contractor responsible for the incident of non-compliance regarding corrective and/or remedial action required, specify a timeframe for implementation of these actions, implement a penalty and/or indicate that work will be suspended should non-compliance continue;
- Should non-compliance continue, further written notification will be forwarded to the contractor responsible for the incident of non-compliance outlining the required corrective and/or remedial action, the timeframe for implementation, penalties and/or work will be suspended as specified previously; and
- Departmental officials will be given access to the property referred to in the EIR and EMPr for the purpose of assessing and/or monitoring compliance with the EMPr and conditions of the environmental authorisation, at all reasonable times.

5.4.2 SPOT FINES

The ESCO and ECO shall be authorised to impose spot fines for any of the transgressions detailed below:

- Littering on site;
- Lighting of illegal fires on site;
- Any persons, vehicles or equipment related to the contractor's operations found within the designated 'no-go' areas (especially for significant cultural resources such as nearby graves etc.);
- Creating excessive dust or excess noise emanating from site;
- Possession or use of intoxicating substances or weapons on site;
- Trapping, hunting or trading of fauna and / or plants on site;
- Any vehicles being driven in excess of designated speed limits;
- Any farm gates being left open;
- Unauthorised removal and/or damage to fauna, flora or cultural or heritage objects on site; and
- Urination and defecation anywhere other than using the toilet facilities that have been provided.

These activities, along with the appropriate guidelines to determining the fines, shall be agreed to by the Holder of the EA, the Site Manager and the Contractor. Such fines will be issued in addition to any remedial costs incurred as a result of non-compliance with the environmental specifications and or legal obligations. Phefumula Emoyeni One will inform the contractor of the contravention and the amount of the fine.

It is important to note that fines can be issued on an organisational level, as well as at an individual level. These fines will be paid to an organisation as discussed and agreed to by the Holder of the EA, Site Manager, Contractors, ESCO and ECO. Proof of payment is to be provided to the EO within 30 days of the fine being issued. Payment of a fine may not be subtracted from any moneys owed to the contractor by the client. A fine is not deemed a cost saver to the client but a measure to ensure that all construction activities are undertaken in a manner that reduces further environmental damage.

5.4.3 PENALTY FINES

Where environmental damage is caused or a pollution incident, and/or failure to comply with any of the environmental specifications contained in the EMPr, the Contractor shall be liable to pay a penalty fine. The following transgressions should be penalised:

- Hazardous chemical/oil spill;
- Damage to sensitive environments;
- Damage to cultural and historical sites;
- Unauthorised removal/damage to indigenous trees and other vegetation, particularly in identified sensitive areas;
- Uncontrolled/unmanaged erosion;
- Unauthorised blasting activities; and
- Violation of environmental authorisation conditions.

These activities, along with the appropriate guidelines to determining fines, shall be agreed to by the Holder of the EA, the Site Manager and Contractor. The fines will be calculated on a severity basis and imposed as per the merits of the case. In addition to penalties, the Site Manager has the power to remove from site any person who is in contravention of the EMPr, and if necessary, the engineer can suspend part of or all the works, as required.

5.4.4 DUTY OF CARE

Under Section 28 of the NEMA, all personnel involved with the construction and operational activities onsite will be responsible for implementing measures to prevent pollution or degradation of the environment from occurring, continuing or recurring. Failure to comply with the above conditions is a breach of the duty of care. If such harm is unavoidable, steps must be taken to minimise and rectify such pollution or degradation of the environment.

5.5 DOCUMENTATION AND REPORTING

The following documentation must be kept onsite in order to record compliance with the EMPr and conditions of the environmental authorisation:

- Record of complaints; and
- Record of emergencies and incidents.

The contractor will be required to report on the following:

- Environmental incidents involving contractor/ employees and/or the public;
- Environmental complaints and correspondence received from the public; and
- Incidents that cause harm or may cause harm to the environment.

The above records will form an integral part of the ESCO and ECO's reports and records thereof maintained for the duration of the project. These records will be kept with the EMPr and conditions of the EA, and will be made available for scrutiny if so requested by the Site Manager or his delegate, the ESCO and the ECO.

The contractor will ensure that the following information is recorded for all environmental complaints/incidents/emergencies:

- Date of complaint/incident/emergency;
- Location of complaint/incident/emergency;

- Nature of complaint/incident/emergency;
- Causes of complaint/incident/emergency;
- Party/parties responsible for causing complaint/incident/emergency;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident/emergency;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident/emergency;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented; and
- Copies of all correspondence received regarding complaints/incidents/emergency.

5.6 METHOD STATEMENTS

Before the contractor begins each construction activity, the contractor shall give to the ESCO and Site Manager a written Method Statement setting out the following:

- The type of construction activity;
- Locality where the activity will take place;
- Identification of impacts that might result from the activity;
- Identification of activities or aspects that may cause an impact;
- Methodology and/or specifications for impact prevention for each activity or aspect;
- Methodology and/or specifications for impact containment for each activity or aspect;
- Emergency/disaster incident and reaction procedures; and
- Treatment and continued maintenance of impacted environment.

The contractor must provide such information at least two weeks in advance of any or all construction activities for review and approval. Any changes made to the Method Statement after approval shall be given to the ESCO for review and the Site Manager for approval.

The ESCO and/or Site Manager may provide comment on the methodology and procedures proposed by the contractor but shall not be responsible for the contractor's chosen measures of impact mitigation and emergency/disaster management systems.

5.7 PUBLIC COMPLAINTS

The Contractor shall keep a Complaints Register on site to allow the general public to document any comments on or complaints regarding the activities of the site.

The Complaints Register must:

- Have numbered pages – any missing pages must be accounted for by the Contractor;
- Be tabled during monthly site meetings;
- Be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested; and
- Include a section for the documentation of the action taken to address the complaint.

All complaints must be investigated, responded to, and recorded in the Complaints Register within 28 calendar days.

A generic grievance mechanism is detailed in **Section 8.15**.

5.8 ADAPTIVE MANAGEMENT

The mitigation measures outlined in this EMPr will be implemented as required. However, as data is collected during the operational phase of the WEF and as mitigation technologies advance, the mitigation measures will be adapted accordingly to ensure that the most appropriate and cost effective mitigation is implemented throughout the WEF's life-cycle.

It is recommended that the operational component of the EMPr is reviewed at least every five years, as it relates to avifaunal monitoring. The review of the EMPr must include stakeholder consultation.

6 GENERIC ENVIRONMENTAL CONTROLS

This section refers to construction related activities that are common to the development of the substations associated with Phefumula Emoyeni One WEF as defined within the pre-approved generic EMPrs. For each activity, a set of prescribed environmental controls and associated management actions have been identified. Contractors shall implement these controls as a minimum requirement for mitigating the impact of particular construction related activities.

These control measures are defined within Part B: Section 1 of the pre-approved generic EMPr (attached as **Appendix E**). The format of a general environmental control is shown below, see **Table 6-1**. The boxes shaded in green are predefined and represent minimum standards for the management of that particular aspect. The Contractor will be required to adhere to all impact management actions (where applicable to the construction related activity) for the Project. The boxes shaded in red assign responsibility for the implementation and monitoring of the impact management actions. This implementation and monitoring information is project specific and shall be completed by the Contractor prior to commencement of construction.

Table 6-1 – Format of a general environmental control illustrating aspects which are predefined versus those which still need to be completed by the contractor

Management Objective:	Predefined as part of Generic EMPr					
Management Outcome:	Predefined as part of Generic EMPr					
Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
Predefined as part of Generic EMPr	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor	To be completed by Contractor

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements must prepared and agreed to by the holder of the EA, prior to commencement, and must be appended to the template. Each method statement must also be duly signed and dated on each page by the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

The construction related activities addressed within Part B: Section 1 of the pre-approved generic EMPrs are as follows:

Table 6-2 - Activities and management measures as per generic EMPr (Part B: Section 1)

Activity	Refer to Generic EMPr for the development and expansion of substation infrastructure, attached as Appendix E (Part B: Section 1)
Environmental awareness training	5.1
Site Establishment development	5.2
Access restricted areas	5.3
Access roads	5.4
Fencing and Gate installation	5.5
Water Supply Management	5.6
Storm and wastewater management	5.7
Solid and hazardous waste management	5.8
Protection of watercourses and estuaries	5.9
Vegetation clearing	5.10
Protection of fauna	5.11
Protection of heritage resources	5.12
Safety of the public	5.13
Sanitation	5.14
Prevention of disease	5.15
Emergency procedures	5.16
Hazardous substances	5.17
Workshop, equipment maintenance and storage	5.18
Batching plants	5.19
Dust emissions	5.20
Blasting	5.21
Noise	5.22
Fire prevention	5.23
Stockpiling and stockpile areas	5.24
Finalising tower positions	5.25

Activity	Refer to Generic EMPr for the development and expansion of substation infrastructure, attached as Appendix E (Part B: Section 1)
Civil works	5.25
Excavation (and Installation) of foundations	5.26
Installation of foundations, cable trenching and drainage systems	5.27
Assembly and erecting towers	5.25
Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)	5.28
Stringing (and cabling)	5.30
Testing and Commissioning (all equipment testing, earthing system, system integration)	5.31
Socio-economic	5.32
Temporary closure of site	5.33
Dismantling of old equipment	5.34
Landscaping and rehabilitation	5.35

Refer to: Part B – Section 1 of the Generic EMPr for the development and expansion of substation infrastructure for the transmission and distribution of electricity, attached as Appendix E.

7 SITE SPECIFIC ENVIRONMENTAL CONTROLS

The EMPr contains guidelines, operating procedures, rehabilitation and pollution control requirements which will be binding to the onsite personnel working for, or on behalf of Phefumula Emoyeni One WEF. It is essential that the EMPr be carefully studied, understood, implemented and adhered to at all times.

In instances where the method statements provided by the contractor conflict with the EMPr, such conflicts will be discussed between the Site Manager, ESCO, ECO and contractor and if unresolved the EMPr will take precedent.

The EMPr identifies various actions which are undertaken throughout the construction and operational phases of the Phefumula Emoyeni One WEF. Not every action will be required during the entire course of activities. Therefore, the actions identified in the EMPr have been given priority timeframes for proposed implementation. The columns in the structure of the EMPr have been described **Table 7-1** below.

Table 7-1 – Structure of EMPr

Column	Description
Activity/Aspect	Highlights the various activities/aspects associated with the project i.e. the contractors' activities that will interact with the environment.
Impact Management Outcome	The desired outcomes from effectively minimising negative impacts and/or enhancing positive impacts.
Impact Management Actions/Measures	Indicates the actions required to prevent and /or minimise the potential impacts on the environment that are associated with the project.
Indicator and Compliance Management	Items that will assist with determining compliance against management actions.
Responsibility	Indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Please note that the Site Manager will have authority to stop works if/as necessary.
Priority Timeframe	Indicates when the actions for the specific aspect must be implemented and/or monitored.

Table 7-2 – Contractor laydown area and site access: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.1 CONTRACTOR LAYDOWN AREA AND SITE ACCESS			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Induction training and register. ▪ Environmental awareness programme/toolbox talks.			
Project Initiation of Construction Activities	Appoint an ECO to manage and verify compliance with the EA and EMPr.	▪ Holder of the EA ▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Pre-Construction ▪ Construction ▪ Decommissioning
	The development footprint must be demarcated to ensure that only the demarcated areas are impacted upon. The no-go areas identified must be demarcated before the construction or decommissioning commences. This includes all wetlands and the associated buffers, and any high sensitivity areas. Label these areas as environmentally sensitive areas, keep out.		
	Contractor laydown areas, vehicle re-fuelling areas and material storage facilities to remain outside of the delineated freshwater ecosystems and the associated NEMA 32m.		
	All personnel and contractors to undergo Environmental Awareness Training, including awareness of the surrounding area and wetlands to		▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	inform importance of these areas and their conservation. A signed register of attendance must be kept for proof.		▪ Operation
	Site clearing must be limited to the footprint of the infrastructure requirements.		▪ Construction
	Locate firefighting measures at laydown areas and vehicles, such as fire extinguishers, and make personnel aware of fire prevention and firefighting measures.		
	Firefighting equipment must be securely placed and inspected monthly.		

Table 7-3 – Vehicle, Equipment and Machinery Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.2 VEHICLE, EQUIPMENT AND MACHINERY MANAGEMENT			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from poorly maintained equipment, machinery and vehicles onsite.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Transport route delineation. ▪ Daily equipment, machinery and vehicle checklists. ▪ Incident classification and reporting procedure.			
Operation of Equipment, Machinery and Vehicles	Ensure that the equipment, machinery and vehicles are adequately maintained so as to: ▪ Reduce the potential for spillages of oil, diesel, fuel or hydraulic fluid. ▪ Ensure road-worthiness. ▪ Reduce emissions. Evidence of such maintenance must be recorded and maintained onsite for verification.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	Maintenance vehicles should stick to demarcated roads as far as practically possible to minimise soil compaction on adjacent soils.		
	The movement of vehicles into and out of the site must be managed to ensure the impact on public areas is minimised, such as ensuring that abnormal loads are moved outside of peak traffic hours, and reasonable measures are taken to ensure that public and staff safety is managed adequately.		

Table 7-4 – Fuel and Chemical Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.3 FUEL AND CHEMICAL MANAGEMENT			
Impact Management Outcome: ▪ To ensure the correct storage, handling and disposal of fuels and chemicals in order to prevent impacts to the surrounding environment.			
Indicator and Compliance Mechanism: ▪ Maintenance records. ▪ Safe disposal certificates (if applicable). ▪ Material safety data sheets (MSDS). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Chemicals management procedure (to be developed). ▪ Monitoring and audit reports. ▪ Training records.			
Fuel and Chemical Management	Provide secure storage for fuel, oil, chemicals and other hazardous materials. Securely fence and lock the storage areas to accommodate all hazardous substances such as fuel, oils and chemicals. The storage area must be roofed and the floor must be an impermeable surface and suitably bunded as per the requirements outlined in South African National Standard (SANS) 10089-1 (2008). If storage capacity triggers licencing, those must be acquired.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Indicate the location of the fuel and chemical storage area on the layout plans.		
	Label all liquids (chemicals and hydrocarbons) stored onsite for easy identification. MSDS for onsite chemicals, hydrocarbon materials and hazardous substances must be readily available. MSDS must include mitigation measures to ameliorate potential environmental impacts which		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	may result from a spill, incorporating health and safety mitigation measures.		
	A spill management plan must be in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use.		
	No servicing of equipment on site unless necessary. All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers for safe disposal.		
	In cases where a surface leak occurs during loading and off-loading activities, the spill material will be cleaned using a spill kit.		
	Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair		
Health and Safety	Display “no smoking” and “no naked flame” signs in and around the project area, as well as near the hazardous material store.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Strategically place the correct types of fire extinguishers onsite and near the hazardous material store. Train key personnel on basic firefighting skills		
	Frequently inspect and maintain containment facilities and retain records onsite.		

Table 7-5 – Waste Management: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.4 WASTE MANAGEMENT			
Impact Management Outcome: ▪ To ensure the correct handling, storage, transportation and disposal of general waste and hazardous waste.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Waste Management Plan (WMP). ▪ Relevant SANS Codes of Practice. ▪ Waste manifests and safety disposal certificates (all waste streams). ▪ Emergency preparedness and response procedure. ▪ Incident classification and reporting management procedure (to be developed). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports.			
General Waste Management	General waste generated because of construction and operational activities must be managed in accordance with a WMP (See Generic WMP in Section 8.2).	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	Train and inform all onsite personnel regarding general waste minimisation, management and disposal as per the WMP.		
	Prohibit littering, burning and burying of waste onsite.		
	Place an adequate number of labelled or colour coded general waste bins around the laydown area and at the construction sites during construction activities to minimise littering. The bins must be removed from the site on a regular basis for disposal at a registered or licensed disposal facility.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Waste management must be a priority and all waste must be collected and stored adequately. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site.		
	Refuse bins shall be emptied daily (or as required) and secured.		
	Temporary storage of domestic waste shall be in covered waste skips.		
	Maximum domestic waste storage period shall be 10 days.		
	Retain records such as waybills and waste manifests associated with waste removal, transportation and disposal (safe disposal certificates).		
	Prohibit the mixing of general waste with hazardous waste. Should general waste be mixed with hazardous waste, it will be considered hazardous waste. There should be waste segregation (e.g. electronic equipment, chemicals, oil contaminated rags, paper, plastic) and management on the site.		
	Recover, recycle and reuse general waste as far as possible.		
Hazardous Waste Management	Hazardous waste generated as a result of construction, operational and decommissioning activities must be managed in accordance with a WMP that is aligned to South African National Standard (SANS) 10234: Classification and Labelling of Chemicals – SANS 10228: The Identification and Classification of Dangerous Substances – SANS 10229: Packing of Dangerous Goods for Road and Rail Transportation.	▪ ESCO / ECO ▪ EO ▪ Contractor	▪ Construction ▪ Operation ▪ Decommissioning
	The WMP must include a procedure for handling spillages.		
	Strict use and management of all hazardous materials used on site.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Strict management of potential sources of pollution (e.g. litter, hydrocarbons from vehicles & machinery, cement during construction, etc.) within demarcated / bunded areas.		
	Train and inform all onsite personnel regarding hazardous waste minimisation, management and disposal as per the WMP.		
	A designated and appropriately demarcated and covered hazardous waste storage area must be established on a hard standing area.		
	Ensure that all hazardous wastes temporarily stored on site are stored in a covered skip and are placed on a hard standing.		
	Clean areas where hazardous waste spills have occurred and dispose of the hazardous material appropriately. Key personnel must be trained on handling spillages.		
	Retain records of appropriate safety disposal certificates associated with hazardous waste removal, transportation and disposal.		
	An emergency preparedness and response plan is to be developed by the contractor/operator for any hazardous waste being removed, transported and disposed of offsite.		
	Ensure that waste manifest documentation (as per the Waste Classification and Management Regulations – GNR 634) is prepared and maintained for the generation, transportation and disposal of waste.		
	All spills should be reported to the authorities as per the emergency preparedness and response frequencies / specifications.		

Table 7-6 – Health and Safety: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.5 HEALTH AND SAFETY			
Impact Management Outcome: ▪ To ensure communication with members of the public to promote safety awareness. ▪ To prevent public access to construction sites and storage areas. ▪ To ensure safety for all onsite personnel.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed).			
Health and Safety	The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993, specifically the Construction Regulations.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	All onsite personnel are required to undergo induction training and regular toolbox talks in order to raise awareness of the conditions contained herein.		
	Development and implementation of an occupational health and safety plan and Safety Health Environment Risk & Quality (SHERQ) policy.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	The appointed contractor will be responsible for the development of a comprehensive health and safety protocol which must be adhered to.	▪ Contractor	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers.		
	Provide and wear appropriate PPE onsite.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	All normal procedures for working at heights, hot work permits, confined space entry, cordon off excavations etc to be in place before construction begins.	▪ Contractor/Operator ▪ Site Manager	▪ Construction ▪ Operation
	All necessary good hygiene practices to be in place, e.g. provision of toilets, eating areas, infectious disease controls.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.		
	Prior to construction, determine the dangerous species in the area and what responses are needed to bites/exposure/attacks.		
	Train all onsite personnel handling chemical or hazardous substances in the use of such substances and the environmental, health and safety consequences of incidents.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Outside work must be stopped during thunderstorms. Lighting conductors may be required for the final installation, to be confirmed during design phase.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Facility emergencies	Emergency response plan for full operation and maintenance phase to be in place prior to beginning commissioning and to include aspects such as: ▪ appointment of emergency controller,	▪ Operator	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ emergency isolation systems for electricity, ▪ emergency isolation and containment systems for electrolyte, ▪ provision of PPE for hazardous materials response, ▪ provision of emergency facilities for staff at the main office building, ▪ provision of first aid facilities, ▪ first responder contact numbers etc		
	A detailed risk assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.	▪ Operator	▪ Operation
	Material Safety Data Sheets (MSDSs) must be made available for all chemicals and substances on site.	▪ Site Manager ▪ Contractor ▪ Operator ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Fire risk	Full Process Safety Management system with all elements to be implemented to highest international best practice levels.	▪ Site Manager ▪ Contractor ▪ Operator ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	Suitable fire-fighting equipment on site near source of fuel, e.g. diesel tank, generators, mess, workshops etc.		
	Safety integrity level rating of equipment (failure probably) with suitable redundancy if required.		
	Ensure regular testing of emergency alarm systems are undertaken.		
	Emergency Response plan in compliance with SANS 1514 to be compiled, e.g. plan from transport and construction phase to be extended to operational phase to include the hazards of the systems containing large quantities of highly hazardous chemicals.		
Public Safety	Restrict public access by employing full time security for the site.	▪ Site Manager	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
		▪ ESCO / ECO ▪ EO	▪ Operation
Decommissioning of facility	End of Life shutdown procedure including a risk assessment of the specific activities involved.	▪ Operator ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	Re-purpose the equipment with associated environmental impact considered.		
	Disposal according to local regulations and other international directives.		
	Operator should seek the opinion from a waste consultant on how to correctly dispose of hazardous waste.		

Table 7-7 – Air quality: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.6 AIR QUALITY			
Impact Management Outcome: ▪ To ensure that impacts to air quality of the surrounding environment are minimised.			
Indicator and Compliance Mechanism: ▪ Complaints register. ▪ Incident reporting system. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Equipment, machinery and vehicle maintenance.			
Dust Management	Before the commencement of any site works and during the operation, as much vegetation as possible must be retained, including patches and strips to minimise dust.	▪ EO ▪ ESCO / ECO ▪ Contractor	▪ Construction ▪ Operation
	Activities with high dust-causing potential, such as grading and moving of soil, must not be carried out in sensitive areas during adverse wind conditions.		▪ Construction
	All stockpiles (if any) must be restricted to designated areas and may not exceed a height of two (2) metres.		
	Earth-moving works have the potential to generate large amounts of dust. Pre-planning of earth-moving works can reduce dust emissions by limiting the time the site is exposed. Options for dust control can include the following: ▪ Plan earth-moving works so that they are completed just prior to the time they are needed		

	▪ Observe weather conditions and do not commence or continue earth moving works if conditions are unsuitable e.g., under conditions of strong winds ▪ Reduce off-site hauling via balanced cut and fill operations ▪ Pre-water areas to be disturbed		
	Cover and/or maintain appropriate freeboard on trucks hauling any loose material that could produce dust when travelling. Minimise transfer points.		
	Re-vegetate disturbed areas as soon as possible to prevent excessive dust from occurring.		
	Once construction is complete, initiate rehabilitation (e.g. re-vegetation) procedures to reduce wind speed across exposed surfaces.		
	Dampen exposed soil to suppress dust if required. Use watering sprays on materials to be loaded and during loading.		
	Where possible, minimise speed limits, vehicle weights and the number of vehicles using unpaved roads.		

Table 7-8 – Noise: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.7 NOISE			
Impact Management Outcome: ▪ To ensure that noise impacts to the surrounding environment are minimal or mitigated.			
Indicator and Compliance Mechanism: ▪ Complaints register. ▪ Incident reporting system. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Equipment, machinery and vehicle maintenance.			
Noise	Applicant to re-evaluate the noise impact should the applicant make use of a wind turbine with a maximum SPL exceeding 109.0 dBA re 1 pW	▪ Applicant/ECO	▪ Planning phase
	Applicant to re-evaluate the noise impact once the WTG specifications are finalised, and should the WTG layout be revised as part of an amendment process post EA. If noise modelling indicates noise levels exceeding 45 dBA (day and night) at verified NSR (where the structures are used for permanent residential activities), the applicant must design a NAP (or appropriate mitigation measures) that will ensure that operational noise levels are less than 45 dBA is at all potential NSR.		
	Applicant to design and implement noise monitoring programme to define current ambient sound levels at selected NSR before the construction phase starts.		
	When working near a potential sensitive receptor, limit the number of simultaneous activities to a minimum as far as possible		
	Engineering, procurement and construction (EPC) contractor to ensure that equipment is well maintained and fitted with the correct and appropriate noise abatement measures.	▪ EPC contractor / ECO	▪ Construction

	Health & Safety ("H&S") agent/ ECO to include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about the potential impact from noise.	▪ H&S Agent/ ECO	▪ Construction
	EPC contractor (responsible person to be defined by client) to notify NSR before night-time construction activities are to take place within 1,000 m from NSR (if the structures are used for residential activities during the proposed construction period).	▪ EPC contractor/ ECO	▪ Construction (activities within 1500m from NSR, if NSR is used for residential purposes)
	Facility manager to conduct noise monitoring when a reasonable and valid noise complaint is received from an NSR living within 2,000 m from a WTG of the project.	▪ Contractor/ Operator/ Facility Manager	▪ Operation: Within 2 months after a noise complaint is registered
	Operating turbines in reduced noise mode should any complaints be received.	▪ Contractor/ Operator/ Facility Manager	▪ Operation
	Limiting turbine operations above the wind speed at which turbine noise becomes unacceptable in the project-specific circumstances.	▪ Contractor/ Operator/ Facility Manager	▪ Operation
	Noise monitoring to confirm that noise levels associated with operating WTG are less than 45 dBA at all NSR.	▪ Contractor/ Operator/ Facility Manager	▪ Operation: During the first year. Noise specialist to confirm need for future measurements

Table 7-9 – Soil, Land Use and Agriculture: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.8 SOIL, LAND USE AND AGRICULUTURE			
Impact Management Outcome: ▪ To prevent any disturbance, erosion or contamination of soil resources.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ WMP (to be developed). ▪ Incident classification and reporting management procedure (to be developed). ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Stormwater Management Plan (SWMP) (to be developed).			
Soil and Land Management	A system of storm water management, which will prevent erosion on and downstream of the site, will be an inherent part of the engineering 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.	▪ Site Manager ▪ Contractor ▪ Developer ▪ ESCO / ECO ▪ EO	▪ Pre-Construction
	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 30 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 remains 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		

Table 7-10 – Aquatic Biodiversity: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.9 AQUATIC BIODIVERSITY			
Impact Management Outcome: ▪ Prevent the unnecessary destruction of, and fragmentation of the aquatic biodiversity of the area. ▪ No excess aquatic habitat within the area. ▪ Prevent contamination of wetlands.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
River water quality	▪ Limit vegetation removal to the infrastructure footprint area only. Where removed or damaged, vegetation areas (riparian or aquatic related) should be revegetated as soon as possible.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
	▪ The freshwater ecosystems outside the construction footprint not having authorised road crossings must be considered as no-go areas. No construction vehicles, nor construction personnel or vehicles may traverse through these freshwater ecosystems (except on approved road crossings).		
	▪ All construction areas must be clearly demarcated prior to the start of site clearing to prevent any accidental clearing of vegetation or construction impacts from adversely impacting areas outside of the development footprint (layout).		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ A designated contractor laydown area(s) that is located outside the freshwater ecosystems and outside of a 100m buffer of any wetland should be approved by the Environmental Control Officer (ECO) prior to use		
	▪ All construction and site clearing should ideally take place during the dry season to limit potential impacts to downgradient freshwater ecosystems because of construction activities		
	▪ Bare land surfaces downstream of construction activities must be vegetated to limit erosion from the expected increase in surface runoff from infrastructure.		
	▪ Environmentally friendly barrier systems, such as silt nets or, in severe cases, use trenches downstream from construction sites to limit erosion and possibly trap contaminated runoff from construction.		
	▪ Storm water must be diverted from the construction site and managed in such a manner to disperse runoff and prevent the concentration of storm water flow.		
	▪ Water used at construction sites should be utilised in such a manner that it is kept on site and not allowed to run freely into nearby watercourses.		
	▪ Construction chemicals, such as cement and hydrocarbons should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ All vehicles must be frequently inspected for leaks.		
	▪ All vehicle re-fuelling is to take place in specifically designated re-fuelling areas that must be located outside of a 100m buffer of wetlands		
	▪ No material may be dumped or stockpiled within any rivers or drainage lines in the vicinity of the proposed Project, and must be removed immediately without destroying habitat.		
	▪ All waste must be removed and transported to appropriate waste facilities.		
	▪ As far as possible, existing roads must be utilised to gain access to construction sites.		
	▪ High rainfall periods (usually November to March) should be avoided during the construction phase to possibly avoid increased surface runoff in attempt to limit erosion and the entering of external material (i.e. contaminants and/or dissolved solids) into associated aquatic systems.		
	▪ Runoff from the Project area should not be allowed to flow into the nearby watercourses, unless authorised by the DWS (or the competent authority).		
	▪ Careful monitoring of the areas where dust suppression is proposed should be undertaken regularly.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Biannual aquatic biomonitoring assessments of the associated water courses should be conducted by an aquatic specialist to determine impacts, whereafter new mitigation actions should be implemented as per the specialist's recommendations.		
	▪ The construction footprint must be limited to a construction 10m wide construction Right of Way.		
	▪ Bare surfaces downstream from the developments, where silt traps are not an option, should be well vegetated in order to attempt to limit erosion and runoff that might be carrying contaminants.		
Transformation of freshwater vegetation, associated habitat and ecosystem services within freshwater ecosystems not proposed to be directly impacted from indirect impacts; Transportation of construction materials can result in disturbances to soils, and increased risk of sedimentation/erosion; Risk of AIP proliferation in disturbed areas that could colonise the adjacent wetland areas; and Soil and stormwater contamination from oils	▪ It is recommended that Turbine 42 be relocated to the north to be located outside of the 15m non-development buffer of the seep wetland to the south as a minimum.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ All construction areas must be clearly demarcated prior to the start of site clearing to prevent any accidental clearing of vegetation or construction impacts from adversely impacting areas outside of the development footprint (layout).		
	▪ A designated contractor laydown area(s) that is located outside the freshwater ecosystems and outside of a 100m radius of any wetland should be approved by the Environmental Control Officer (ECO) prior to use;		
	▪ An ECO must be appointed in order to ensure all water related aspects are adequately mitigated for the duration of the construction phase;		
	▪ All development footprint areas to remain within the approved development footprint and vegetation clearing to be limited to what is essential within those approved footprints		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
and hydrocarbons originating from construction vehicles.	▪		
	▪ All construction and site clearing should ideally take place during the dry season to limit potential impacts to ▪ downgradient freshwater ecosystems as a result of construction activities;		
	▪ Where clearing of vegetation at a large scale is to be undertaken, no large-scale indiscriminate clearing of vegetation from the entire footprint must be undertaken. Rather blocks of vegetation must be systematically cleared of vegetation to avoid the creation of large volumes of dust and to control stormwater runoff during construction;		
	▪ All vegetation removed as part of the site clearing activities (specifically where large areas need to be cleared) must be transported from the construction site (may not be stockpiled) and disposed of at a registered waste disposal facility;		
Transformation of freshwater vegetation, associated habitat and ecosystem services within downgradient freshwater ecosystems related to indirect impacts, including hydrological alteration due to stormwater discharges, increased erosion or development of new erosion, and deposition of increased sediment from dust or transported by stormwater;	▪ During construction of the surface infrastructure regular spraying of non-potable water or the use of chemical dust suppressants, that are approved for use near freshwater ecosystems must be implemented to reduce dust and to ensure no smothering of vegetation within the freshwater ecosystems occurs from excessive dust settling. It is recommended that a suitably qualified specialist be consulted for approval of the product and conditions for use;		
	▪ As soon as areas of vegetation are cleared, construction-phase stormwater controls must be implemented on the downgradient side of the cleared areas to mitigate the risk of stormwater transporting sediment towards wetlands;		
	▪ The freshwater ecosystems outside the construction footprint not having authorised road crossings must be considered as no-go		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Transportation of construction materials can result in disturbances to soils, increased risk of sedimentation/erosion and dust generation; and Soil and stormwater contamination from oils and hydrocarbons originating from construction vehicles. Risk of AIP proliferation in disturbed areas that could colonise the adjacent wetland areas.	areas. No construction vehicles, nor construction personnel or vehicles may traverse through these freshwater ecosystems (except on approved road crossings); ▪ As far as possible, existing roads must be utilised to gain access to construction sites; ▪ All vehicle re-fuelling is to take place in specifically designated re-fuelling areas that must be located outside of a 100m radius of wetlands.		
Destruction of a certain area of wetland habitat in the footprint of the turbine and hardstand; Earthworks and exposure of soil could result in sedimentation of the downstream wetland, which may be transported as runoff into the downstream freshwater ecosystem areas and may smother vegetation associated with the freshwater ecosystems; Altered water quality (if surface water is present)	▪ It is strongly recommended that Turbine 5 be relocated so that not part of its footprint is located within the delineated wetland boundary or its associated 15m non development buffer		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
as a result of vehicle movement and construction activities; and Proliferation of alien and/or invasive vegetation as a result of disturbances.			
Earthworks and exposure of soil could result in sedimentation of downgradient wetlands, which may be transported as runoff into the downgradient wetlands and may smother wetland vegetation; Altered water quality in downgradient wetlands (if surface water is present) as a result of pollution as a result of oils (e.g. from spills) and concrete mixing; and Proliferation of alien and/or invasive vegetation as a result of disturbances.	▪ It is strongly recommended that Turbine 5 be relocated outside of the seep wetland and its affected 15m non-development buffer so that no part of its footprint affects the wetland.		
	▪ During excavation activities, the topsoil and vegetation must be stockpiled separately from other material outside the delineated extent of the freshwater ecosystems;		
	▪ Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up by any stockpiled materials. The mixture of the lower and upper layers of the excavated soil must be kept to a minimum, so as for later use as backfill material after construction has commenced;		
	▪ All exposed soils must be protected from wind using tarpaulins for the duration of the construction phase to prevent potential erosion and sedimentation of the freshwater ecosystems;		
	▪ Suitable drainage must be ensured within construction areas (including contractor laydown areas, material storage facilities, etc.) in order to ensure that water does not pond or drain in a concentrated manner into the downgradient freshwater ecosystems. Consideration must be given to ensuring that stormwater is allowed to diffusely spread across the landscape, by ensuring adequate surface roughness of the surrounding terrestrial/freshwater area;		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Earthworks and exposure of soil could result in sedimentation of downgradient wetlands, which may be transported as runoff into the downgradient wetlands and may smother wetland vegetation; Altered water quality in downgradient wetlands (if surface water is present) as a result of pollution as a result of oils (e.g. from spills) and concrete mixing; and Proliferation of alien and/or invasive vegetation as a result of disturbances. Earthworks associated with the turbine foundation and laying of sub-surface concrete would result in disturbances to sub-surface movement of water within the wetland; Earthworks could result in sedimentation of the	▪ No concentrated runoff from the surface infrastructure construction areas must enter the freshwater ecosystems. This must be achieved by installing silt traps or placing hay bales downgradient of the construction footprint (until suitable basal vegetation cover has been restored) to ensure no sediment laden or concentrated runoff generates from the construction footprint ▪ It is highly recommended that an alien vegetation management plan be compiled during the planning phase and implemented concurrently with the commencement of construction. ▪ Concrete and cement-related mortars can be toxic to aquatic life. Proper handling and disposal must minimise or eliminate discharges into the freshwater ecosystems. High alkalinity associated with cement, can dramatically affect and contaminate both soil and ground water. ▪ Fresh concrete and cement mortar must not be mixed near the freshwater ecosystems. Mixing of cement may be done within the construction camp, however, may not be mixed on bare soil, and must be within a lined, bound or bunded portable mixer. Consideration must be given to the use of ready mix concrete; ▪ No mixed concrete may be deposited directly onto the ground within the freshwater ecosystems (outside of the designated area) or associated riparian habitat. A batter board or other suitable platform/mixing tray is to be provided onto which any mixed concrete can be deposited whilst it awaits placing; ▪ A washout area must be designated outside of the freshwater ecosystems, and wash water must be treated on-site or discharged to a suitable sanitation system;		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
downstream wetland, which may smother wetland vegetation; Altered water quality (if surface water is present) as a result of spills associated with vehicles or other construction activities, especially concrete mixing; and Proliferation of alien and/or invasive vegetation as a result of disturbances.	▪ Cement bags must be disposed of in the demarcated hazardous waste receptacles and the used bags must be disposed of through the hazardous substance waste stream; ▪ Spilled or excess concrete must be disposed of at a suitable landfill site. Chain of custody documentation must be provided ▪ Stockpiled material must be used as backfill material; ▪ All excavated areas must be backfilled to the natural ground level with excavated material; ▪ Soil must be suitably compacted, and all construction material must be removed from the site upon the completion of construction or used in the rehabilitation process.		
Earthworks and exposure of soil could result in sedimentation of the downstream wetland, which may be transported as runoff into the downstream wetland areas and may smother wetland vegetation; Potential spillage of pollutants such as oil and or liquified cement which could damage wetland habitat and biota; Movement of heavy machinery within the wetland adjacent to the	▪ The design of upgraded crossing structures must improve ecological and hydrological connectivity through the increased number of culverts; ▪ The construction footprint must be limited to a construction 10m wide construction Right of Way ▪ Upgrading of (informal) roads and tracks must take cognisance of the delineated extent of the freshwater ecosystem traversed by the existing informal access road and that located within close proximity to the road ▪ Material to be used (gravel – if applicable) as part of the upgrading of the existing roads / development of new crossings must be stockpiled outside the delineated extent of the freshwater ecosystems and outside the freshwater ecosystem non development buffer to prevent sedimentation thereof and to avoid any other vegetation being impacted by the construction activities.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
crossing structure which would damage wetland soils and vegetation; Proliferation of alien and/or invasive vegetation as a result of disturbances.	These stockpiles may not exceed a height of 2 m and must be protected from wind using tarpaulins		
	▪ The disturbed area surrounding the road must be revegetated with suitable indigenous vegetation to prevent the establishment of alien vegetation species and to prevent erosion from occurring		
	▪ An alien vegetation management plan must be implemented concurrently with the commencement of construction		
	▪ All existing alien and invasive vegetation must be removed. All material must be disposed of at a registered garden refuse site and may not be burned or mulched on site		
	▪ Silt controls must be implemented downstream / downgradient of the works area		
	▪ Should flows be encountered in wetlands during construction periods the construction methodology must account for this with the use of coffer dams, etc. where needed		
	▪ All mobile machinery that could leak oil must operate on a drip tray		
	▪ Vehicles involved in construction must be regularly checked for leaks and removed if found to be non-compliant and the leak immediately repaired		
Destruction of a certain area of wetland habitat in the footprint of the crossing structure;	▪ It is imperative that all construction works within the freshwater ecosystems be undertaken during dry periods when there is no flow within the freshwater ecosystems, and thus no diversion of flow would be necessary. It is also recommended that existing crossings through freshwater ecosystems be prioritised for upgrading rather than development of new crossings, where possible		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Earthworks and exposure of soil could result in sedimentation of the downstream wetland, which may be transported as runoff into the downstream wetlands and may smother wetland vegetation; Altered water quality (if surface water is present) as a result of vehicle movement and construction activities; Loss of ecological connectivity; Potential hydrological impacts associated with crossing structures, including increased saturation and ponding upstream of the crossing structure, as well as deprivation of downstream reaches of water and sediment, which may lead to erosion in the long term; and	▪ The throughflow structures must be designed to ensure that the structures are geotechnically sound and that they are hydraulically stable, even if a 1:100 year flood event was to occur. The designs must include box culverts installed intermittently to ensure a free draining landscape at various flood levels. It is recommended that a suitably qualified hydrologist be consulted to provide guidance on the relevant sizes and width requirements to ensure that the hydraulic functioning of the system is maintained and the design should be signed off by a suitably qualified freshwater ecologist		
	▪ In addition, the crossings must be designed such that they remain stable in the event of over-topping during high-flow events and do not lead to excessive downstream erosion and incision. It must be ensured that the final design accounts for appropriate wetting frequencies and patterns are maintained in the pre-development condition (with input from the freshwater ecologist, where necessary).		
	▪ The reaches of the freshwater ecosystems where no activities are planned to occur must be considered no-go ▪ area		
	▪ A 10m construction Right of Way (RoW) is proposed at road crossings that would allow for construction personnel, and equipment or vehicles (if applicable) to enter the freshwater ecosystem		
	▪ Should saturated soils be encountered within the footprint of the works area a form of running track to prevent heavy vehicles from damaging wetland substrate may need to be laid down where vehicles need to access wetland areas		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Proliferation of alien and/or invasive vegetation as a result of disturbances.	▪ The clearing of vegetation within the footprint area must be kept to a minimum to avoid unnecessary disturbance within the active channel		
	▪ The removed vegetation must be stockpiled outside of the delineated boundary of the freshwater ecosystem. The footprint areas of these stockpiles must be kept to a minimum, and may not exceed a height of 2 m. Should the vegetation not be suitable for reinstatement after the construction phase or be alien/invasive vegetation species, all material must be disposed of at a registered garden refuse site and may not be burned or mulched on site		
	▪ During the excavation activities, any soil/sediment or silt removed from the freshwater ecosystem may be temporarily stockpiled in the construction RoW but outside the delineated extent of the freshwater ecosystem.		
	▪ Stockpiles may not exceed 2m in height, and their footprint must be kept to a minimum. Stockpiling of removed materials may only be temporary (may only be stockpiled during the period of construction at a particular site) and must be disposed of at a registered waste disposal facility		
	▪ During trenching activities, seepage water may be present within the trench - invariably this will be filled with silt and be muddy. Therefore, any seepage must not be discharged straight into the river channel but through a silt trapping area first before entering the downstream reach		
	▪ Excavated materials must not be contaminated, and it must be ensured that the minimum surface area is taken up. Mixture of the lower and upper layers of the excavated soil must be kept to a minimum, for later usage as backfill material or as part of rehabilitation activities		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Excavated topsoil must be stored separately and may not be contaminated. Furthermore, the soil layers must be placed in the same order and the topsoil returned last		
	▪ Care must be taken to ensure that no scouring or erosion occurs as a result of the proposed road crossings. Installation of riprap or gabion mattresses and/or concrete aprons associated with any culverts must be included in design		
	▪ All construction material (with specific mention of prefabricated culvert structures) must be stockpiled in the laydown area and must only be imported to the construction site when required		
	▪ Construction equipment/vehicles used to install culvert structures must be parked on the existing road surface and may not enter the freshwater ecosystems		
	▪ Reno-mattresses or riprap must be installed at the outlet side of the culvert/bridge structures to ensure energy dissipation and prevent concentrated runoff into the downstream freshwater feature. The reno mattress/riprap must be installed flush with the culvert outlet		
Disturbance to soil and ongoing erosion as a result of periodic maintenance activities; and Altered water quality (if surface water is present) as a result of increased availability of pollutants.	▪ No indiscriminate movement of maintenance equipment or vehicles through the freshwater ecosystems may be permitted during standard operational activities or maintenance activities. Use must be made of the existing road crossings only		
	▪ Unnecessary disturbances surrounding the perimeter of the surface infrastructure must be avoided		
	▪ Vehicles used in the development site must be regularly washed (on a non-permeable surface or off-site) to avoid the dispersal of seeds on any alien or invasive species into the freshwater ecosystems		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Should erosion be noted at the base of the hardstands that may potentially impact on a freshwater ecosystem, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation		
	▪ The surface infrastructure areas must be inspected to ensure that no concentrated runoff from these areas form erosion gullies leading to erosion and sedimentation of the receiving freshwater ecosystems. Should these impacts be noted, these gullies/preferential flow paths must be infilled with in situ material and appropriately stabilised and/or revegetated		
	▪ Monitoring for the establishment for alien and invasive vegetation species must be undertaken, specifically at the hardstands. Should alien and invasive plant species be identified, they must be removed and disposed of as per an alien and invasive species control plan and the area must be revegetated with suitable indigenous vegetation.		
	▪ Routine maintenance of the roads must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events		
	▪ Stormwater runoff from the road crossings must be monitored, to ensure it does not result in erosion of the freshwater ecosystems. Stormwater must be allowed to diffusely spread across the landscape, by ensuring adequate surface roughness in the freshwater feature (through vegetation and rocky areas)		
	▪ Maintenance vehicles must make use of dedicated access roads and no indiscriminate movement in the freshwater ecosystems may be permitted		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Concentrated runoff from the road crossings leading to erosion and subsequent sedimentation of the freshwater ecosystems (increase in the sediment load) and turbulent flows when surface water is present; Higher flood peaks into the freshwater ecosystems due to reduced surface roughness in the freshwater ecosystems	▪ No indiscriminate movement of maintenance equipment or vehicles through the freshwater ecosystems must be permitted during standard operational activities or maintenance activities. Use must be made of the existing road crossings only;	▪ Site Manager ▪ EO	▪ Operation
	▪ Unnecessary disturbances surrounding the perimeter of the surface infrastructure must be avoided		
	▪ Vehicles used in the development site must be regularly washed (on a non-permeable surface or off-site) to avoid the dispersal of seeds on any alien or invasive species into the freshwater ecosystems		
	▪ Ensure that routine inspections and monitoring of any instream infrastructure are undertaken to monitor any build-up of debris that will impact on structure integrity or lead to erosion and sedimentation. Furthermore, monitoring to determine the establishment of indigenous vegetation and the presence of any alien or invasive plant species;		
	▪ Hot spots for the accumulation of debris and excess sediment must be identified and when necessary, debris/excess sediment must be removed by hand to prevent future flooding and potential damage to infrastructure;		
	▪ Routine maintenance of the roads must be undertaken to ensure that no concentration of flow and subsequent erosion occurs due to the road crossings/instream infrastructure. Such maintenance activities must specifically be undertaken after high rainfall events		
	▪ Stormwater runoff from the road crossings must be monitored, to ensure it does not result in erosion of the freshwater ecosystems. Stormwater must be allowed to diffusely spread across the		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	landscape, by ensuring adequate surface roughness in the freshwater feature (through vegetation and rocky areas)		
	▪ During periodic maintenance activities of the roads, monitoring for erosion must be undertaken		
	▪ Should erosion be observed, caused by the road crossings/instream infrastructure, the area must be rehabilitated by infilling the erosion gully and revegetation thereof with suitable indigenous vegetation. Use can also be made of rocks collected from the surrounding area to infill any area prone to erosion (however, these must be sustainably sourced not taken from the surrounding freshwater ecosystems including rivers in the local area)		
	▪ No indiscriminate movement of construction equipment in the freshwater ecosystems may be permitted. Use must be made of the existing roads during the decommissioning phase		
Disturbance of soil and vegetation that established within the decommissioning area.	▪ No indiscriminate movement of construction equipment in the freshwater ecosystems may be permitted. Use must ▪ be made of the existing roads during the decommissioning phase	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	▪ If applicable, for infrastructure within the non-perennial drainage line that is to be decommissioned, all materials must be removed from the freshwater ecosystems and may be stored/ stockpiled temporarily outside of the delineated extent of the freshwater ecosystems and their associated 32m buffer, whereafter it must be removed from site and disposed of at a registered disposal facility		
	▪ High flood peaks from the decommissioning footprint areas can be mitigated by ensuring that no concentrated runoff from the surface infrastructure area and subsequent cleared area enters the freshwater ecosystems. The velocity of surface water flow from		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	these areas must be reduced by the strategic placement of silt traps of hay bales as a means to obstruct flow but still allow flow to percolate at a reduced velocity and encourages a diffuse flow pattern. In this regard it is recommended at an alien and invasive plant species management plan be implemented during the decommissioning phase to specifically prevent the spread of any such species into the sensitive ecological areas		
	▪ Areas where surface infrastructure have been decommissioned and removed must be suitably compacted/ripped and revegetated to ensure that no erosion occurs which may contribute to the sediment load of the freshwater ecosystems		
	▪ Should erosion gullies be noted, these areas must be rehabilitated by infilling them with suitable soil and ensuring the area is vegetated. The increased surface roughness will discourage concentrated flow paths to develop and ensure diffuse flow patterns		
	▪ Should road crossings be decommissioned, road footprint areas within a freshwater feature must be levelled to the same level and shape as that of the upstream and downstream reaches. This will ensure a continuous bed level and prevent any concentration of surface flow from occurring		
	▪ Channel banks associated with the freshwater ecosystems must be suitably rehabilitated (shaped end revegetated) to prevent any erosion from occurring		
	▪ Follow up revegetation must take place where initial revegetation is not successful		
	▪ Post-closure monitoring of the freshwater ecosystems (for a period of 3 years), with specific mention of the invasion of alien vegetation species) is recommended to be undertaken		

Table 7-11 – Terrestrial Biodiversity: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.10 TERRESTRIAL BIODIVERSITY			
Impact Management Outcome: ▪ To minimise impact to the vegetation community. ▪ To minimise impact to plant SCC.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
loss of vegetation/ habitat	▪ A walkthrough would be needed prior to construction to inform permit applications for protected plant species.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ If possible, proposed Project infrastructure footprints should be further repositioned to avoid areas designated CBA and ESA.		
	▪ All vegetation clearing for the Project should be restricted to the proposed Project footprints only, with no clearing permitted outside of these areas. The footprints to be cleared of vegetation should be clearly demarcated prior to construction to prevent unnecessary clearing outside of these areas.		
	▪ As far as possible other proposed permanent Project infrastructure (e.g., O&M Office and Batching Plant) should be located in areas of modified habitat (i.e., Cultivated Fields, Old Lands).		
	▪ All temporary construction footprints, (e.g., construction camps, laydown areas), should only be located in areas of modified habitat;		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions.		
	▪ All vehicles are to remain on demarcated roads and no driving through the veld should be allowed.		
	▪ No collection of 'fuelwood' should be allowed on site.		
	▪ The ECO is to provide supervision on vegetation clearing activities and other activities which may cause damage to the environment, especially when construction commences and most vegetation clearing is taking place.		
	▪ River/stream crossings should be placed in areas without extensive wetlands and preferably in areas where the risk of disruption and erosion is low. River/stream crossings should be specifically designed not to impede or disrupt the direction and flow of the water. Specific guidelines of the aquatic specialist should be followed.		
	▪ No plants may be translocated or otherwise uprooted or disturbed without express permission from the ECO. Permits are required for the destruction or removal of provincially specially protected or protected species.		
	▪ A walkthrough would be needed prior to construction to inform permit applications for protected plant species.	▪ Site Manager ▪ Contractor	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Potential loss of threatened SCC, protected & endemic plant species	▪ Placement of infrastructure should be done in such a way as to minimise the impact on SCC or protected species.	▪ ESCO / ECO ▪ EO	
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to make them aware of the importance of SCC and protected species.		
	▪ Permits must be obtained for removal of protected species prior to construction, should avoidance not be possible.		
Loss of faunal habitat	▪ Vegetation clearance should be confined to the smallest possible footprint of the development and unnecessary clearance should be avoided.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns.		
	▪ A speed limit (of e.g., 40 km/h or appropriate limit) should be set on all roads and strictly adhered to.		
	▪ Development should avoid drainage lines and rocky outcrops. The outcrops may be favoured habitat for reptiles and other species since they offer protection from predators.		
	▪ Proper waste management procedures should be in place to avoid waste lying around and to remove all waste material from the sites.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Observe buffer zones along drainage lines.		
Direct faunal mortalities due to construction and increased traffic	▪ Construction crew, in particular the drivers, should undergo environmental training to increase their awareness of environmental concerns in order to reduce the number of road kills. The crew should also be made aware of not harming or collecting species such as snakes, tortoises and owls which are often persecuted.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Proper waste management procedures should be in place to avoid litter, food or other foreign material from lying around and all waste material should be removed from the site.		
	▪ Speed limits (e.g., 40 km/h or appropriate limit) should be set on all roads on site.		
	▪ Personnel should not be allowed to roam into the veld.		
	▪ Ensure that cabling and electrical infrastructure at the site are buried sufficiently deeply to avoid being excavated by fauna and that where such infrastructure emerges above-ground that it is sufficiently protected from gnawing animals.		
	▪ Any dangerous fauna (e.g., snakes, scorpions) that are encountered during construction should not be handled or molested by construction staff and the ECO or other suitably qualified persons should be contacted to remove the animals to safety.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have an escape ramp to allow any fauna that fall in to escape. ▪ Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in Mpumalanga. ▪ Access to the site should be strictly regulated to reduce the opportunities for poaching.		
Increased dust deposition	▪ Excessive dust must be reduced by spraying water onto the soil.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation ▪ Decommissioning
Increased human activity, noise and light levels	▪ The SANS standards should be adhered to in terms of noise levels. ▪ No major construction should be done at night. ▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Impacts of roads	▪ Wherever possible, existing roads/tracks should be used. ▪ The construction of a road should be done in the most environmentally sensitive manner possible.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ A suitably qualified person should plan, design and supervise the proper construction of roads to minimize the impact on the environment.		
	▪ Roads should be provided with run-off structures to reduce the risk of erosion.		
	▪ Proper road maintenance procedures should be in place.		
	▪ A long-term commitment to the maintenance of the road should be accepted. Roads can easily become ruts and erosion gullies if not properly planned and maintained.		
	▪ Driving in wet clayey soils after rain also result in deep tracks that damage the road surface and lead to other users bypassing such areas, thereby forming new tracks alongside the original ones.		
	▪ River/stream crossings should not be placed in areas with extensive wetlands and preferably in areas where the risk of disruption and erosion is low. All river/stream crossings should be inspected by the aquatic specialist during final design of the layout to ensure that optimal and acceptable locations have been chosen for river crossings.		
	▪ River/stream crossings should be specifically designed not to impede or disrupt the direction and flow of the water. Specific guidelines of the aquatic specialist should be followed.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Roads should not have steep curbs.		
	▪ Implement a monitoring program for the early detection of alien invasive plant species.		
	▪ A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts.		
	▪ Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel.		
	▪ No alien species should be used in rehabilitation or landscaping.		
	▪ Use only plants and seed collected on-site for revegetation.		
	▪ Material brought onto site e.g., building sand should be regularly checked for the germination of alien species.		
	▪ Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.		
Establishment of alien vegetation	▪ Implement a monitoring program (at least three-monthly intervals) for the early detection of alien invasive plant species. This programme should continue for at least 3 years post decommissioning	▪ Site Manager ▪ Contractor ▪ ESCO / ECO	▪ Construction ▪ Operation ▪ Decommissioning

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts.	▪ EO	
	▪ Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel.		
	▪ No alien species should be used in rehabilitation or landscaping. Grass species used during rehabilitation should be indigenous, locally-occurring perennial species.		
	▪ Use only plants and seed collected on-site for revegetation.		
	▪ Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife.		
	▪ Material brought onto site e.g., building sand should be regularly checked for the germination of alien species.		
	▪ No alien species should be used for landscaping, rehabilitation or any other purpose.		
	▪ Clearing of alien species should be done on a regular basis.		
Changes in animal behaviour	▪ Construction crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Development should avoid rocky outcrops and wetlands.		
	▪ Soil compaction should be kept to a minimum by restricting driving to designated roads.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.		
	▪ The mitigation measures as indicated by the noise specialist must be adhered to.		
Direct faunal mortalities	▪ Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
	▪ Access to the site should be strictly controlled.		
	▪ All excess wires, cables and waste material should be removed from the site.		
	▪ All vehicles at the site should adhere to a low speed limit (of e.g. 40 km/h (or whatever is appropriate) and slow-moving fauna such as tortoises on roads should be moved off the road.		
	▪ Electrical fences should be erected according to the norms and standards of the Nature Conservation Authorities in Mpumalanga.		
Increased light and noise levels and changes in animal behaviour	▪ The mitigation measures as indicated by the noise specialist must be adhered to.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
	▪ Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Soil compaction should be kept to a minimum by restricting driving to designated roads.		
	▪ If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. Motion-detecting lights should also be considered.		
Faunal mortalities	▪ Decommissioning crew should undergo environmental training to increase their awareness of environmental concerns. ▪ Speed limits (of e.g., 40 km/h) should be adhered to.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	▪ Proper waste management procedures should be in place and no material should be left on site in order to prevent instances of ensnarement or ingestion of foreign material. Electrical fences should be erected according to the norms and standards of the Nature Conservation Authorities in Mpumalanga.		

Table 7-12 – Plant Species: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.11 PLANT SPECIES			
Impact Management Outcome: ▪ To minimise impact to the vegetation community ▪ To minimise impact to plant SCC			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
Loss of vegetation/habitat	▪ Avoidance: • Areas of undisturbed natural habitat should be avoided as far as practically possible: • A walkthrough would be needed prior to construction to ensure that sensitive species and/or habitats are avoided and to inform permitting. Should the results of the walkthrough indicate that sensitive species and/or habitats are not fully avoided, further micrositing of the infrastructure should be undertaken through an amendment process post-authorisation. • Where possible, ESAs that are located in the Vulnerable Eastern Highveld Grassland should be avoided. • Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Pre-Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	• Ensure that all temporary use areas e.g., laydown areas and construction camp, are located in areas of low sensitivity. • Permits must be obtained for the destruction or removal of provincially specially protected or protected species.		
Loss of threatened, SCC, protected & endemic plant species	▪ Minimisation: • Footprints of the turbines, crane pads, roads, construction and substation locations should be clearly demarcated. • Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided. • All vehicles are to remain on demarcated roads and no driving through the veld should be allowed. • No collection of 'fuelwood' should be allowed on site.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Operation
Establishment of alien vegetation	▪ Minimisation and Avoidance: • Implement a monitoring program for the early detection of alien invasive plant species. • A control program should be employed to combat declared alien invasive plant species in the most environmentally friendly manner that does not result in undesirable secondary impacts. • Herbicides for the control of alien species should be applied according to the relevant instructions and by appropriately trained personnel. • Material brought onto site e.g., building sand should be regularly checked for the germination of alien species. • Active alien invasive species control should continue throughout the operational phase, as per the approved invasive species control and eradication programme.		▪ Construction ▪ Operation ▪ Decommissioning
	▪ Rehabilitation: • No alien species should be used in rehabilitation or landscaping.		▪ Construction ▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	• Use only plants and seed collected on-site for revegetation. • Cleared areas may need to be fenced-off during rehabilitation to exclude livestock and wildlife. • All project footprints and sites that were disturbed during decommissioning, should be actively rehabilitated using local-occurring perennial indigenous flora species.		
Increased water run-off and erosion	▪ Avoidance and Minimisation: • Clearing of vegetation, compaction and levelling should be restricted to the footprint of the proposed development. • All roads should have water diversion structures with energy dissipation features to slow and disperse the water into the receiving area. • Regular monitoring of the site during construction must be undertaken to identify and address erosion problems. • Silt traps should be used where there is a danger of topsoil eroding and entering streams and other sensitive areas. • Where applicable, construct stabilisation structures must be installed on slopes to prevent erosion. • Reduce activity on site after large rainfall events when the soils are wet. No driving off hardened roads until soils have dried out and the risk of bogging down has decreased. • A suitably qualified person should plan, design and supervise the proper construction of roads to minimise the impact on the environment.		▪ Construction ▪ Operation ▪ Decommissioning
	▪ Rehabilitation: • A rehabilitation and revegetation plan should be developed as part of the EMP.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	• If applicable, topsoil should be removed and stockpiled, then reapplied as soon as possible in order to facilitate regeneration of the natural vegetation on cleared areas.		
Impacts of roads	▪ Avoidance and Minimisation: • Wherever possible, existing roads/tracks should be used. • Roads should not have steep curbs. • The construction of a road should be done in the most environmentally sensitive manner possible. • Roads should be provided with run-off structures to reduce the risk of erosion.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Direct loss and disturbance of natural habitat	▪ As far as possible other proposed permanent Project infrastructure (e.g., O&M Office and Batching Plant) should be located in areas of modified habitat (i.e., Cultivated Fields, Old Lands); ▪ All temporary construction footprints, (e.g., construction camps, laydown areas), should only be located in areas of modified habitat. ▪ A pre-construction walkdown of the approved development footprints should be conducted during the wet/growing season to identify sensitive biodiversity and inform the micro-siting of Project infrastructure to already disturbed footprints and other relevant management measures. ▪ All vegetation clearing for the Project should be restricted to the proposed Project footprints only, with no clearing permitted outside of these areas; ▪ The footprints to be cleared of vegetation should be clearly demarcated prior to construction to prevent unnecessary clearing outside of these areas; ▪ No heavy vehicles should travel beyond the marked works zone; ▪ Removed topsoil should be stockpiled and used to rehabilitate all disturbed areas.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ A rehabilitation/ landscaping protocol should be developed and implemented to stabilise and revegetate all non-operational sites that have been disturbed by construction. The protocol should include: ▪ Stockpiling of topsoil that was cleared from development footprints during site preparation; ▪ Post-construction, the land form should be correctly contoured to limit potential erosion and compacted soils should be ripped and loosened to facilitate vegetation establishment; ▪ Topsoil removed during construction should be applied to all non-operational sites that were disturbed during construction and require revegetation; and ▪ Grass species used during rehabilitation should be indigenous, locally-occurring perennial species.		

Table 7-13 – Animal Species: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.12 ANIMAL SPECIES			
Impact Management Outcome: ▪ Prevent the loss of the faunal community			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Environmental awareness programme/toolbox talks. ▪ Adhere to sensitivity map criteria ▪ Monitoring and audit reports.			
Loss of fauna habitat	▪ Avoidance: Areas of undisturbed natural habitat should be avoided as far as practically possible: • A walkthrough would be needed prior to construction to ensure that sensitive species and/or habitats are avoided and to inform permitting. Should the results of the walkthrough indicate that sensitive species and/or habitats are not fully avoided, further micrositing of the infrastructure should be undertaken through an amendment process post-authorisation. • Construction crew, in particular the drivers, should undergo environmental training (induction) to increase their awareness of environmental concerns. This includes awareness as to remaining within demarcated construction areas, no littering, handling of pollution and chemical spills, avoiding fire hazards and minimising wildlife interactions. • Ensure that all temporary use areas e.g. laydown areas and construction camp, are located in areas of low sensitivity. • Permits should be obtained for the destruction or removal of provincially specially protected or protected species.	▪ Developer	▪ Pre-Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Loss of fauna habitat	▪ Minimisation: • Footprints of the turbines, crane pads, roads, construction and substation locations should be clearly demarcated. • Vegetation clearance should be confined to the footprint of the development and unnecessary clearance should be avoided; and • All vehicles are to remain on demarcated roads and no driving through the veld should be allowed.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction ▪ Rehabilitation
Direct faunal mortalities due to construction and increased traffic	▪ Minimisation and Avoidance: • Any fauna species trapped in construction areas, should be safely and correctly relocated to an adjacent area of natural habitat • Speed limits (e.g., 40 km/h or appropriate limit) should be set on all roads on site. • Holes and trenches should not be left open for extended periods of time and should only be dug when needed for immediate construction. Trenches that may stand open for some days, should have an escape ramp to allow any fauna that fall in to escape. • Should electrical fences be erected it must be done according to the norms and standards of the Nature Conservation Authorities in Mpumalanga. • Access to the site should be strictly regulated to reduce the opportunities for collusions.		▪ Construction
Increased human activity, noise and light levels.	▪ Avoidance and Minimisation: • The SANS standards should be adhered to in terms of noise levels. • No major construction should be done at night. • If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals.		▪ Construction ▪ Operation
Impacts of roads	▪ Avoidance and Minimisation: • Wherever possible, existing roads/tracks should be used.	▪ Developer	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Roads should not have steep curbs.		
Changes in animal behaviour	▪ Avoidance and Minimisation: • Development should avoid rocky outcrops and wetlands. • If there is any part of the site that needs to be lit at night for security reasons, then appropriate lighting should be installed to minimise negative effects on nocturnal animals. • Soil compaction should be kept to a minimum by restricting driving to designated roads. • The mitigation measures as indicated by the noise specialist must be adhered to.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Direct faunal mortalities	▪ Avoidance and Minimisation: • An Environmental Control Officer (ECO) should be on-site during vegetation clearing to monitor and manage any wildlife-human interactions; • Access to the site should be strictly controlled. • Maintenance crew should undergo environmental training, by way of an induction course, to increase their awareness of environmental concerns. • All vehicles at the site should adhere to a low speed limit (of e.g. 40 km/h (or whatever is appropriate) and slow-moving fauna on roads should be moved off the road. • The rules and regulations concerning fauna should be communicated to contractors through on-site signage and awareness training • An incidence register should be maintained throughout all phases of the Project detailing any fauna mortalities/injuries caused by on-site activities. The register should be used to identify additional biodiversity management requirements. • No off-road driving is permitted for vehicles and mobile machinery used during decommissioning phases activities;	▪ Developer	▪ Operation ▪ Decommissioning

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Vibrations from operating wind turbines disturbing fauna	▪ The Project proponent must keep actively informed about new research in the field of vibration impacts on fauna and potential mitigation options; ▪ Based on the findings of new research, the biodiversity management plan for the proposed Project should be updated to include additional mitigation measures and these should be implemented on-site.	▪ Developer	▪ Construction ▪ Operation ▪ Decommissioning

Table 7-14 – Avifauna: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.13 AVIFAUNA			
Impact Management Outcome: ▪ To minimise impacts to avifauna and their habitat.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Incident classification and reporting management procedure (to be developed). ▪ Avifauna Management Plan (to be developed) ▪ Environmental awareness programme/toolbox talks. ▪ Monitoring and audit reports.			
A standalone Avifauna Management Plan outlining specific, time-bound, and measurable impact management outcomes, clearly defined triggers for additional action (i.e. adaptive management), and clearly defined response timeframes is included in **Appendix I.**			
▪ Displacement of priority species ▪ Habitat transformation resulting from the wind turbines and associated infrastructure	▪ The All-Infrastructure Exclusion Zones should be implemented and maintained. No turbines should be constructed in the avifaunal turbine exclusion buffer zones as indicated in the sensitivity map.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Restrict construction to the immediate infrastructural footprint. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map.		
	▪ 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.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ All-Infrastructure Exclusion Zones should be implemented and maintained. No turbines should be constructed in the turbine exclusion buffer zones as indicated in the sensitivity.		
	▪ Restrict construction to the immediate infrastructural footprint. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map		
	▪ Prioritise upgrading existing roads (where the requisite roads authority permission has been issued) over constructing new roads.		
	▪ 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.	▪ Site Manager ▪ EO	▪ Operation
	▪ Formal live-bird monitoring and carcass searches must be implemented at the start of the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates. The exact time when operational monitoring must commence, will depend on the construction schedule, and it must commence when the first turbines start operating. Avifaunal monitoring must take place annually for the operational lifespan of the WEF.		
	▪ A biodiversity management plan for the site must be developed prior to commercial operation, potential biological removal (PBR) values for all priority species on-site will be determined. The calculation of PBR values will consider population sizes of the species and thus determine annual fatality thresholds for the site. If fatality numbers exceed these annual thresholds, additional mitigation measures must be implemented as part of the adaptive management strategy. The choice of additional mitigation measures will be dependent on the measures in place at the time and could involve the		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	implementation of additional SDoD measures or selective curtailment of specific turbines during high-risk periods		
	▪ All wind turbines must have one blade patterned according to a South African Civil Aviation Authority (SACAA) approved pattern to reduce the risk of raptor collisions. Refer to Appendix I for details.		
	▪ It is recommended that all wind turbines (WTGs) be subjected to either Observer-led Shutdown on Demand (OSDoD), Auto SDoD (ASDoD) or similar technology during daylight hours and radar flight detection technology for flocks of target species at night.		
	▪ A Radar-based Shutdown on Demand (SDoD) system (or similar suitable alternative), operated by trained personnel is recommended for use to identify flocks of priority bird species at the site. Turbines that could pose a risk to these flocks will be shut down to reduce the likelihood of collisions. This type of system will also detect nocturnal movements of species such as flamingos, which often fly in flocks, and trigger turbine shutdowns when such movements are observed at night. The system's ability to differentiate specific species based on their unique size and flight characteristics, such as potentially Secretarybirds and Blue Cranes, will be used to initiate appropriate turbine shutdowns.		
	▪ Given the lack of Secretarybird nest site fidelity, and in order to manage the risk of known shifts in nest sites across breading seasons, we recommend a proactive adaptive risk management plan that is underpinned by routine and systematic nest surveys in medium risk areas identified through habitat and flight risk modelling for this species. The proposed approach includes hierarchal tiers of risk management.		
	▪ Prior to the Operational Phase of the WEF all tree structures across the Project Site will be mapped by generating a canopy height model and applying a tree structure criteria-based model	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	(Appendix K, Tier 0, action 1). Secretarybird management zones across the WEF site will be delineated (tier 0 action 2) using the mapped tree structures, known nests sites and flight risk modelled outputs. During the operational phase of the WEF monthly orthophoto assessments will be conducted to monitor the prioritized management zones to identify active nest and roost structures (Appendix K, tier 1). If active nests/roosts are identified it is recommended that SDoD and/or automated curtailment or a similar technology will be implemented. Refer to Appendix K for further details.		
Displacement of priority species from breeding/feeding/roosting areas	▪ The All-Infrastructure Exclusion Zones should be implemented and maintained No turbines should be constructed in the avifaunal turbine exclusion buffer zones as indicated in the sensitivity map. ▪ Restrict construction to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map. ▪ 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. ▪ Formal live-bird monitoring and carcass searches should be implemented at the start of the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins et al. 2015) to assess collision rates. They exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. Avifaunal monitoring should take place annually for the operational lifespan of the WEF.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
	▪ No turbines should be constructed in the avifaunal turbine exclusion buffer zones as indicated in the sensitivity map.	▪ Site Manager ▪ Contractor	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Bird mortality and injury resulting from collisions with the wind turbines	▪ Restrict construction to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map. ▪ 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. ▪ All water reservoirs and ensure that no water sources are located within the rotor-swept areas or near above-ground electrical infrastructure ▪ All wind turbines must have one blade painted according to a South African Civil Aviation Authority (SACAA) approved pattern to reduce the risk of raptor collisions. While blade painting as a mitigation strategy is still in its experimental phase in South Africa, international research shows that it has a promising potential to reduce raptor mortality. Research conducted in Norway, as explained in Simmons et al. 2021 (Appendix I), supports this finding. ▪ Vulpro must be immediately notified if any vulture is negatively impacted by collision ▪ Formal live-bird monitoring should commence following initial turbine operation, as per the Best Practice Guidelines, to determine the extent to which priority species displacement has occurred. Avifaunal monitoring should take place annually for the operational lifespan of the WEF.	▪ ESCO / ECO ▪ EO	
Electrocution of priority species on the on-site sub-stations and internal 33kV network.	▪ Use underground cabling as much as is practically possible. ▪ All above-ground internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the applicable Eskom standard, which must be visible at night. ▪ Where the use of overhead lines is unavoidable, raptor-friendly pole design should be used, with appropriate mitigation measures for	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	complicated pole structures (e.g., insulation of live components to prevent electrocutions on terminal structures and pole transformer), as recommended by the Avifaunal Specialist. ▪ Vulpro must be immediately notified if any vulture is negatively impacted by electrocution ▪ Apply insulation reactively in the substation if significant electrocutions of SCC are recorded.		
Collisions of priority species with the internal 33kV network	▪ Use underground cabling as much as is practically possible. ▪ All above-ground internal medium voltage lines must be marked with Eskom approved Bird Flight Diverters according to the applicable Eskom standard.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
Noise pollution and environmental disruption during the decommissioning phase	▪ Restrict dismantling to the immediate infrastructural footprint where possible. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity map. ▪ 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.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning

Table 7-15 – Archaeological and Cultural Heritage: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.14 ARCHAEOLOGICAL AND CULTURAL HERITAGE			
Impact Management Outcome: ▪ To ensure that sites/artefacts of heritage value are identified and protected.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Monitoring and audit reports.			
Archaeological resources	▪ Implement a 30 m buffer between the archaeological sites and the proposed infrastructure (it is recognised that a 30 m buffer may be impossible to the south of Site 05 due to the farm boundary but the buffer in this area should be as large as is technically feasible) ▪ Report any chance finds made during development.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Loss of heritage resources	▪ Monitoring of the Project area by the ECO during pre-construction and construction phases for chance finds, if chance finds are encountered to implement the Chance Find Procedure for the project. ▪ Development activities must be confined to the approved development footprint only. The ruins and semi-circular stone enclosures should preferably be added to development plans and avoided with a 30m buffer zone. If the site cannot be avoided, it must be mapped and recorded prior to the application of a destruction permit.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
Damage to or destruction of graves	▪ Implement a minimum 30 m no-go buffer around the graveyard at Site PF007, PF008, PF009 and fence the portion of the graveyard falling within the project site with a farm-style fence with pedestrian gate. An	▪ Site Manager ▪ Contractor ▪ ESCO / ECO	▪ Construction ▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	access protocol should be compiled for Next of Kin (NoK) who might want to visit the site as well as a grave management plan to ensure the site is protected. If the burial sites cannot be avoided, the graves can be relocated with the necessary approvals.	▪ EO	
	▪ A Grave Management Plan should be compiled for the burial sites present within the Project area.		
	▪ The decommissioning phase should be kept as short as possible.		

Table 7-16 – Traffic: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.15 TRAFFIC			
Impact Management Outcome: ▪ To ensure that the traffic impacts of the project are mitigated and managed.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed). ▪ Traffic and transportation management plan			
Increase in Development Trips	▪ Reduce the construction period, where possible.	▪ Site Manager ▪ Contractor	▪ Construction ▪ Decommissioning
	▪ Stagger the construction phase.		
	▪ Design and maintenance of internal roads.		
	▪ Provide several access points to the site to split construction vehicle trips and reduce the risk of congestion at a single access		
	▪ Maintenance and repairs of road sections of the N11 and, respectively, D383, D1102 and D1217 that have been damaged by construction vehicles. Any damage needs to be closely monitored to decide on the responsible party to repair		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Staff and general trips should occur outside of peak traffic periods as much as possible.		
	▪ Stagger components delivery to site.		
	▪ Use of mobile batch plants and quarries in close proximity to the site to decrease the impact on the surrounding road network.		
	▪ Reduce the decommissioning period where possible.		
	▪ Stagger the decommissioning phase.		
	▪ Source on-site water if possible.		
Noise and dust pollution	▪ Source on-site water if possible.	▪ Site Manager ▪ Contractor	▪ Operation

Table 7-17 – Visual: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.16 VISUAL			
Impact Management Outcome: ▪ To ensure that the changes to the landscape character of the area are mitigated to minimise the negative impact.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Incident classification and reporting management procedure (to be developed). ▪ Monitoring and audit reports.			
Visual Impacts	▪ Carefully plan to minimise the construction period and avoid construction delays.	▪ Developer ▪ Site Manager	▪ Construction
	▪ Where possible, restrict construction activities to daylight hours in order to negate or reduce the visual impacts associated with lighting.		
	▪ Inform receptors within 1km of the WEF development area of the construction programme and schedules.		
	▪ Maintain a neat construction site by removing rubble, litter and waste materials regularly.		
	▪ Minimise vegetation clearing and rehabilitate cleared areas as soon as possible.		
	▪ Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.		
	▪ Make use of existing gravel access roads where possible.		
	▪ Limit the number of vehicles and trucks travelling to and from the construction site, where possible.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Ensure that dust suppression techniques are implemented: • on all access roads; • in all areas where vegetation clearing has taken place; and • on all soil stockpiles.		
	▪ Turbine colours should adhere to CAA requirements. Logos on the turbines should be kept to a minimum and turbine towers should be painted in neutral colours such as white or grey.	▪ Developer ▪ Site Manager	▪ Operation
	▪ Inoperative turbines should be repaired promptly, as they are considered more visually appealing when the blades are rotating (or at work) (Vissering, 2011).		
	▪ If turbines need to be replaced for any reason, they should be replaced with turbines of similar height and scale to lessen the visual impact.		
	▪ As far as possible, limit the number of maintenance vehicles which are allowed to access the site.		
	▪ Non-reflective surfaces should be used where possible.		
	▪ Ensure that dust suppression techniques are implemented on all gravel access roads.		
	▪ As far as possible, limit the amount of security and operational lighting present on site (whilst adhering to relevant safety standards).		
	▪ Light fittings for security at night should reflect the light toward the ground and prevent light spill.		
	▪ Lighting fixtures should make use of minimum lumen or wattage whilst adhering to relevant safety standards.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Mounting heights of lighting fixtures should be limited, or alternatively foot-light or bollard level lights should be used.		
	▪ If possible, make use of motion detectors on security lighting.		
	▪ Where possible, the operation and maintenance buildings should be consolidated to reduce visual clutter.		
	▪ All infrastructure that is not required for post-decommissioning use should be removed.	▪ Developer ▪ Site Manager	▪ Operation
	▪ Carefully plan to minimize the decommissioning period and avoid delays.		
	▪ Maintain a neat decommissioning site by removing rubble and waste materials regularly.		
	▪ Position storage / stockpile areas in unobtrusive positions in the landscape, where possible.		
	▪ Ensure that dust suppression procedures are maintained on all gravel access roads throughout the decommissioning phase.		
	▪ Employ micro-siting and orientation of turbines and other infrastructure to group with existing infrastructure and already disturbed areas		
	▪ All cleared areas should be rehabilitated as soon as possible.		
Airborne dust	▪ Water down construction roads and large bare areas as frequently as is required to minimise airborne dust.	▪ Developer ▪ Site Manager ▪ ECO	▪ Construction ▪ Operation ▪ Decommissioning
	▪ Enforce a 40 km/h speed limit on site for all vehicles		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Monitor dust fallout if any complaints are received, using appropriate dust monitoring programme		

Table 7-18 – Socio-Economic: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.17 SOCIO-ECONOMIC			
Impact Management Outcome: ▪ To ensure that the negative socio-economic impacts are mitigated and managed. ▪ To ensure that the positive socio-economic impacts are enhanced.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Occupational health and safety plan (to be developed). ▪ Health and safety protocol (to be developed). ▪ Employment records and community engagement local enterprise development records.			
Creation of local employment, training, and business opportunities	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories. However, due to the low skills levels in the area, the majority of skilled posts are likely to be filled by people from outside the area.		
	▪ Where feasible, efforts should be made to employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Before the construction phase commences the proponent should meet with representatives from the Msukaligwa Local Municipality (MLM) to establish the existence of a skills database for the area. If such a database exists, it should be made available to the contractors appointed for the construction phase		
	▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of the final decision regarding the project and the potential job opportunities for locals and the employment procedures that the proponent intends following for the construction phase of the project.		
	▪ Where feasible, training and skills development programmes for locals should be initiated prior to the initiation of the construction phase.		
Construction workers on local communities	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		
	▪ The SEP and CHSSP should include a Grievance Mechanism that enables stakeholders to report resolve incidents		
	▪ Where possible, the proponent should make it a requirement for contractors to implement a 'locals first' policy for construction jobs, specifically for semi and low-skilled job categories.		
	▪ The proponent should consider the option of establishing a Monitoring Committee (MC) for the construction phase that representatives from local landowners, farming associations, and the		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	local municipality. This MC should be established prior to commencement of the construction phase and form part of the SEP.		
	▪ The proponent and contractor should develop a Code of Conduct (CoC) for construction workers. The code should identify which types of behaviour and activities are not acceptable. Construction workers in breach of the code should be subject to appropriate disciplinary action and/or dismissed. All dismissals must comply with the South African labour legislation. The CoC should be signed by the proponent and the contractors before the contractors move onto site. The CoC should form part of the CHSSP.		
	▪ The proponent and the contractor should implement an HIV/AIDS, COVID-19 and Tuberculosis (TB) awareness programme for all construction workers at the outset of the construction phase. The programmes should form part of the CHSSP.		
	▪ The contractor should provide transport for workers to and from the site on a daily basis. This will enable the contactor to effectively manage and monitor the movement of construction workers on and off the site.		
	▪ The contractor must ensure that all construction workers from outside the area are transported back to their place of residence within 2 days for their contract coming to an end.		
	▪ No construction workers, with the exception of security personnel, should be permitted to stay over-night on the site.		
Job seekers on local communities	▪ Preparation and implementation of a Stakeholder Engagement Plan (SEP) prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ Developer ▪ Site Manager	▪ Construction
	▪ Preparation and implementation of a Community Health, Safety and Security Plan (CHSSP) prior to and during the construction phase.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The proponent, in consultation with the MLM, should investigate the option of establishing a MC to monitor and identify potential problems that may arise due to the influx of job seekers to the area. The MC should also include the other proponents of solar energy projects in the area.		
	▪ The proponent should implement a "locals first" policy, specifically with regard to unskilled and low skilled opportunities.		
	▪ The proponent should implement a policy that no employment will be available at the gate.		
Increased risk of grass fires	▪ Preparation and implementation of a SEP prior to and during the construction phase.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Construction
	▪ Preparation and implementation of a CHSSP prior to and during the construction phase.		
	▪ The proponent should enter into an agreement with the directly affected farmers whereby damages to farm property etc., during the construction phase will be compensated for. The agreement should be signed before the construction phase commences.		
	▪ Contractor should ensure that open fires on the site for cooking or heating are not allowed except in designated areas.		
	▪ Smoking on site should be confined to designated areas.		
	▪ Contractor should ensure that construction related activities that pose a potential fire risk, such as welding, are properly managed and are confined to areas where the risk of fires has been reduced. Measures		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	to reduce the risk of fires include avoiding working in high wind conditions when the risk of fires is greater. In this regard special care should be taken during the high-risk dry, windy winter months.		
	▪ Contractor should provide adequate fire-fighting equipment on-site, including a fire fighting vehicle.		
	▪ Contractor should provide fire-fighting training to selected construction staff. As per the conditions of the Code of Conduct, in the advent of a fire being caused by construction workers and or construction activities, the appointed contractors must compensate farmers for any damage caused to their farms. The contractor should also compensate the fire-fighting costs borne by farmers and local authorities.		
	▪ No construction staff, with the exception of security staff, to be accommodated on site overnight.		
Loss of farmland	▪ The developers should liaise with the owners of the property to identify suitable alternative locations for the construction camp clusters.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO ▪ Developer	▪ Construction
	▪ The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented.		
	▪ Affected landowners should be consulted about the timing of construction related activities in advance.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The footprint associated with the construction related activities (access roads, construction platforms, workshop etc.) should be minimised.		
	▪ An ECO should be appointed to monitor the establishment phase of the construction phase.		
	▪ All areas disturbed by construction related activities, such as access roads on the site, construction platforms, workshop area etc., should be rehabilitated at the end of the construction phase.		
	▪ The implementation of a rehabilitation programme should be included in the terms of reference for the contractor/s appointed. The specifications for the rehabilitation programme should be drawn up by the Environmental Consultants appointed to manage the EIA.		
	▪ The implementation of the Rehabilitation Programme should be monitored by the ECO		
Improve energy security and support renewable sector	▪ Maximise opportunities for local content and procurement.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
	▪ Maximise employment opportunities for local community members.		
	▪ Implement training and skills development programs for members from the local community.		
Creation of employment and business opportunities	▪ Where reasonable and practical, the proponent should appoint local contractors and implement a 'locals first' policy, especially for semi and low-skilled job categories.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Where feasible, efforts should be made to employ local service providers that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria.	▪ EO	
	▪ The local authorities, community representatives, and organisations on the interested and affected party database should be informed of potential job opportunities for locals and the employment procedures for operational phase. ▪ A training and skills development programmes for locals should be initiated as part of the operational phase.		
	▪ The recruitment selection process should seek to promote gender equality and the employment of women wherever possible.		
	▪ The proponent should liaise with the LM with regards the establishment of a database of local companies, specifically BBBEE companies, which qualify as potential service providers.		
Generate income for affected landowners	▪ Implement agreements with affected landowners.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
	▪ The loss of high-quality agricultural land should be avoided and or minimised. The recommendations of the agricultural / soil assessment should be implemented.		
Visual impact and impact on sense of place	▪ The recommendations contained in the VIA should be implemented.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Operation
Retrenchment including loss of jobs, and source of income	▪ The proponent should ensure that retrenchment packages are provided for all staff retrenched when the plant is decommissioned.	▪ Site Manager ▪ Contractor ▪ ESCO / ECO ▪ EO	▪ Decommissioning
	▪ All structures and infrastructure associated with the proposed facility should be dismantled and transported off-site on decommissioning.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Revenue generated from the sale of scrap metal during decommissioning should be allocated to funding closure and rehabilitation of disturbed areas.		

Table 7-19 – Bats: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.18 BATS			
Impact Management Outcome: ▪ To ensure that the negative socio-economic impacts are mitigated and managed. ▪ To ensure that the positive socio-economic impacts are enhanced.			
Indicator and Compliance Mechanism: ▪ Induction training and records. ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Monitoring and audit reports. ▪ Incident classification and reporting management procedure (to be developed). ▪ PPE Register. ▪ Bat Management Plan (to be developed). ▪ Health and safety protocol (to be developed). ▪ Employment records and community engagement local enterprise development records.			
Loss of foraging habitat by clearing of vegetation	▪ Adhere to the sensitivity map criteria (already implemented). Rehabilitate cleared vegetation where possible at areas such as laydown yards.	▪ Site Manager ▪ Contractor ▪ Developer ▪ ECO	▪ Construction
Roost destruction during earthworks	▪ Adhere to the sensitivity map criteria (already implemented).		
Mortalities (collision and/or barotrauma) during foraging (resident bats)	▪ Turbine layout adjustments to be completed through an amendment process post-EA to adhere to the sensitivity map (already implemented), and where needed, reducing blade movement at selected turbines during high-risk bat activity times/weather conditions. Acoustic deterrents are developed well enough to be trialled. The WEF should measure its bat mortality impact during operation and ensure that the WEF impact remain within sustainable levels.		▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Bat mortalities	▪ Reducing blade movement at selected turbines if a migration route is discovered. Acoustic deterrents are developed well enough to be trialled.		
	▪ Avoid High sensitive areas, including all bat significant features and the buffers around these. No turbine, including its full rotor swept area and a 2 m pressure buffer around this, should occur in High sensitive areas.i		
	▪ Avoid Medium-High sensitive areas where possible, in particular, the 2.5-5 km buffer around the PH4 monitoring location where very high levels of bat activity were recorded. Should turbines be proposed in Medium-High sensitive areas, IWS recommends that these are each fitted with a Wildlife Acoustics SMART bat detectors, curtailment can then be limited to specific turbines and periods where and when elevated bat activity is recorded.		
	▪ A Bat Management Plan must be developed prior to commissioning. This plan must facilitate the adaptive mitigation and management and bat mortalities on site.		
	▪ Monitor bat fatalities as soon as the first turbine is operational – as per the latest SABAA guideline for this (Aronson et al. 2020 or later) and the latest (2023 or later) IFC Good Practice Handbook on post-construction bird and bat fatality monitoring for onshore WEFs in emerging market countries. At the very least, bat fatality monitoring should be conducted during the WEF's first two years of operation, and then every fifth year thereafter. The monitoring and data analysis are to be conducted to a high standard so that there is confidence in the estimated numbers of actual bat fatalities.		
	▪ Conduct passive monitoring of live bat activity as soon as the first turbine is operational, and whenever bat fatality monitoring is performed during the WEF's operation. The operational passive monitoring should represent a repeat of the pre-construction passive		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	monitoring, so far as this is possible. This will allow for comparison of operational bat activity levels with pre-construction bat activity levels and operational bat fatalities, and it will help to assess the efficacy of any implemented bat fatality mitigation measures.		
	▪ Mitigate bat fatalities adaptively by consulting the latest SABAA guideline for this (Aronson et al. 2018 or later), and the best available relevant scientific information. Taxon-specific differences should be taken into consideration if/when fatality mitigation measures are implemented. The calculation of bat fatality thresholds (as described by MacEwan et al. 2018) is dependent, inter alia, on the final (constructed) layout of turbines. Adequate financial provision should be made to permit effective monitoring, management, and mitigation of bat fatalities throughout the life of the WEF.		
	▪ Forward all (live and fatality) bat monitoring data to the database recommended by the South African Bat Assessment Association (SABAA) to expand the scientific knowledge base for more informed decision making and mitigation.		
Increased bat mortalities due to light attraction and habitat creation	▪ Only use lights with low sensitivity motion sensors that switch off automatically when no persons are nearby, to prevent the creation of regular insect gathering pools. This will be at turbine bases (if applicable, and other infrastructure buildings). For buildings, avoid tin roofs and roof structures that offer entrance holes into the roof cavity. The stormwater management plan should prevent the creation of any artificial wetlands and open water sources within 300m of any turbine bases.		
Terrestrial habitat loss, and possible displacement of bats	▪ Minimise the length and breadth of proposed roads to thus minimise the loss and fragmentation of terrestrial (bat foraging) habitat.	▪ Site Manager ▪ Contractor ▪ Developer	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Minimise the degradation of terrestrial habitat by implementing and maintaining effective dust, stormwater, erosion, sediment, and invasive alien plant control measures.	▪ ECO	▪ Construction ▪ Operation
	▪ Minimise artificial lighting on site (excluding compulsory civil aviation lighting) – especially high-intensity, steady-burning, sodium vapour, quartz, halogen, and other bright lights at substations, offices, and turbines (to avoid disturbing roosts of certain sensitive bat species). All non-aviation lights should be hooded downward and directed to minimise horizontal and skyward illumination. Where possible, solar-powered motion-sensitive lights should be used.		
	▪ Rehabilitate disturbed terrestrial habitat by comprehensively and diligently implementing effective rehabilitation measures based on consultation with an appropriate vegetation specialist.		▪ Construction ▪ Operation ▪ Decommissioning

Table 7-20 – Geotechnical: EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.19 GEOTECHNICAL			
Impact Management Outcome: ▪ To implement measures to minimise impacts on the environment from the initiation of construction activities through planning, careful site access route selection and implementation of mitigation measures.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Inductions training and register. ▪ Environmental awareness programme/toolbox talks.			
Soil erosion:	▪ Rehabilitation of affected areas (such as revegetation). ▪ Construction of temporary berms and drainage channels to divert surface water. ▪ Minimize earthworks and fills. ▪ Where possible, use existing road network and access tracks. ▪ Ensure correct engineering design and construction of gravel roads and water crossings. ▪ Ensure adequate control of stormwater flow. ▪ Use temporary berms and drainage channels to divert surface water. ▪ Minimize earthworks and demolish footprints. ▪ Rehabilitate affected areas (such as revegetation).	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Construction ▪ Decommissioning

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Reinstate channelized drainage features.		
	▪ Strip, stockpile and re-spread topsoil.		
Contamination of ground and Surface water resources from heavy plant leading to quality deterioration of the water resources.	▪ Vehicle and construction machinery repairs to be undertaken in designated areas with proper soil protection.		
	▪ Frequent checks of vehicles and construction machinery for oil leaks.		
The displacement of natural earth material and overlying vegetation leading to erosion.	▪ Limit excavations to what is necessary.		
Damage of proposed development.	▪ Design all infrastructure according to SANS 10160-4 to ensure the proposed development meets the minimum requirements for infrastructure in a seismic zone.		
Slope instability around structures	▪ Avoid steep slope areas. ▪ Design cut scopes according to detailed geotechnical analysis.	▪ Contractor (Site Manager) ▪ ECO	▪ Construction
Soil Erosion	▪ Where possible, use existing road network and access tracks.	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Operation
	▪ Use of temporary berms and drainage channels to divert surface water.		
	▪ Minimize earthworks and demolish footprints.		
	▪ Rehabilitation of affected areas (such as revegetation).		
	▪ Reinstate channelized drainage features.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Strip, stockpile and re-spread topsoil.		
Oil Spillages/potential oil spillages due to clearance of structures	▪ Vehicle repairs to be undertaken in designated areas with proper soil protection. ▪ Frequent checks of vehicles and construction machinery for oil leaks.	▪ Project Manager ▪ EO ▪ Contractor (Site Manager)	▪ Operation ▪ Decommissioning

Table 7-21 - Risk Assessment EMPr Mitigation and Management Measures

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
7.20 RISK ASSESSMENT			
Impact Management Outcome: ▪ Identification of the likely hazards and hazardous events related to the operation of the installation.			
Indicator and Compliance Mechanism: ▪ Health, safety, environmental and community incident and complaints management system register. ▪ Close-out on incidents. ▪ Monitoring and audit reports. ▪ Inductions training and register. ▪ Environmental awareness programme/toolbox talks.			
Human health	▪ The construction phase should be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993 specifically the Construction Regulations.	▪ Project Manager ▪ EO ▪ Contractor (Site Manager) ▪ ECO	▪ Construction
	▪ SHEQ policy should be in place.		
	▪ A detailed construction Risk Assessment prior to work		
	▪ SHE procedure in place.		
	▪ Emergency response plan to be in place prior to beginning construction and to include aspects such as appointment of emergency controller, provision of first aid, first responder contact numbers		
Exposure to noise	▪ Health Risk Assessment to determine if equipment noise exceeds 85dB at workstation and 61dB at boundary of the site	▪ Project Manager ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
		▪ Contractor (Site Manager)	
	▪ Employees to be provided with hearing protection if working near equipment that exceeds the noise limits.	▪ ECO	▪
	▪ Ensure continuous noise does not exceed 85dB within the facilities or at any other location on site or 61 dB at the site boundary, e.g., emergency generator, air compressor etc.	▪ Developer ▪ EO	▪ Operation
	▪ Employees to be provided with hearing protection if working near equipment that exceeds the noise limits.		
Exposure to temperature extremes and/or humidity	▪ Construction site facilities to comply with Occupational ▪ Health and Safety Act 85 of 1993 specifically the thermal, humidity, lighting and ventilation requirements of the Environmental Regulations for Workplaces	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Adequate potable water for employees to be provided during all phases of the project. Bore hole, bowser and tank or small water treatment plant may be required to provide potable water for the BESS installation staff during all phases of the project		
	▪ Building and container facilities to comply with Occupational Health and Safety Act 85 of 1993 specifically the thermal, humidity, lighting and ventilation requirements of the Environmental Regulations for Workplaces.	▪ Developer ▪ EO	▪ Operation
	▪ Ensure containers are temperature controlled as required to remain within the optimal battery operating temperature range.		
	▪ Lighting to be provided inside any buildings, inside the containers, possibly linked to the door opening and outdoors where necessary		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Adequate potable water to be provided during all phases of the project		
	▪ Suitable lighting to be provided including emergency lighting for safe building exit in the event of power failure		
	▪ PPE for operations and maintenance staff to be suitable for the weather conditions.		
Exposure to psychological stress	▪ Adopt all mitigation measures as listed in the Social Impact Assessment study	▪ Project Manager ▪ EO ▪ Contractor	▪ Construction
	▪ Staff rotation to other activities within the site may be necessary	▪ EO ▪ Developer	▪ Operation
	▪ Performance monitoring of inspections / maintenance tasks in particular will be necessary. ▪		
	▪ Adopt all mitigation measures as listed in the Social Impact Assessment study.		
Exposure to ergonomic stress	▪ Training in lifting techniques to be conducted.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Ensure that despite the isolated location all the necessary equipment is available (and well maintained) during construction. Otherwise employees may revert to unsafe practices. Isolated location, maintenance of construction equipment to ensure safe operation is critical. Ensure this is in place prior to project beginning		
	▪ First aid provision on site		
	▪ If equipment is at height (see OHS Act General Safety Regulation 6), ensure suitable safe (electrically and physically) ladders / harnesses etc. are available	▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Working at height procedure to be in place.		
Exposure to fire radiation	▪ Fuels stored on site in dedicated, demarcated and bunded areas.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Suitable fire-fighting equipment on site near source of fuel, e.g., diesel tank, generators, mess, workshops etc.		
	▪ The company responsible for the facility at this stage is to have: • Emergency plan to be in place prior to commencement of construction. • Fuel spill containment procedures and equipment to be in place. • Hot-work permit and management system to be in place.		
	▪ Solid state battery design includes abuse tests such as drop test, impact, rapid discharge etc		
	▪ Propagation tests for systems, e.g., heat insulating materials between cells/modules.		
	▪ Factory acceptance test prior to prior to leaving manufacture. Batteries are usually stored at 50% charge to prolong life but may be shipped fully discharged. This level of detail should be understood so as to assess the risk during transport and storage		
	▪ The company responsible for the battery installation should ensure suitably competent transport companies are appointed. The company responsible for transportation should ensure: Compliance with National Road Traffic Act regulation 8 dangerous goods		
	▪ Port Authorities should be alerted to the overall project and the hazardous nature of the contents of battery containers being imported. Note. If, as per one of the typical suppliers (Tesla) indications, the containers are classified as IMDG Class 9 the containers will not receive		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	any special care in the ports and may be stored next to flammables. Port emergency response in particular need training on mitigating battery hazards.		
	▪ Prior to bringing any containers into the country, the company responsible for the battery installation (possibly via appointed contractors) should ensure that an emergency response plan is in place for the full route from the ship to the site. Drivers trained in the hazards of containerized batteries. • The Emergency plan must determine and address: • What gases would be released in a fire and are there inhalation hazards. • What initial fire extinguishing medium should be used. • Whether there are any secondary gases or residues from use of extinguishers. • If water is appropriate, determine if the system needs outside connections to sprinklers inside the container. • First responders need to know what media to use, especially if water totally unsuitable and if there are no connection points for water etc. • Must the container be left unopened or opened. • PPE to be specified including possible exposure to chemicals and fumes as well as radiate heat. • Containment of residues/water/damaged equipment. • Suitable safe making and disposal plan for after the event i.e. how do responders deal with partially charged damage units, contaminated surfaces (e.g., HF residues).		
	▪ Grass cutting and fire breaks around the BESS installations to prevent veld fires	▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ No combustible materials to be stored in or near the batteries or electrical infrastructure. Separation of site diesel tank, transformers from BESS and vice versa.		
	▪ Testing as part of commissioning of each unit and the overall system. Abuse tests conducted by supplier		
	▪ BMS should be checking individual cell voltage as well as stack, module, container, system voltages/current etc. BMS tripping the cell and possibly the stack/building unit or module/rack/container, if variations in voltage. Diagnostics easily accessible. Diagnostics able to distinguish cell from stack or cell from module faults. Protective systems are only as good as their reliability and functionality testing is important, e.g., testing that all battery trips actually work		
	▪ Fire resistant barrier between the batteries and the PCS side if in the same container, or separate containers		
	▪ Suitable ingress protection level provided for electrical equipment, e.g., IP55 - 66. If air cooling into container, suitable dust filters to be provided. Smoke detectors linked to BMS & alerts in control room		
	▪ Effects of battery aging to be considered. Solid state battery life starts to be impacted above 40˚C and significant impacts above 50˚C with thermal runaway starting at 65-70˚C. BMS trips system at 50˚C		
	▪ Temperature monitoring to be in place		
	▪ Regular infrared scanning. Data needs to be stored for trend analysis		
	▪ Data indicates an event frequency of 0.001 per installation and with 100 units this would mean an event once 10 years, i.e. a low probability event		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Prior to commencement of cold commissioning, emergency plan from transport and construction phase to be extended to operational phase and to include the hazards of the electrically live system		
	▪ Procedure to address solid state container must be in place		
	▪ A planned fire response to prevent escalation to an explosion or an environmental event must be in place ▪		
	▪ Suitable supply of fire extinguishing medium and cooling medium		
	▪ Consider fire water for cooling equipment adjacent to BESS units.		
	▪ Ensure procedures in place for clean up after event Lingering HF and other toxic residues in the soil and on adjacent structures.		
	▪ Smoke or gas detector systems that are not part of the original battery container package, need to be linked to the main control panel for the entire system so that issues can be detected and responded to rapidly.		
	▪ Modern lithium container design put the PCS in another part of the container with a fire rated wall separating it from the battery. Alternately the PCS is another container altogether.		
Exposure to explosion over pressures	▪ During transport this is only likely to happen due to possible inappropriate emergency response, e.g., opening containers when they may be the type that should be left to burn out. For simplicity one transport route would be preferable. The route needs to be assessed in terms of responding local services, rest places for drivers, refuelling if required, break down services available etc.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Once an import route has been chosen, e.g., Richards Bay or Durban and along N2/N3/N11 etc, then the appointed transport company should		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	ensure key emergency services on route could be given awareness training in battery fire/accident response. Emergency response planning and training referred to above may be important for key locations such as the mountain passes / tunnels.		
	▪ Electrical equipment will be specified to suit application.	▪ EO ▪ Developer	▪ Operation
	▪ Emergency response plan and employee training referred to above is to be in place		
	▪ Undertake a hazardous area classification of the inside of the container to confirm the rating of electrical equipment, due to possible leaks of electrolyte or generation of flammable gases under thermal runaway. Emergency response plan and employee training referred to above is critical		
	▪ Suitable training of selected emergency responders who may be called out to the facilities is critical		
Exposure to acute toxic chemical and biological agents	▪ All necessary good hygiene practices to be in place, e.g., provision of toilets, eating areas, infectious disease controls.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ Awareness training for persons on site, safety		
	▪ Induction to include animal hazards		
	▪ First aid and emergency response to consider the necessary anti-venom, anti-histamines, topical medicines etc		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Due to isolated locations some distance from town, the ability to treat with anti-venom and extreme allergic reactions on site is critical to mitigate the impacts		
	▪ Appointed transport company to ensure transport in accordance with Regulation 8 of the National Road Traffic Act 93 of 1996, Dangerous Goods.		
	▪ The applicant is not permitted to transport prescribed goods in manner not consistent with the prescriptions, e.g., consignor and consignee responsibilities and prescription found in SANS 10228/29 and international codes for battery transport etc		
	▪ Transport in sealed packages that are kept upright, protected from movement damage etc. Additionally transported material should be packaged to ensure no short-circuiting during transportation		
	▪ Transport to prevent excessive vibration considerations as battery internal may be damaged leading to thermal run-away during commissioning		
	▪ Pre-assembled containers will most likely be supplied. These will be fitted with the necessary protective measures by the supplier considering marine and road transport as well as lifting, setting down etc.		
	▪ Route selection to consider possible incidents along the way and suitable response, e.g., satellite tracking, mobile communication, 24/7 helpline response		
	▪ Standard dangerous goods requirements for Hazmat labels, Trem cards, driver trained in the hazards of the load.		
	▪ All necessary good hygiene practices to be in place, e.g., provision of toilets, eating areas, infectious disease controls.	▪ Developer ▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Policies and practice for dealing with known vectors of disease such as Aids, TB, COVID 19 and others.		
	▪ Awareness training for persons on site, safety		
	▪ Induction to include animal hazards		
	▪ First aid and emergency response to consider the necessary anti-venom, anti-histamines, topical medicines etc		
	▪ Due to isolated locations some distance from town, the ability to treat with anti-venom and extreme allergic reactions on site is critical to mitigate the impacts		
	▪ Acid resistant PPE (e.g., overalls, gloves, eyeglasses) to be specified for all operations in electrolyte areas		
	▪ All operators/maintenance staff trained in the hazards of chemicals on site.		
	▪ Batteries contained, modules contained and all inside a container that acts as bund		
	▪ Standard dangerous goods requirements for Hazmat labels		
	▪ All operators/maintenance staff trained in the hazards		
	▪ PPE to be increased (e.g., full-face shield, aprons, chemical suits) for operations that involve opening equipment and potential exposure, e.g., sampling, maintenance		
chronic exposure to toxic chemical or biological agents	▪ The operation and maintenance phase should be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993.	▪ Developer ▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ SHEQ policy in place.		
	▪ A detailed Risk Assessment of all normal operating and maintenance activities on site to be compiled, and form the basis of operating instructions, prior to commencing commissioning.		
	▪ SHE procedure in place, e.g., PPE specified, management of change, integrity monitoring. SHE appointees in place		
	▪ Training of staff in general hazards on site.		
	▪ All necessary health controls/ practices to be in place, e.g., ventilation of confined areas, occupational health monitoring if required and reporting programs in place		
	▪ Emergency response plan for full operation and maintenance phase to be in place prior to beginning commissioning and to include aspects such as: • appointment of emergency controller, • emergency isolation systems for electricity, • emergency isolation and containment systems for electrolyte, • provision of PPE for hazardous materials response, • provision of emergency facilities for staff at the main office building, • provision of first aid facilities, • first responder contact numbers		
	▪ Solid state batteries sealed, individual batteries in modules which are also sealed, pre-packed in the container		
	▪ Maintenance procedures will be in place should equipment need to be opened, e.g., pumps drained and decontaminated prior to repair in workshop etc. ▪		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ PPE will be specified for handling battery parts and other equipment on site ▪ Training of staff in hazards of chemicals on site. ▪ Possible detectors with local alarms if regulated occupational exposure limits are exceeded etc prior to entry for inspection of battery containers ▪ Labelling of all equipment. ▪ Confined space entry procedures if entering tanks. ▪ There need to be careful thought given to procedures to be adopted before entering into the BESS or a container particularly after a BMS shutdown where there may be flammable or toxic gases present, a fire etc. ▪ Safety Data Sheets (SDSs) to be available on site ▪ Operating manuals to be provided including start-up, shutdown, steady state, monitoring requirements ▪ Maintenance manuals with make safe, decontamination and repair procedures ▪ Proposed maintenance schedules e.g., checklists for weekly, monthly, annual etc ▪ Provided portable equipment for calibration and for testing/verification of defective equipment, e.g., volt/current meters, infrared camera		
Exposure to violent release of kinetic or potential energy	▪ The construction phase will be managed according to all the requirements of the Occupational Health and Safety Act 85 of 1993 specifically the Construction Regulations	▪ Project Manager ▪ EO	▪ Construction

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ SHEQ policy in place.	▪ Contractor ▪ ECO	
	▪ A detailed construction Risk Assessment prior to work		
	▪ SHE procedure in place		
	▪ PPE to be specified.		
	▪ SHE appointees in place.		
	▪ Contractors safety files in place and up to date		
	▪ SHE monitoring and reporting programs in place		
	▪ Standard construction site rules regarding traffic, reversing sirens, rigging controls, cordoning off excavations etc		
	▪ Civil and building structures to adhere to National Building Regulations and building Standards Act 103 of 1977 SANS 10400 and other relevant codes, and other constructions such as roads, sewers etc also to relevant SANS standards		
	▪ All normal procedures for working at heights, hot work permits, confined space entry, cordon off excavations etc to be in place before construction begins		
	▪ Emergency response plan to be in place before construction begins.		
	▪ Apart from pumps, no major moving parts during operation.	▪ EO ▪ Developer	▪ Operation
	▪ Maintenance equipment to be serviced and personnel suitably trained in the use thereof.		
	▪ Traffic signs, rules etc in place on site.		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ All normal working at heights, hot work permits, confined space entry, cordon off unsafe areas/works etc to be in place		
	▪ Emergency response plan must be present on site		
	▪ Civil design to take seismic activity into account.		
Exposure to electromagnetic waves	▪ Standard maintenance of condition of electrical equipment and safe operating instructions. Ability to shut off power to systems in use on site.	▪ Project Manager ▪ EO ▪ Contractor ▪ ECO	▪ Construction
	▪ If persons are decanting fuels or dealing with other highly flammable materials care should be taken regarding possible static discharge, installations to be suitably designed and maintained.		
	▪ Lightning strike rate in the study area is very high. Outside work must be stopped during thunderstorms.		
	▪ Lighting conductors may be required for the final installation, to be confirmed during design phase.		
	▪ Ability to shut off power to systems in use on site		
	▪ Codes and guidelines for electrical insulation	▪ EO ▪ Developer	▪ Operation
	▪ Suitable PPE to be specified.		
	▪ Low voltage equipment (e.g., batteries) separated from high voltage (e.g., transmission to grid).		
	▪ Ensure trained personnel and refer to guideline – IEE 1657 – 2018		
	▪ Ensure compliance with Eskom Operating Regulations for high voltage systems including access control, permit to work, safe work procedures, live work, abnormal and emergency situations, keeping records		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Software must be kept as update to date as reasonably practicable		
	▪ Consider suitably located Emergency stop buttons for the facility and the other equipment on site		
	▪ PPE to consider static accumulation for entering the facility, and particularly the battery containers especially after a high temperature shut down where there could possibly be flammable materials		
	▪ The procedures for responding to alarm and auto shut down on containers, needs to consider that there may be a dangerous environment inside and how to protect personnel who may enter to respond		
	▪ Lightning strike rate in proposed development area is very high. All outside work must be stopped during thunderstorms.		
	▪ Lighting conductors may be required for the installation, to be confirmed during design		
Emissions to air	▪ Use dampening on roads etc. as per normal construction practices.	▪ Contractor ▪ ECO	▪ Construction
	▪ Use specified PPE (dust masks) for specific construction work.		
	▪ Container could be treated as entering a confined space and similar procedures could be in place, e.g., do not enter alone, gas testing prior to entering, ensure adequate ventilation	▪ EO ▪ Developer	▪ Operation
Emissions to water	▪ Normal construction site practices for preventing and containing fuels/paint/oil etc spills must be practiced	▪ Contractor ▪ ECO ▪ EO	▪ Construction ▪ Operation
	▪ Bunding under any temporary tanks, curbing under truck offloading areas and sealed surfaces (e.g., concrete) under truck parking area is particularly important		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ Spill clean-up procedures to be in place before commencing construction		
	▪ Sewage and any kitchen liquids - containment and suitable treatment/disposal e.g. septic tank and soak away system		
	▪ Waste management plan to be in place e.g., liquid waste treatment or suitable removal and disposal will be provided.		
	▪ The National Environment Management Act (NEMA) has a list of substances with Reportable spill quantities, ensure compliance with this.		
Emissions to earth	▪ There will be packaging materials that will need to be disposed of after the entire system is connected and commissioned as well as after regular maintenance	▪ Contractor ▪ ECO	▪ Construction ▪ Operation
	▪ There will need to be waste segregation (e.g., electronic equipment, chemicals) and management on the site		
waste of resources e.g., water, power etc	▪ Water usage to be monitored on site during construction	▪ Contractor ▪ ECO	▪ Construction ▪ Operation
	▪ Handling protocols to be provided by battery supplier.		
	▪ End of Life plan needs to be in place before any battery containers enter the country as there may be damaged battery unit from day 1.		
	▪ Water management plan and spill containment plans to be in place.		
	▪ Adopt all mitigation measures as listed in the Visual Impact Assessment study		
	▪ Investigate end of Life plan for solid state batteries - reuse / recovery / reconditioning.	▪ Contractor ▪ ECO ▪ EO	▪ Operation

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
Financial risk	▪ Design by experienced contractors using internationally recognized and proven technology. Project management with deviation monitoring.	▪ Contractor ▪ ECO ▪ Developer	▪ Construction ▪ Operation
Security risk	▪ Fencing around electrical infrastructure to SANS standard and Eskom Guidelines.	▪ Contractor ▪ ECO ▪ Site manager	▪ Construction ▪ Operation
	▪ The hazardous nature of the electrical and battery equipment should be clearly indicated – e.g., Skull and Cross Bones or other signs		
	▪ Isolated location both helps and hinders security		
	▪ Night lighting to be provided both indoors and outdoors where necessary		
cyber security	▪ Cyber security needs monitoring.	▪ Developer ▪ EO	▪ Operation
	▪ Remote access to system needs to be negotiated and controlled		
	▪ Password controls, levels of authority etc. Protection of the National Electricity Grid from Cyber-attacks accessing through the BESS		
	▪ Cyber emergency procedures – should be in place prior to commissioning		
Security risk and Emergencies	▪ Emergency procedures need to be practiced prior to commencement of construction.	▪ Contractor ▪ ECO ▪ Developer	▪ Construction ▪ Operation
	▪ If batteries are stored at 50% charge, thermal runaway can happen while in storage on site waiting for installation. In addition, if involved in an external fire thermal run away can happen even with uncharged batteries. Except during shipping, ideally the units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	▪ The company in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of the persons involved in transfer and coordination of emergency response on-route		
	▪ Storage of spare batteries (e.g., in stores on site or elsewhere) also needs to consider possible thermal runaway.	▪ Eo ▪ Developer	▪ Operation
	▪ Escape doors should swing open outwards and not into the container. Doors should be able to be hooked open when persons are inside the container, i.e. they should not be automatically self-closing. ▪		
Legal impacts	▪ Use only internationally reputable battery suppliers who comply with all known regulations/guideline at the time of purchasing.	▪ Contractor ▪ ECO ▪ Developer	▪ Construction ▪ Operation
	▪ Ensure only state of the art battery systems are used and not old technologies prone to fires/explosions etc..		
Fires, explosions, toxic smoke, large spills, traffic accidents, equipment/structural collapse.	▪ Emergency procedures need to be practiced prior to commencement of construction.	▪ Contractor ▪ ECO ▪ Developer	▪ Construction
	▪ If batteries are stored at 50% charge, thermal runaway can happen while in storage on site waiting for installation. In addition, if involved in an external fire thermal runaway can happen even with uncharged batteries		
	▪ Except during shipping, ideally the units should not be stored any closer to each other than they would be in the final installation so that propagation is prevented, i.e. laydown area needs to be considered		
	▪ The company in charge of the containers at each stage in the transport process needs to be very clear so that responsibility for the integrity of the load and protection of the persons involved in transfer and coordination of emergency response on-route. E.g., if purchased from		

Activity/Aspect	Impact Management Actions/Measures	Responsible Person	Priority Timeframe
	Tesla where does hand over occur to the South African contractor / owner, at the factory door in USA, at the port in RSA, at the site fence. For example, who will be accountable if there's thermal runway event on a truck with a container that stops in a small town for driver refreshments		

8 MANAGEMENT PLANS

Several generic management plans have been included in the EMPr. The plans included below provide an indication of the requirements that must be followed on the proposed construction and operation of the Phefumula Emoyeni One WEF. It must be noted that many of these plans can be updated at any stage depending on any changes that may occur on the site.

The following specific plans have been compiled:

- Emergency Response Plan (ERP) (Section 8.1);
- Waste Management Plan (Section 8.2);
- Hazardous Substance Management Plan (Section 8.3);
- Fire Management Plan (Section8.4);
- Alien Invasive Plant Management Plan (Section8.5);
- Plant Rescue and Protection Plan (Section 8.6);
- Re-vegetation and Habitat Rehabilitation Plan (Section 8.7);
- Stormwater Management Plan (Section 8.8);
- Erosion Management Plan (Section 8.9);
- Traffic and Transport Management Plan (Section8.10);
- Fauna Management Plan (Section 8.11);
- Avifaunal Management Plan (Section 8.12);
- Soil Management Plan (Section 8.13);
- Heritage and Palaeontological Management Plan (Section 8.14);
- Grievance Mechanism (Section 8.15);
- HIV/AIDS Management Plan (Section 8.16);
- Chance Find Procedure (Section 8.14.1); and
- Security Policy (Section 8.17).

8.1 EMERGENCY RESPONSE PLAN

Appropriate resources must be provided to respond to accidental and emergency situations for operations and activities during construction and operation phases. The procedures will include plans for addressing training, resources, responsibilities, communication and all other aspects required to effectively respond to emergencies associated with their respective hazards.

This Emergency Response Plan (ERP) is intended as a practical working document for the proposed Phefumula Emoyeni One WEF. The purpose of this document is to provide the basic guidelines on how to respond to potential emergency situations that may arise during project activities. These potential emergency situations include medical emergencies and fires.

All activities associated with the project will require site-specific emergency response plans to mitigate impacts, which meet or exceed all applicable regulations.

The objectives of this plan are as follows:

- Protect the communities and the environment through the development of emergency response strategies and capabilities.
- Set out the framework for hazard identification in order to define procedures for response to the situations including the development of contingency measures.

- Structure a process for rapid and efficient response to and manage emergency situations during the construction and operational phases of the project.
- Assign responsibilities for responding to emergency situations.

The ERP must take the incident procedures referred to in Section 30 of the NEMA into account.

8.1.1 ROLES AND RESPONSIBILITIES

With respect to this plan, Phefumula Emoyeni One WEF (via the appointed EPC contractor/contractor/ principal contractor) has the responsibility to:

- Provide emergency response services (such as first aid and firefighting representative) and to structure and coordinate emergency response procedures for the project.
- Ensure that specific emergency responsibilities allocated to them are organised and undertaken.
- Ensure that employees and contractor third parties are trained and aware of all required emergency procedures.

8.1.2 EMERGENCY COMMUNICATIONS AND COORDINATION PLAN

In an emergency situation where there is an immediate threat to communities, personnel or the environment, the Project Manager will be notified immediately. The Project Manager will dispatch the Emergency Response Coordinator (or suitably tasked person) who will determine the appropriate plan of action depending on the severity of the emergency, the people affected, and the need to evacuate.

If there is a developing emergency or unusual situation, where an emergency is not imminent, but could occur if no action is taken, the Project Manager (or if the Project Manager is absent the Environmental Officer) is to be informed immediately. Once the emergency or unusual situation has been managed, the correct incident/near miss must be reported to the General Manager.

If an emergency situation poses a direct threat to communities in the area, the Environmental Officer and/or Social Officer will advise persons in the vicinity of the emergency to evacuate due to the potential risk. The appropriate government authorities will immediately be notified of such an emergency evacuation. The Emergency Response Coordinator (or suitably tasked person) will be tasked with responding to the potential risk. Should the emergency situation be such that it can be managed by Phefumula Emoyeni One WEF, equipment and personnel will be deployed to the maximum extent necessary, so as to prevent/minimise potential risks.

8.1.3 RESPONSE TO INCIDENTS

An incident is any occurrence that has caused, or has the potential to cause, a negative impact on people, the environment or property (or a combination thereof). It also includes any significant departure from standard operating procedures. The reporting and investigation of all potential and actual incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts because of all such incidents.

The actions resulting from any formal or informal investigations will be used to update the EMPr.

8.1.4 BUDGET FOR EMERGENCY RESPONSE

Costs for emergency response and management will be included in the capital expenditure budget for the construction phase and operational budget for the operational and decommissioning phases of the project.

8.1.5 VERIFICATION

An environmental emergency response system will be developed for the execution of emergency drills that will include the following, inter alia:

- Fire Drills
- Emergency Evacuation Drills
- Medical and Environmental Drills

Reporting and monitoring requirements for the plan will include:

- Monthly inspections and audits
- Quarterly reporting of accidents/ incidents
- Reporting at the time of the incident and monthly spill reporting developed by the Environmental and Quality, Health and Safety departments
- Bi-annual emergency response drills
- Annual reporting on training

Emergency response drills and reporting will be maintained by the Project Manager and will provide information regarding required revisions to training or the emergency response actions. Each incident reported will be reviewed and investigated upon occurring. Actions will be identified where possible to improve the site's overall response to emergencies. Updates/revisions that are necessary to protect worker or community health and safety will be implemented immediately after approval by the General Manager. On a bi-annual basis, Key Performance Indicators (KPIs) will be compared against past-performance and analysed for trends to determine if there are areas for improvement. Changes because of the trend analysis and identified areas for improvement will be implemented following the project's change management system as required.

8.2 WASTE MANAGEMENT PLAN

8.2.1 WASTE HIERARCHY

A waste is any solid, liquid or contained gaseous material that is being discarded by, disposal, recycling, burning or incineration. Waste management options for a particular waste need to be considered according to the Waste Management Hierarchy (**Figure 8-1**) which reflects the relative sustainability of each of the options. One of the key principles underlying the waste management hierarchy is to ensure that waste is dealt with as high up the waste hierarchy as possible. Since all waste disposal options have some impact on the environment, the only way to avoid impact is not to produce waste in the first place, and waste reduction is therefore at the top of the hierarchy. Re-use, followed by recovery techniques (recycling, composting and generating energy from waste) follow, while disposal to landfill or by incineration (the worst options) are at the bottom of the hierarchy.

In deciding on the most appropriate disposal route, both environmental and economic costs and benefits need to be considered. This decision must be reached taking into account all the costs and impacts associated with waste disposal, including those associated with the movement of waste.

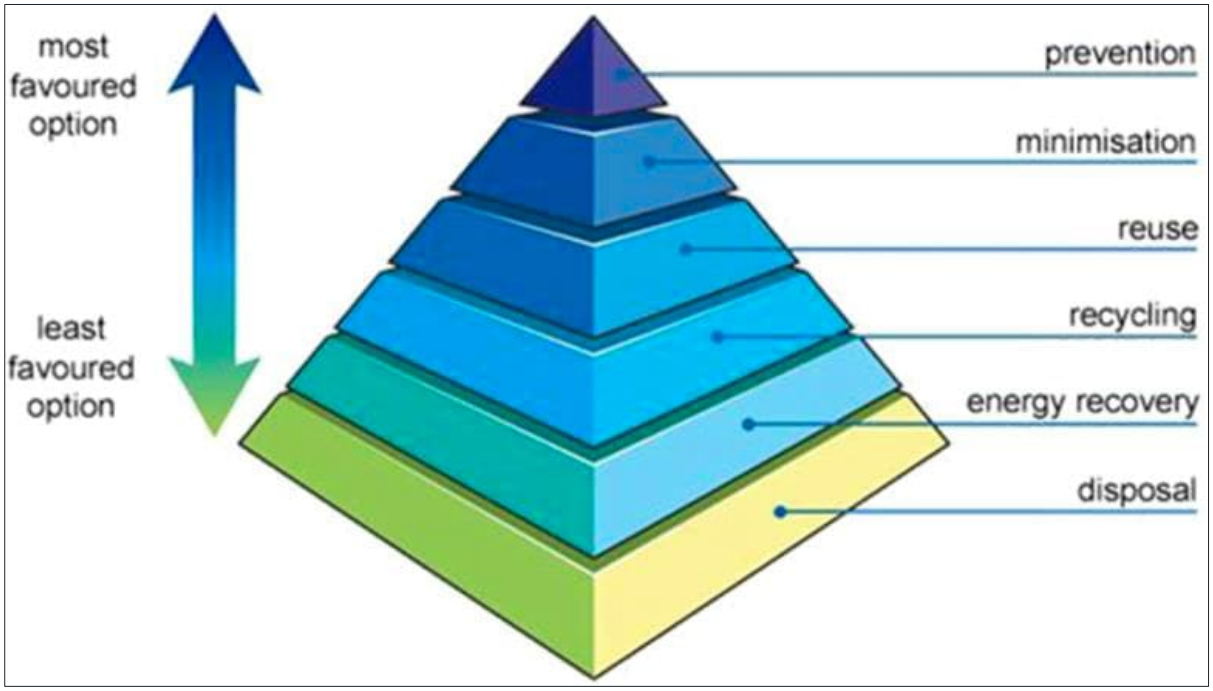


Figure 8-1: Waste Hierarchy

8.2.2 PROJECT STAGES

The purpose of this section is to assess the construction, operational processes of the proposed Phefumula Emoyeni One WEF in order to identify short comings, like raw materials procurement, infrastructure, employee training, health and safety, transportation, storage, compliance with legislative requirements, emergency preparedness and waste streams arising from an operation and its related activities, as well as the current waste management practices per waste stream. The assessment serves as the baseline against which any problem areas or gaps in waste management practises, process technology and environmental authorisations are identified and against which future performance objectives, activities and targets can be set.

The project stages are described below with the waste generation and management methods described in the corresponding tables below them including:

- Details on how waste will be managed during the construction and operational phases taking into consideration the waste management hierarchy;
- Details of the procedure for the separation of non-recyclable and recyclable waste;
- Details of the management of non-recyclable waste i.e. how waste will be stored on site during construction and operational phases, including the frequency for the removal of waste from the site and an indication of the landfill site where it will be disposed;
- Details for the management of recyclable waste e.g. the type of waste materials that will be recycled on site and the details pertaining to the offloading, sorting, handling, storage and collection procedures for the waste types (e.g. compaction and bailing, breaking of glass etc.); and
- The frequency for the removal of waste from the proposed development to where it will be finally managed must be included.

Waste Management at the project site will be undertaken in line with the EMPr to consider the correct disposal of general and hazardous waste generated on the project. **Table 8-1** describes the different

waste products that the proposed project will produce, as well as the various options to dispose of them. Waste will mainly be generated during the construction phase. During operation, contractors are only on the site for limited amount of time as and when maintenance is required.

Table 8-1 - Waste Management Options

Waste	Type of Waste	Management Options
Hydrocarbons (Contaminated soil)	Hazardous	▪ Fuel and oil spillages can be a source of contamination of water sources and the soil. Management options include: • Using spill kits to clean any spillages; • Ensure storage facilities are maintained and meet industry regulations; • Transportation and storage of fuel must be regulated and correctly managed according to the EMPr; • All hazardous waste is to be disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
Contaminated Personal Protective Equipment (PPE)	Hazardous	▪ PPE can be contaminated during handling of hydrocarbons. Management options include: • Store contaminated PPE in hazardous waste skips along the servitude; • Ensure contaminated PPE is disposed of at a registered hazardous landfill (safe disposal certificates must be obtained).
General waste	General	▪ General waste (inorganic matter) can be disposed of as per normal and form part of the municipal waste management system. Management options include: • Ensure waste is stored securely in refuse bins; • Co-ordinate waste removal with the general removal of waste from the contractor laydown area .
Food waste	General	▪ Food waste is generated as site personnel take their meals on the construction site. Management options include: • Store any waste and packaging into a labelled food waste bin; • Co-ordinate waste removal with the removal of waste from the contractor laydown area; and • Co-ordinate waste removal with the general removal of waste.

8.3 HAZARDOUS SUBSTANCES MANAGEMENT PLAN

Hazardous substances are chemicals or materials that can cause acute or chronic harm to health, be it humans or the environment. The key potential sources of impact related to the management of hazardous chemical substances (HCS) and fuel during construction relate to the risk of accidental release of hydrocarbons to the environment, accidental exposure to workers, and fire and explosion risks.

Potential impacts associated with these risks, if poorly managed, include:

- Impact to soil and/or groundwater, which may result in degradation of the resource and requirement for remedial action;
- Impacts on pastoralist livelihoods due to contamination of pasture or water resources and consequent impacts to their, health, livelihood and animals;
- Impacts on human health & safety due to either direct exposure or through fire/explosion;
- Gas emissions associated with the combustion of fuel, are mainly compounds of nitrogen, carbon including very small traces of sulphur and particulate matter; and
- Fugitive emissions from HCS & fuel storage.

The purpose of this Hazardous Substances Management Plan (HSMP) is to provide a framework for the management of hazardous substances onsite during the construction and operation of the Phefumula Emoyeni One WEF:

- Ensure the handling and storage of hazardous substances are in accordance with relevant standards;
- To ensure that the storage and handling of chemicals and hydrocarbons on-site does not cause pollution to the environment or harm to persons;
- To ensure that the storage and maintenance of machinery onsite does not cause pollution of the environment or harm to persons.

8.3.1 HAZARDOUS SUBSTANCES MANAGEMENT PROCEDURE

A plan for managing the transportation, delivery, storage and handling of hazardous substances onsite is detailed below. A method statement detailing the specific storage and handling practices during construction must be prepared by the Contractor prior to the commencement of construction.

REGISTER OF HAZARDOUS SUBSTANCES

Contractors shall establish inventories or registers of hazardous substances on site. The inventory is to be updated when new hazardous substances are introduced to the workplace, or the use of existing hazardous substances is discontinued. Both the chemicals' register and MSDSs must be readily available at a central location or near where the chemicals are being stored or used.

MSDS

It is standard practice that an MSDS is provided by the manufacturer or supplier of all hazardous substances. An MSDS is required for all chemicals and substances on site. These MSDSs are to be made available to all parties affected by the use or storage of the chemical. MSDSs are the key to communicating hazards and safe handling practices for chemicals. In addition, MSDS information is to be made available to all employees.

DELIVERIES

Transport of all hazardous substances must be in accordance with the relevant legislation and regulations. Contractors are responsible for identifying and securing any necessary permits for any proposed bulk fuel storage arrangements. The supplier will fill contractors fuel tanks; fuelling is the responsibility of the licensed contractor who will be supervised by the storage/work area supervisor. No 'black-market' or 'grey-import' fuels shall be used. All fuels purchased must be legitimate and subject to required duties and taxes.

Prior to fuel transfer the operator will verify that: all fuel transfer hoses have been connected properly and couplings are tight; transfer hoses are not obviously damaged; fuel transfer personnel are familiar

with procedures; for fuelling stations, personnel are located at both the fuel truck and fuel transfer tank(s) and have the ability to shut off fuel flow manually; a means of communication has been established between the two people transferring fuel; and a high liquid level shutoff device can be substituted for the person at the delivery tank, in which case operation of the shutoff will be verified each time it is used; The fuel contractor will clean up and report any accidents or spills immediately to the project ESHS team.

ENVIRONMENT AND OCCUPATIONAL HEALTH AND SAFETY

The following requirements are additional to any applicable requirements established in other LTWP management plans such as the Occupational Health & Safety Management Plan:

- Storage facilities will have the applicable MSDS available;
- Smoking will be strictly prohibited from any areas where fuel loading operations take place;
- Appropriate signage will be used to identify potential spill risks;
- Any accidental damage to containment structures will be inspected immediately and appropriate repairs undertaken. The extent of damage will be reported in writing to WP as well as remedial repairs effected together with the date of repairs and any follow up inspection. Any release of fuels or other substance will be cleaned up;
- All used fuel / oil products will be collected in tanks marked “Waste Oil”; and
- All hydrocarbon associated wastes will be managed in line with the Waste Management Plan.

MATERIALS STORAGE

- All temporary hydrocarbon storage will be situated above ground. There will be no buried storage tanks permitted.
- All chemicals, fuels and other hazardous materials are to be stored in designated and bunded areas, where the bunded area is impermeable and is impervious to the stored substance as per the requirements of SABS 089:1999 Part 1. The bunded area will contain 110% volume of the largest container stored.
- Bunds and service area platforms to be cleaned and maintained regularly.
- SABS approved Spill kits must be made available on-site for the clean-up of spills and leaks of contaminants. The relevant construction crew members must be trained in their use.
- Keep a record of all hazardous substances stored on site. Clearly label all the containers storing hazardous waste.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded, and stored in compliance with MSDSs files and applicable regulations and safety instructions.
- Chemical and hydrocarbon storage facilities shall be covered to prevent rainfall ingress into secondary containment units and well-ventilated
- Any storage and disposal permits/approvals which may be required must be obtained, and the conditions attached to such permits and approvals will be compiled with.
- An effective monitoring system must be put in place to detect any leakage or spillage of all hazardous substances during their transportation, handling, installation and storage.

SPILL AND LEAK MANAGEMENT AND PREVENTION

- In the event of a major spill or leak of contaminants, the relevant authorities must be informed. The relevant construction crew members must be trained in their use.

- Spilled cement must be cleaned up immediately and, stored as hazardous waste and disposed of at a suitably licensed hazardous waste disposal facility.
- Routine servicing and maintenance of vehicles must not be undertaken onsite (except for emergencies). If repairs of vehicles must take place, an appropriate drip tray must be used to contain any fuel or oils.
- Any water that collects in bunds must not be allowed to stand. Should the water be contaminated, it is to be removed and treated prior to discharge, or disposed of as hazardous waste. Clean stormwater contained within the bunds may be reused.
- No chemicals must be stored, or vehicle maintenance undertaken within 100m of wetlands or drainage lines.
- Construction machinery must be stored in an appropriately sealed area. If machinery cannot be stored in a sealed area, then a drip tray must be used to prevent spillage from any leaks.
- As far as practicable, all equipment servicing / maintenance shall be undertaken within designated workshop areas.
- All generators on site, including generators that are not in use must be located in a bunded area or on a drip tray.
- Bunded areas and drip trays must be maintained on a regular basis.
- Diesel generators and water pumps shall be located in secondary containment areas or shall be self-contained to prevent loss of fuels and oils;
- Precautions must be in place to limit the possibility of oil and other toxic liquids from entering the soil or clean stormwater system.
- Upon completion of construction, the area must be cleared of potentially polluting materials.
- Emergency response planning will be managed via the Emergency Preparedness and Response Plan.

8.3.2 OPERATIONAL PHASE

During the operational phase of the project limited hazardous substances and chemicals will be stored onsite. During maintenance activities, contractors will need to produce a method statement detailing the specific storage and handling practices. The following measures need to be implemented onsite during the operational phase of the project.

- Hazardous substances must be stored in sealed containers within a clearly demarcated designated area.
- Care must be taken to ensure that spillage of oils and other hazardous substances are limited during maintenance. Handling of these materials must take place within an appropriately sealed and bunded area.
- Should any accidental spillage take place, it must be cleaned up according to specified standards regarding bioremediation.
- The storage of flammable and combustible liquids such as oils will be in designated areas which are appropriately bunded and stored in compliance with MSDSs files and applicable regulations and safety instructions.
- Used oils and chemicals:
- Appropriate disposal must be arranged with a licensed facility in consultation with the administering authority;
- Waste must be stored and handled according to the relevant legislation and regulations.

8.3.3 INSPECTION, MONITORING AND TRAINING

Fuel storage areas must be inspected regularly to ensure bund stability, integrity, and function.

The contents of the Hazardous Substances Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the relevant Training Procedure.

Examples of Toolbox Talks include:

- Storage of hazardous substances
- Working with hazardous substances
- Management of hazardous waste
- Spill Prevention

8.4 FIRE MANAGEMENT PLAN

The purpose of this plan is to address firefighting requirements throughout the construction of the project and to preserve and protect human life as well as tangible goods and equipment in the event of a fire.

Mitigation and management measures include, but are not limited to the following:

- All construction camps shall be provided with portable fire extinguishing equipment, in accordance with all relevant legislation and must be readily accessible.
- The Contractor shall take specific measures to prevent the spread of veld fires, caused by activities at the campsites. These measures must include appropriate instruction of employees about fire risks and designated smoking areas.
- Fire prevention facilities must be present at all storage facilities. No open fires shall be allowed on site under any circumstance. No cooking on open fires shall be done onsite to prevent runaway fires.
- The Contractor shall have operational fire-fighting equipment available on site at all times. The level of firefighting equipment must be assessed and evaluated through a typical risk assessment process.
- Emergency numbers for local police and fire department etc. must be placed in a prominent area.
- Firefighting equipment must be placed in prominent positions across the site where it is easily accessible. This includes fire extinguishers, a fire blanket as well as a water tank.
- All construction staff must be trained in fire hazard control and firefighting techniques. Translators are to be used where necessary.
- All flammable substances must be stored in dry areas which do not pose an ignition risk to the said substances.
- Smoking must only be conducted in demarcated areas.
- Firefighting equipment must be regularly maintained by a suitable service provider.

8.5 ALIEN INVASIVE PLANT MANAGEMENT PLAN

The purpose of this Plan is to provide a framework for the management of alien and invasive plant species during the construction and operation of the project, which in turn serves to manage open spaces, as required.

APPROACH:

Alien Invasive Species (AIS) establishment and colonisation can be highly dynamic. New sites can be rapidly colonised, and new alien species can abruptly emerge and become problematic. It is therefore important that the AIS Control and Eradication Plan be viewed as a dynamic management framework, that in all likelihood, will need to be revised and updated during the various phases of the Project based on-site conditions and the findings of regular monitoring.

The broad objectives of the plan include the following:

- Ensure alien plants do not become dominant in parts or the whole site through the control and management of alien and invasive species presence, dispersal and encroachment.
- Managing and maintaining the ecosystem in a near-natural state and restoring and/or rehabilitating the ecosystems to such a state.
- Develop and implement a monitoring and eradication programme for alien and invasive species.
- Promote the natural re-establishment and planting of indigenous species in order to retard erosion and alien plant invasion.

Mitigation and management measures include, but are not limited to the following:

- Monitor for early detection, to find species when they first appear on site. This should be as per the frequency specified in the management plan and should be conducted by an experienced botanist. Early detection should provide a list of species and locations where they have been detected. Summer (vegetation maximum growth period) is usually the most appropriate time, but monitoring can be adaptable, depending on local conditions.
- Monitor for the effect of management actions on target species, which provides information on the effectiveness of management actions. Such monitoring depends on the management actions taking place. It should take place after each management action.
- Monitor for the effect of management actions on non-target species and habitats.
- Stockpiles must be kept clear of weeds and alien vegetation growth by regular weeding.
- Alien vegetation and the spread of exotic species on the site will need to be controlled.
- The contractor must be responsible for implementing a programme of weed control (particularly in areas where soil has been disturbed); and grassing of any remaining stockpiles to prevent weed invasion.
- Herbicide use shall only be allowed according to contract specifications. The application shall be according to set specifications and under supervision of a qualified technician. The possibility of leaching into the surrounding environment shall be properly investigated and only suitable herbicides shall be used.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation. Use of these should only be permitted where absolutely necessary.
- Correct rehabilitation with locally indigenous species.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.
- Constant maintenance of the area to ensure re-colonisation of floral species.
- Ensure regular removal of alien species, which may otherwise jeopardise the proliferation of indigenous species.

MECHANICAL CONTROL:

- Mechanical control involves the physical removal of the alien plants. Hand pulling is highly effective against young seedlings that are shallow rooted and that occur in low densities (Coetzee, 2005);
- For larger or mature plants, the physical cutting back or felling (cut stump) of the plant is most effective. This can be done using machetes, axes, brush cutters or saws. In many instances, felled plants will coppice, so it is important that follow-up cutting back is coupled with the application of herbicide to kill any re-growth (Coetzee, 2005). The application of herbicide on cut stumps immediately after felling is an effective means of preventing coppicing;
- Ring-barking is also effective against mature alien trees. This method relies on the removal of bark, including the cambium layer, around the trunk of a tree using an axe or a saw. The ring-barked area should also be treated with an herbicide (Coetzee, 2005); and
- Frilling is similar to complete ringbarking and involves severely damaging the bark of a tree. Repeated cuts are made into a section of bark with an angled strike of an axe or slasher. The resulting 'frill' is then treated with an herbicide (Coetzee, 2005).

CHEMICAL CONTROL:

Chemical control involves the application of a suitable herbicide in order to kill the target plant. Herbicides are classed as follows:

- Contact herbicides are those that affect the plant part directly sprayed with the herbicide (Bromilow, 2010);
- Systemic herbicides are those that get absorbed by the plant and are transported throughout the plant's tissues. Systemic herbicides may have a long residual action - acting for months to years, or short residual action - acting over a couple of days (Bromilow, 2010); and
- Selective herbicides target specific plant species or plant groups (dicotyledonous vs monocotyledonous plants), while non-selective herbicides will harm or kill any plant they come into contact with (Bromilow, 2010).

All herbicide mixtures should be prepared and used in strict compliance with the manufacturer's instructions. The chemical concentrate (herbicide) will generally be added to water or a hydrocarbon solvent at a concentration recommended by the manufacturer for a specific application. Many herbicides are toxic to humans and wildlife so they must be handled and used responsibly, and with the requisite personal protective equipment (PPE).

Liquid herbicides are typically applied using a suitable water sprayer or paint brush, to which a dye is often added to distinguish plants that have been treated. Herbicide is sprayed or painted directly onto the foliage or exposed stumps and stem notches of the target plants.

Alternatively, herbicides can also be applied to the soil in the form of pellets. These are gradually broken down, assimilated into the soil and eventually taken up by plant roots. Another application method, specific to larger plant specimens, involves the insertion of an herbicide plug into the base of a target plant.

SCHEDULING:

General considerations for the implementation of AIS control:

- AIS control should commence during the Project's construction phase;

- AIS control should be conducted during the middle of the wet/growing season (i.e., November to January) to ensure the emergence/visibility of most plants, but ideally prior to mass plant seeding and dispersal;
- All plants growing at a particular site should be treated/controlled, before moving to the next site;
- After the initial control phase, annual follow-up treatments should be conducted. These should be:
    - Informed by the findings of monitoring;
    - Conducted during the middle of the wet/growing season;
    - Target new emergent seedlings and/or any coppice growth.

Scheduling is largely contingent on available funds. However, considering the relatively small size of the anticipated disturbance footprints and the likely dominance of small herbaceous species, it is expected that AIS control can be implemented across all management units during the first two years of roll-out. Thereafter, the scheduling of where to implement control should be determined based on the findings of monitoring.

RESPONSIBILITIES, MONITORING AND REPORTING

- Appointment of Implementation Officer:

The implementation of the AIS Control and Eradication Plan can either be outsourced to a suitably experienced service provider or conducted internally. If the decision is taken to implement the plan internally, it is important that a trained, experienced individual be appointed to manage or oversee the implementation process. It is envisaged that the AIS Implementation Officer should have the following attributes:

- Experience in managing teams of workers;
- Practical knowledge in the use of clearing equipment, such as axes, slashers, saws, as well as in the mixing and application of herbicides;
- Basic understanding of plant identification, with particular training in recognising AIS;
- Ability to conduct monitoring and draft monitoring reports; and
- Ability to refine or adapt treatment methods to improve effectiveness.

- Recommended AIS Monitoring Programme:

Monitoring is a critical component of AIS management. By gauging the efficacy of control methods, monitoring can be used to compare historic and current control methods, highlight the need/ desirability of modifying or improving control methods, and identify new sites of infestation or emergent alien species. It is therefore recommended that:

- Monitoring should be conducted on an annual basis and during the mid- to late wet/growing season;
- The AIS Implementation Officer or an Environmental Control Officer (ECO) should be responsible for conducting monitoring;
- Monitoring should focus on:
- Treated areas to determine the efficacy of control actions and highlight the need for follow-up treatments;
- Areas that have been or are being disturbed by earth works, as this is where alien species establishment is most likely; and
- Riparian/wetland habitat.

- Status Reporting and Plan Adaptation

Data collected during monitoring should be presented in annual monitoring reports. The reports should include the following information, at a minimum:

- Comparisons with previous monitoring data;
- Identification of future target sites for AIS control;
- Recommendations to improve control actions; and
- A photographic record of treated areas to use for long term comparisons.

8.6 PLANT RESCUE AND PROTECTION PLAN

The purpose of the plant rescue and protection plan is to implement avoidance and mitigation measures, in addition to the mitigation measures included in the EMPr to reduce the impact of the development of the project on listed and protected plant species and their habitats, and to provide guidance on search and rescue of species of conservation concern.

PROTECTED FLORA SPECIES OCCURRING ON-SITE AND THE PERMIT APPLICATION PROCESS:

- According to Mpumalanga Nature Conservation Act (No. 10 of 1998), in order to a rescue and relocate a flora species listed as Protected, a permit must be obtained from the Mpumalanga Parks and Tourism Agency (MPTA);
- Prior to vegetation clearing, the ECO for the Project should traverse on foot the marked development footprint in a grid-like fashion. All protected plants occurring within the footprint and that will be impacted by vegetation clearing should be identified and their number (population size) and co-ordinates recorded;
- These data should then be used to inform a permit application which should be submitted along with the required fee to the MPTA.

RESCUE AND RELOCATION PROCEDURE:

The following points summarise the key steps to manually rescue protected plants from the development footprints and relocate them to a safe adjacent location:

- Individual plants that require rescuing should be extracted from the ground using a gardening pick and a shovel. Efforts should be made to minimise damage to plant roots and or bulbs during the extraction process;
- Rescued plants should then be replanted in newly excavated holes at nearby/adjacent locations of similar habitat (e.g., plants rescued from wetland habitat, should be relocated to adjacent areas of wetland habitat);
- The soil/rock medium at the bottom of each newly excavated planting hole should be loosened prior to planting to facilitate root penetration; and
- Where possible, each relocated plant should also be watered immediately after out-planting to promote acclimation and survival.

RECORD KEEPING:

- It is recommended that a record of all relocated protected plants should be kept in order to monitor plant survival and thereby inform improvements to any future relocation process;
- Information that should be documented in the record include:

- Species name;
- Number of relocated plants;
- Co-ordinates of relocated plants; and
- Date of relocation.

MITIGATION AND MANAGEMENT MEASURES:

Mitigation and management measures include, but are not limited to the following:

- The location of all transplanted rescued plants must be recorded, along with the identity of the plant.
- The health / vigour of each transplanted individual should be monitored as per the frequency and duration specified in the management plan.
- As a scientific control, an equal number of non-transplanted individuals of the same species, within similar habitats, should be monitored in the same way as the transplanted specimens. This will provide comparative data on the survival of wild populations relative to transplanted plants.
- If populations of threatened plant species are found to occur on site, annual monitoring of population health should take place. This should be appropriate to the species concerned.
- Vegetation clearing must only commence after a walk down has been conducted by a suitably qualified person and the necessary permits obtained.
- Vegetation clearing to be kept to a minimum. No unnecessary vegetation to be cleared.
- Vegetation removal must be limited to the construction site and must be removed only as it becomes necessary rather than removing all the vegetation throughout the site at once.
- Materials must not be delivered to the site prematurely which could result in additional areas being cleared or affected.
- No vegetation to be used for firewood.
- Gathering of firewood, fruit, medicinal plants, or any other natural material onsite or in areas adjacent to the site is prohibited unless with prior approval of the ESCO.
- Construction site office and laydown areas must be clearly demarcated and no encroachment must occur beyond demarcated areas.
- All natural areas impacted during construction must be rehabilitated with locally indigenous plant species or grassed accordingly.
- The use of pesticides and herbicides on the site must be discouraged as these can impact on important pollinator species of indigenous vegetation. Use of these should only be permitted where absolutely necessary.
- Soil stockpiles must not become contaminated with oil, diesel, petrol, garbage or any other material, which may inhibit the later growth of vegetation in the soil. Spillage can result in a loss of soil functionality thus limiting the re-establishment of flora.
- It is a legal requirement to obtain permits for specimens or protected species that will be lost due to construction of the project.
- A detailed pre-construction walk-through survey will be required during a favourable season where possible, to locate any individuals of protected plants, as well as for any populations of threatened plant species. This survey must cover the footprint of all approved infrastructure, including internal access roads and substations. The best season is early to late Summer if possible, taking administrative processes into account, but will be influenced by recent rainfall and vegetation growth.

- It is possible that some plants lost to the development can be rescued and planted in appropriate places in rehabilitation areas, but the description and appropriateness of such measures must be included in a Plant Rescue Plan. Any such measures will reduce the irreplaceable loss of resources as well as the cumulative effect. Note that Search and Rescue is only appropriate for some species and that a high mortality rate can be expected from individuals of species that are not appropriate to transplant.
- Prior to construction commencing, a Plant Rescue Plan must be compiled to be approved by the appropriate authorities as part of the EMPr approval.
- For any plants that are transplanted, annual monitoring should take place to assess survival. This should be undertaken as per the frequency specified in the management plan and be undertaken by a qualified botanist. The monitoring programme must be designed prior to translocation of plants and should include control sites (areas not disturbed by the project) to evaluate mortality relative to wild populations.
- No collecting or poaching of any plant species.

Rescued plants

- The location of all transplanted rescued plants must be recorded, along with the identity of the plant.
- The health / vigour of each transplanted individual should be monitored as per the frequency and duration specified in the management plan.
- As a scientific control, an equal number of non-transplanted individuals of the same species, within similar habitats, should be monitored in the same way as the transplanted specimens. This will provide comparative data on the survival of wild populations relative to transplanted plants.

Threatened species

- If populations of threatened plant species are found to occur on site, annual monitoring of population health should take place. This should be appropriate to the species concerned.

For permitting purposes, the following flora survey is required prior to construction activities taking place:

- Detailed floristic walk-through survey of all footprint areas in order to document composition, especially of protected species. It is suggested this be undertaken after an appropriate time-period after rainfall, where possible, to allow emergence of any species of potential concern. The survey must also cover all footprint areas, including final road alignments. Renewable energy projects similar to the one assessed here tend to have high fluidity in terms of layout and technology, due to the current rapid evolution of the technology, which allows more efficient deployment of infrastructure. However, this means that “final” layouts regularly change. The walk-through survey:
- Must assess the footprint that will be constructed – if this changes then the new footprint areas must be subject to a walk-through survey in full.
- Must be undertaken in the correct season, if possible, taking administrative processes into account.
- Must be adequately resourced to ensure it is done properly.
- Must be undertaken by a competent botanist.

8.7 RE-VEGETATION AND HABITAT REHABILITATION PLAN

The purpose of the rehabilitation plan is to ensure that areas cleared or impacted during construction activities are rehabilitated with a plant cover that reduces the risk or erosion from these areas as well

as restores some ecosystem function. The purpose of the rehabilitation plan for the site can be summarised as follows:

- Achieve long-term stabilisation of all disturbed areas to minimise erosion potential.
- Re-vegetate all disturbed areas with suitable local/indigenous plant species or grass/crop.
- Minimise visual impact of disturbed areas.
- Ensure that disturbed areas are safe for future uses.

TIMEFRAMES FOR IMPLEMENTATION:

- Rehabilitation actions should be implemented during the rainy season, as soon as the construction phase ends, and all construction vehicles and equipment have been removed from the site;
- After initial rehabilitation and revegetation efforts, it may be necessary to implement periodic follow-up or remedial treatment at certain sites during the operational phase of the Project in order to improve vegetation cover and stability. The need for this, should be informed by monitoring; and
- During the decommissioning phase of the Project, it will also be necessary to conduct rehabilitation and revegetation at all sites where Project infrastructure has been dismantled and removed.

RECOMMENDED REHABILITATION MEASURES:

- Topsoil Stripping and Stockpiling:
  - During the construction phase, topsoil should be stripped from the development footprints and stockpiled locally, i.e., adjacent to construction footprints;
  - To ensure the continued viability of the seedbank contained within stripped topsoil, the topsoil stockpiles should not exceed 1.5 m in height and should not be compacted; and
  - If required, topsoil stockpiles should be kept clear of AIS.
- Site Stabilisation and Preparation:
  - During rehabilitation, all compacted soils at disturbed sites should be ripped or disced to loosen the soil, increase water infiltration, promote seed penetration and enhance germination potential;
  - All disturbed sites should also be correctly contoured and stabilised to reduce erosion potential. At sites where there is a high potential for erosion, such as steep slopes, additional anti-erosion measures, such as the placement of geotextiles, should be considered to bind soil and encourage vegetation growth; and
  - Stripped topsoil should then be evenly applied across disturbed sites to provide a productive growth medium.

ACTIVE REVEGETATION OF DISTURBED SITES

- To facilitate the timeous establishment of suitable vegetation cover, it is recommended that active grass seeding be conducted;
- A grass seed mix should be broadcast across the top soil layer and lightly integrated into the top soil layer; and
- To facilitate spreading/broadcasting of seed across the disturbed area, it is recommended that the grass seed mixture should be blended with a spreading agent, such as river sand, bran, or a mixture of agricultural lime and granular fertilizer, at a ratio of 1:1. It is important that seed and spreading agent are blended evenly to ensure a uniform mix of seed in the material.

RECOMMENDED REHABILITATION MONITORING PROGRAMME

The ongoing monitoring of rehabilitated sites is important to assess the effectiveness of the implemented rehabilitation measures and to inform revisions or improvements thereof. It is recommended that monitoring should be conducted on an annual basis during the mid- to late wet/growing season until such a time as monitoring indicates that rehabilitation has been successful. Monitoring should focus on all rehabilitated sites, with a focus on:

- Vegetation coverage;
- General species composition (indigenous vs alien/exotic species and pioneer vs subclimax and climax species);
- Presence of listed AIS; and
- Evidence of erosion.

The findings of monitoring should guide any revisions or improvements of the rehabilitation procedures.

PERFORMANCE TARGETS

Key performance targets at each site where rehabilitation has been implemented include:

- No substantive erosion or areas denuded of vegetation cover;
- Viable self-sustaining vegetation coverage of locally occurring indigenous grasses; and
- Minimal- to no establishment of listed AIS.

MITIGATION AND MANAGEMENT MEASURES:

Mitigation and management measures include, but are not limited to the following:

- Rehabilitation Plan must be compiled by an approved ecologist prior to the start of construction and decommissioning.
- All management actions associated with rehabilitation must be recorded after each management action has taken place.
- All rehabilitated areas should be monitored to assess vegetation recovery. This should be for a minimum of three years after post-construction rehabilitation but depends on the assessed trajectory of rehabilitation (whether it is following a favourable progression of vegetation establishment or not – this depends on the total vegetation cover present, and the proportion that consists of perennial growth of desired species). For each monitoring site, an equivalent comparative site in adjacent undisturbed vegetation should be similarly monitored. Monitoring data collection should include the following:
  - total vegetation cover and height, as well as for each major growth form;
  - species composition, including relative dominance;
  - soil stability and/or development of erosion features;
  - representative photographs should be taken at each monitoring period.
- Monitoring of rehabilitated areas should take place at the frequency and for the duration determined in the rehabilitation plan, or until vegetation stability has been achieved.
- Re-vegetation must aim to accelerate the natural succession processes so that the plant community develops in the desired way, i.e. promote rapid vegetation establishment.

- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with suitable crop or locally indigenous species typical of the representative botanical unit.
- Re-vegetation of the disturbed site is aimed at approximating as near as possible the existing vegetative conditions prevailing prior to construction.
- Seeds from surrounding seed banks can be used for re-seeding.
- Rehabilitation must be executed in such a manner that surface run-off will not cause erosion of disturbed areas.
- Planting of indigenous tree species in areas not to be cultivated or built on must be encouraged.
- Habitat destruction must be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads. In this respect, the recommendations from the Biodiversity Assessment must be applied strictly. Personnel must be adequately briefed on the need to restrict habitat destruction, and must be restricted to the actual construction area.
- Monitoring programme to ensure that rehabilitation efforts are successful to ensure that risks such as erosion, spread of exotic species and the edge effect are avoided.

8.8 STORMWATER MANAGEMENT PLAN

The main principles in stormwater management include:

- Confine or divert any unpolluted water to a 'clean' water system, and polluted water to a 'dirty' water system;
- 'Clean' and 'dirty' water systems must be designed and constructed to prevent cross-contamination between the 'clean' and 'dirty' water systems; and
- Appropriate maintenance and management of storm water related infrastructure.

The proposed water systems or infrastructure are to be designed to prevent any potential contamination of natural water resources in the area.

A Storm Water Management and Surface Water Protection Plan cannot be compiled until the detailed designs are complete. It is stipulated in this EMPr that a Storm Water Management Plan must be compiled before any construction commences and implemented during the construction phase. This plan must indicate how all surface runoff generated as a result of the project and associated activities (during both the construction and operational phases) will be managed prior to entering any natural drainage system or wetland and how surface water runoff will be retained outside of any demarcated buffer zones and subsequently released to simulate natural hydrological conditions.

A Storm Water Management Plan will be required to support the relevant facility processes. A stormwater management plan must be developed in the preconstruction phase, detailing the stormwater structures and management interventions that must be installed to manage the increase of surface water flows directly into any natural systems. The stormwater control systems must be inspected on an annual basis to ensure these are functional. Effective stormwater management must include effective stabilisation (gabions, Reno mattresses or similar) of exposed soil and the re-vegetation of any disturbed water courses.

8.9 EROSION MANAGEMENT PLAN

Exposed and unprotected soils are the main cause of erosion in most situations. Therefore, this erosion management plan and the revegetation and rehabilitation plan are closely linked to one another and should not operate independently but should rather be seen as complementary activities

within the broader environmental management of the site and should therefore be managed together. This Erosion Management Plan addresses the management and mitigation of potential impacts relating to soil erosion, including:

- Material stockpiled for long periods (2 weeks) must be retained in a bermed area.
- Stockpiles not used in three (3) months after stripping must be covered with hessian or a similar material to prevent dust and erosion.
- Sensitive areas need to be identified prior to construction so that the necessary precautions can be implemented.
- Any vegetation clearance must be phased to ensure that the minimum area of soil is exposed to potential erosion at any one time.
- Areas to be cleared must be clearly demarcated and this footprint strictly maintained.
- Silt fences and erosion control measures must be implemented in areas where these risks are more prevalent.
- Wind screening and stormwater control must be undertaken to prevent soil loss from the site.
- Other erosion control measures that can be implemented are as follows:
    - Brush packing with cleared vegetation
    - Mulch or chip packing
    - Planting of vegetation
    - Hydroseeding / hand sowing
- All erosion control mechanisms need to be regularly maintained.
- Seeding of topsoil and subsoil stockpiles to prevent wind and water erosion of soil surfaces.
- Re-vegetation of disturbed surfaces must occur immediately after construction activities are completed. This must be done through seeding with indigenous grasses.
- No impediment to the natural water flow other than approved erosion control works is permitted.
- To prevent stormwater damage, the increase in stormwater run-off resulting from construction activities must be estimated and the drainage system assessed accordingly.

8.9.1 MONITORING

The site must be monitored continuously during construction and operation in order to determine any indications of erosion. If any erosion features are recorded as a result of the activities on-site the Environmental Officer (during construction) or Site Manager (during operation) must:

- Assess the significance of the situation.
- Take photographs of the soil degradation.
- Determine the cause of the soil erosion.
- Inform the contractor/operator that rehabilitation must take place and that the contractor/operator is to implement a rehabilitation method statement and management plan.
- Monitor that the contractor/operator is taking action to stop the erosion and assist them where needed.
- Report and monitor the progress of the rehabilitation weekly and record all the findings in a site register.
- All actions with regards to the incidents must be reported on a monthly compliance report which will be submitted to the Competent Authority (during construction) and kept on file for consideration during the annual audits (during construction and operation).

The Contractor (in consultation with an appropriate specialist) must:

- Select a system/mechanism to treat the erosion.
- Design and implement the appropriate system/mechanism.
- Monitor the area to ensure that the system functions like it should. If the system fails, the method must be adapted or adjusted to ensure the accelerated erosion is controlled.
- Continue monitoring until the area has been stabilised.

8.10 TRAFFIC AND TRANSPORT MANAGEMENT PLAN

The purpose of a Traffic and Transportation Management Plan is to address regulatory compliance, traffic management practices, and protection measures to help reduce impacts related to transportation and the construction of temporary and long-term access within the vicinity of the project site. The objectives of this plan include the following:

- To ensure compliance with all legislation regulating traffic and transportation within South Africa National, Provincial, Local and associated guidelines.
- To avoid incidents and accidents while vehicles are being driven and while transporting personnel, materials, and equipment to and from the project site.
- To raise greater safety awareness in each driver and to ensure the compliance of all safe driving provisions for all the vehicles.
- To raise awareness to ensure drivers respect and follow traffic regulations.
- To avoid the deterioration of access roads and the pollution that can be created due to noise and emissions produced by equipment, machinery, and vehicles.

Mitigation and management measures include, but are not limited to the following:

- All vehicles used during the transport of materials and in the construction activities are required to be roadworthy per the National Road Traffic Act (NRTA) and display all pertinent certificates as required.
- All vehicles travelling to and from the site shall adhere to all laws imposed by the law enforcement agencies, and shall comply with any requests made by the law enforcement officials.
- For each convoy of abnormal vehicles/loads a designated safety officer shall be nominated. All abnormal vehicles and loads to be transported are required to have a valid permit before any trip is begun.
- The route must be assessed to determine if any structures or vegetation need to be temporarily or permanently relocated so as to avoid damage to the load as well as public and private property during the trips.
- A designated transport coordination manager must be appointed to oversee and manage the traffic safety officers. Additionally, the designated transport coordination manager must inform and keep up-to-date the interested and affected parties of all the activities taking place that may have a direct impact on them.
- A traffic safety officer shall be nominated to make all the necessary arrangements to maintain the required traffic measures for the duration of the project as outlined in the “Standard Specifications for Road and Bridge Works for State Road Authorities,’ 1998 edition. The safety officer shall liaise daily with the transportation coordination manager to keep them apprised of the state of all the traffic arrangements.
- All construction vehicles that are entering the site shall also be available via radio or telephone communication to the transport coordination manager. So that in the event of an emergency, all vehicles can be accounted for.

- All vehicles shall comply with the posted speed limits on public roads as well as the speed limits within the development. For additional speed limits that are imposed on the construction traffic, refer to the South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 for the restrictions.
- All construction traffic shall comply with the legal load requirements as outlined in the National Road Traffic Act and National Road Traffic Regulations.
- Construction traffic entering the site along public roads must be limited to times when peak hour traffic can be avoided. The peak traffic occurs during 7h00 to 8h30, and 16h00 to 17h30.
- The South African Road Traffic Signs Manual (SARTSM), Volume 2, June 1999 is to be used for all traffic during the construction activities of the proposed project.
- During periods of high construction traffic entering and exiting the site, it is recommended that flagmen help direct the traffic. This will enable the safe movement of construction and public traffic at the entrance and reduce the number of potential conflicts.

8.11 FAUNA MANAGEMENT PLAN

The purpose of this fauna management plan is to protect species, habitats and eco-system services, ensuring no net reduction to any critically endangered / endangered species and no net loss of any critical habitats (as defined by IFC Performance Standard 6) whilst minimising disturbance to other species and habitats to the extent practicable. This plan provides a strategy to control potential impacts on fauna during the construction and operation of the Phefumula Emoyeni One WEF.

8.11.1 MANAGING IMPACT ON FAUNA

SNAKE FIND AND HANDLING:

During construction, especially clearing of vegetation, it is likely that snakes will be encountered onsite. The following steps need to be undertaken in the event of a snake onsite:

- All work in that area is to cease;
- The site foreman/ site supervisor is to be notified;
- Snake handling will be undertaken by suitably trained and certified onsite personnel. The site supervisor or foreman needs to contact the relevant onsite personnel, who will safely remove and release the snake at a suitable habitat.

The following measures need to be communicated to all staff to ensure both human and snake safety:

- Under no circumstances may any site staff handle snakes without the proper snake handling training.
- All staff are to be provided with the PPE (e.g. snake gaiters and safety boots) to limit the potential for snake bites.
- Signage identifying the service provider appointed for snake handling must be erected around site. It is recommended that an individual onsite undergoes snake handling training to ensure that if an emergency arises it can be dealt with immediately.
- Intentional harming of snakes is prohibited onsite.

MAMMALS AND REPTILES

During the construction phase of the project the following mitigation measures need to be implemented and adhered to at all times to ensure that the impact to fauna is managed and mitigated where possible.

WALK DOWN PRIOR TO CONSTRUCTION

Prior to the start of any construction or associated activities in areas of potential biodiversity concern, the Contractors will carry out a walk-though over the area accompanied by the ESCO. The objective is to identify any sensitive habitats including potential for species of conservation interest (i.e. to consider the presence of any rare species of fauna but establish possible risk of snake bites; inspect tree cavities for bats, etc.) that may be directly or indirectly affected by the proposed works.

Any important and significant habitats must be suitably demarcated and made a no-go area.

LIMIT THE DEVELOPMENT FOOTPRINT

- The development area must be clearly defined and marked off accordingly. All No- Go areas must be demarcated and warning signs prohibiting access erected.
- Areas to be cleared must be clearly marked in the field to eliminate unnecessary clearing/ disturbance.

LIMIT DISTURBANCE

- The extent of clearing and disturbance to the native vegetation must be kept to a minimum so that the impact on fauna and their habitats is restricted.
- Where roads pass right next to major water bodies provisions must be made for the fauna such as toads to pass under the roads by using culverts or something similar.
- Vehicles to adhere to speed limits at all times.
- The intentional harming and killing of animals will be prohibited through on-site supervision and worksite rules.
- Any litter onsite needs to be cleaned up immediately to prevent it being blown into the environment surrounding the development site.

INSPECTIONS AND MONITORING

- The following inspections and monitoring need to be undertaken during the construction phase:
- Observation of vegetation clearing activities by the ESCO.
- Recording faunal fatalities to monitor success of relocation efforts.
- Regular monitoring of construction activities by the designated onsite personnel and the ESCO.
- The ESHS team will collate details and investigate all Project-related wildlife complaints and incidents including instances of unauthorised hunting, poaching, bush trade, disturbance of breeding sites and injuries / fatalities. Corrective actions will be instigated where needed to avoid recurrence.

TRAINING

The contents of the Fauna Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks. All training must be undertaken as outlined in the relevant Training Procedures.

Examples of Toolbox Talks include:

- Snakes bites
- Snake handling
- No-Go areas
- Encountering fauna onsite
- Poaching

8.12 AVIFAUNAL MANAGEMENT PLAN

The purpose of this avifaunal management plan is to provide mitigation and management measures onsite that to minimise the impacts on the priority bird species that potentially occur onsite. A number of the priority species are associated with the aquatic features on the site.

8.12.1 DESIGN MANAGEMENT PROCEDURES

- Ensure that key areas of conservation importance and sensitivity are avoided (as determined by the avifaunal specialist assessment).
- Where possible, installing transmission cables underground (subject to habitat sensitivities and in accordance with existing best practice guidelines for underground cable installation).
- Marking overhead cables using deflectors and where possible avoiding use over areas of high bird concentrations, especially for species vulnerable to collision

8.12.2 CONSTRUCTION MANAGEMENT PROCEDURE

The following mitigation and management measures must be implemented for the displacement of priority species due to disturbance during the construction phase:

- A site- specific construction management Plan (CEMP) must be implemented, which gives appropriate detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMP and must apply good environmental practice during construction. This must be done by an Avifaunal Specialist.
- Providing adequate briefing for site personnel and, in particularly sensitive locations. Personnel must be adequately briefed on the need to restrict habitat destruction and must be restricted to the actual building sites.
- Habitat destruction must be limited to what is absolutely necessary for the construction of the infrastructure, including the construction of new roads.
- During the construction phase, an avifaunal specialist must conduct surveys/exploration of the site. The aim will be to locate nest sites, so that these may continue to be monitored during the construction and operation phase.
- Measures to control noise and dust must be applied according to current best practice in the industry.
- Maximum use must be made of existing access roads and the construction of new roads must be kept to a minimum.
- Implementing an agreed post-development monitoring programme.
- Timing construction to avoid sensitive periods.

8.12.3 POST-CONSTRUCTION MONITORING

The avifaunal post-construction monitoring at the proposed Phefumula Emoyeni One WEF must be conducted in accordance with the latest version of the Best practice guidelines for avian monitoring

and impact mitigation at proposed wind energy Project Sites in southern Africa (Jenkins et al. 2011)1.

8.12.3.1 Aim Of Post-Construction Monitoring

The avifaunal post construction monitoring aims to assess the impact of the wind farm by comparing pre- and post- construction monitoring data and to measure the extent of bird fatalities caused by the wind farm. Post-construction monitoring is therefore necessary to:

- Confirm as far as possible what the actual impacts of the wind farm are on avifauna; and
- Determine what mitigation is required if necessary (adaptive management).

The proposed post-construction monitoring can be divided into three categories:

- Habitat classification
- Quantifying bird numbers and movements (replicating baseline pre-construction monitoring)
- Quantifying bird mortalities.

Post-construction monitoring will aim to answer the following questions:

- How has the habitat available to birds in and around the wind farm changed?
- How has the number of birds and species composition changed?
- How have the movements of priority species changed?
- How has the wind farm affected priority species' breeding success?
- How many birds collide with the turbines? And are there any patterns to this?
- What mitigation is necessary to reduce the impacts on avifauna?

8.12.3.2 Timing

Post-construction monitoring should commence as soon as possible after the first turbines become operational to ensure that the immediate effects of the facility on resident and passing birds are recorded, before they have time to adjust or habituate to the development. However, it should be borne in mind that it is also important to obtain an understanding of the impacts of the facility as they would be over the lifespan of the facility. Over time the habitat within the wind farm may change, birds may become habituated to, or learn to avoid the facility. It is therefore necessary to monitor over a longer period than just an initial one year.

8.12.3.3 Duration

Monitoring should take place annually for the lifetime of the facility. After the first year of monitoring, the programme should be reviewed to incorporate significant findings that have emerged. This may entail the revision of the number of turbines to be searched, and the size of the search plots, depending on the outcome of the first year of monitoring. If significant impacts are observed and mitigation is required, the matter should be taken up with the operator to discuss potential mitigation. In such instances the scope of monitoring could be reduced to focus only on the impacts of concern.

[1] Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Anderson, M.D., & A.H. Smit. 2011. Best practice guidelines for avian monitoring and impact mitigation at proposed wind energy development sites in southern Africa. Produced by the Wildlife & Energy Programme of the Endangered Wildlife Trust & BirdLife South Africa.

8.12.3.4 Habitat Classification

Any observed changes in bird numbers and movements at a wind farm may be linked to changes in the available habitat. The avian habitats available must be mapped at least once a year (at the same time every year), using the same methods which were used during pre-construction.

8.12.3.5 Bird Numbers And Movements

To determine if there are any impacts relating to displacement and/or disturbance, all methods used to estimate bird numbers and movements during baseline monitoring must be applied as far as is practically possible in the same way to post-construction work to ensure maximum comparability of these two data sets. This includes sample counts of small terrestrial species, counts of large terrestrial species and raptors, focal site surveys and vantage point surveys according to the current best practice.

8.12.3.6 Collisions

The collision monitoring must have three components:

- Experimental assessment of search efficiency and scavenging rates of bird carcasses on the site;
- Regular searches in the immediate vicinity of the wind farm turbines for collision casualties;
- Estimation of collision rates.

8.12.3.7 Searcher Efficiency And Scavenger Removal

The value of surveying the area for collision victims is only valid if some measure of the accuracy of the survey method is developed. The probability of a carcass being detected and the rate of removal/decay of the carcass must be accounted for when estimating collision rates and when designing the monitoring protocol. This must be done in the form of searcher and scavenger trails twice a year.

8.12.3.8 Collision Victim Surveys

Aligning search protocols

The search protocol must be agreed upon between the bat and bird specialists to constitute an acceptable compromise between the current best practice guidelines for bird and bat monitoring.

Searches must begin as early in the mornings as possible to reduce carcass removal by scavengers. A carcass searcher must walk in straight line transects, 6 m apart, covering 3 m on each side. A team of searchers and one supervisor must be trained to implement the carcass searches. The searchers must have a vehicle available for transport per site. The supervisor must assist with the collation of the data at each site and provide the data to the specialist in electronic format on a weekly basis. The specialists must ensure that the supervisor is completely familiar with all the procedures concerning the management of the data. The following must be sent to the specialist on a weekly basis:

- Carcass fatality data (hardcopy and scans as well as data entered into Excel spreadsheets);
- Pictures of any carcasses, properly labelled;
- GPS tracks of the search plots walked; and
- Turbine search interval spreadsheets.

When a carcass is found, it must be bagged, labelled, and kept refrigerated for species confirmation when the specialist visits the site.

Estimation of collision rates

Observed mortality rates need to be adjusted to account for searcher efficiency and scavenger removal. There have been many different formulas proposed to estimate mortality rates. The available methodologies must be investigated, and an appropriate method will be applied. The current method which is used widely is the GenEst method.

8.12.3.9 Deliverables

Annual report

An operational monitoring report must be completed at the end of each year of operational monitoring. As a minimum, the report must attempt to answer the following questions:

- How has the habitat available to birds in and around the wind farm changed?
- How has the number birds and species composition changed?
- How have the movements of priority species changed?
- How has the wind farm affected priority species' breeding success?
- What are the likely drivers of any changes observed?
- How many, and which species of birds collided with the turbines and
- Associated infrastructure? And are there any patterns to this?
- What is the significance of any impact observed?
- What mitigation measures are required to reduce the impacts?

Quarterly reports

Concise quarterly reports must be provided with basic statistics and any issues that need to be red flagged.

8.12.4 CARCASS MANAGEMENT

A dedicated team must be appointed, equipped to perform daily livestock carcass searches and promptly remove and suitably dispose (e.g. bury) any animal carcasses. Carcasses must not be disposed of near the WEF boundaries, as this creates unintentional feeding sites, increasing the risk of vulture collisions.

8.12.5 SHUT DOWN ON DEMAND

A shut-down on demand protocol has been developed and is included in **Appendix G**.

8.12.6 SECRETARYBIRDS

A Secretarybird Mitigation Strategy has been developed and is included in **Appendix H**.

8.13 SOIL MANAGEMENT PLAN

Some of the most significant impacts on soil properties occur as a result of activities associated with construction. Construction activity can have adverse impacts on soil in a number of ways by:

- Covering soil with impermeable materials, effectively sealing it and resulting in significant detrimental impacts on soils' physical, chemical and biological properties, including drainage characteristics.
- Contaminating soil as a result of accidental spillage or the use of chemicals.
- Over-compacting soil through the use of heavy machinery or the storage of construction materials.
- Reducing soil quality, for example by mixing topsoil with subsoil.

- Wasting soil by mixing it with construction waste or contaminated materials, which then have to be treated before reuse or even disposed of at landfill as a last resort.

Careful management of topsoil and subsoil is an important aspect of sustainable use of materials that are being stripped. Without a proper Soil Resource Plan there is the risk of losing, damaging or contaminating valuable soil resources. The purpose of this Soil Management Plan is to outline principles for soil management to ensure the integrity of the resource during and post-construction. This plan must be read together with the Emergency Response Plan in order to minimise the risk of contamination of soils.

8.13.1 PRINCIPLES FOR SOIL MANAGEMENT

THE CORRECT HANDLING OF TOPSOIL

- Before beginning work on site, topsoil must be stripped from all areas that will be disturbed by construction activities. Appropriate equipment must be used and appropriate work practices must be implemented for soil stripping as mishandling soil can have an adverse effect on its properties.
- Topsoil must be stripped in the driest condition possible.
- Topsoil must be retained on site in order to be used in site rehabilitation. The correct handling of the topsoil layer is in most cases the key to rehabilitation success.
- It is important that the correct depth of topsoil is excavated in order to ensure good plant growth. If excavation is too shallow, then an important growth medium for new seedlings could be lost. If excavation is too deep, this could lead to the dilution of the seed and nutrient rich topsoil with deeper sterile soil.
- Topsoil and subsoil layers must never be mixed. The mixture of topsoil with the deeper sterile soil hinders the germination of seeds which are buried too deep in the soil layer. Mixture of soil layers also leads to the dilution of nutrient levels which are at highest concentration within the topsoil, resulting in lower levels of nutrients available for new seedlings.
- To enable soil to be reused on site at a later stage, it needs to be stored in temporary stockpiles to minimise any damage or loss of function. Stockpiles must not be higher than 2m. Alternatively, topsoil berms can be created on the site boundaries. There are a number of important considerations when creating stockpiles - including soil erosion, pollution to watercourses and the risk of flooding. These will be affected by the size, height and method of forming stockpiles, and how they are protected and maintained.
- Topsoil must be stored separately from other soil in heaps until construction in an area is complete.
- The duration of topsoil storage must be minimised as far as possible. Storing topsoil for long periods leads to seed bank depletion following germination during storage, and anoxic conditions develop inside large stockpile heaps.
- All stockpiles must be positioned away from drainage lines.
- Sediment fencing must be erected downslope of all stockpiles to intercept any sediment and upslope runoff must be diverted away from stockpiles.

STRIPPING OF SUBSOIL

- The following protocols must be followed when stripping subsoil:
- On many sites subsoil will not need to be stripped but merely protected from damage. However, on other sites it might need to be temporarily removed. Where subsoil is required to be stripped, this must be undertaken before commencement of construction from all areas that are to be disturbed by construction activities or driven over by vehicles.

- Subsoil stripping depths depend on the correct identification of the sub-soil types on an ad-hoc basis, where no formal survey data exists.
- Subsoil must be stripped in the driest condition possible.
- To enable soil to be reused on site at a later stage, it needs to be stored in temporary stockpiles to minimise any damage or loss of function. There are a number of important considerations when creating stockpiles - including soil erosion, pollution to watercourses and the risk of flooding. These will be affected by the size, height and method of forming stockpiles, and how they are protected and maintained.
- All stockpiles must be positioned away from drainage lines.
- Sediment fencing must be erected downslope of all stockpiles to intercept any sediment and upslope runoff must be diverted away from stockpiles.

8.14 HERITAGE MANAGEMENT PLAN

The purpose of this document is to provide a response guideline should archaeological sites, palaeontological sites or graves become exposed during ground altering activities within the Phefumula Emoyeni One WEF area. Heritage resources are protected in terms of the National Heritage Resources Act, Act 25 of 1999 (NHRA).

A Grave Management Plan has been compiled and is included as **Appendix F**.

8.14.1 CHANCE FIND PROCEDURE

- The following procedure is only required if fossils are seen on the surface and when drilling/excavations commence.
- When excavations begin the rocks and discard must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (trace fossils, plants, insects, bone or coal) should be put aside in a suitably protected place. This way the project activities will not be interrupted.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the environmental officer then a qualified palaeontologist should be sub-contracted to conduct a site visit to inspect the selected material and check the dumps where feasible.
- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered then no site inspections by the palaeontologist will be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.

8.14.2 TRAINING, INSPECTION AND MONITORING

Since it is not practical to have a regular monitoring presence over the construction period by either an archaeologist or palaeontologist, environmental awareness training must be conducted by the EO for all contractors and subcontractors. The training must include, as a minimum, the following:

- Identifying potential features of heritage significance;
- Procedures for dealing with heritage resources discovered on site;
- Applicable Legislation pertaining to the protection of heritage resources; and

- The importance of protecting heritage resources.
- The contents of the Heritage Management Plan must be communicated to the staff through the induction training. On the job training can also be undertaken through the use of Environmental Toolbox Talks.

8.15 GRIEVANCE MECHANISM

8.15.1 GRIEVANCE MECHANISM - EXTERNAL

A grievance mechanism is a tool used to address affected communities' concerns and complaints and is an important pillar of the stakeholder engagement process, since it creates opportunities for companies and communities to identify problems and discover solutions together. The Project proponent can benefit from understanding community concerns and complaints and addressing them through all stages of project development.

Where it is anticipated that a new project will involve ongoing risk and adverse impacts on surrounding communities, the project proponent is required to establish a grievance mechanism to receive and facilitate resolution of the affected communities' concerns and complaints about the proponent's environmental and social performance. The grievance mechanism should be scaled to risks and adverse impacts of the project, address concerns promptly, use an understandable and transparent process that is culturally appropriate and readily accessible to all segments of the affected communities, and do so at no cost to communities and without retribution. The mechanism should not impede access to judicial and administrative remedies.

This Grievance Mechanism has been developed to receive and facilitate grievances and provide a solution to these concerns and grievances. The aim of the grievance mechanism is to ensure that grievances or concerns raised by local landowners, staff and or communities are addressed in a manner that:

- Provides accessible avenues for all internal and external stakeholders to contact management of the facility;
- Provides a predictable, transparent, and credible process to all parties, resulting in outcomes that are seen as fair, effective, lasting and dealt with in a timely manner;
- Builds trust as an integral component of staff and broader community relations activities; and
- Enables more systematic identification of issues and trends affecting a project, facilitating corrective action and pre-emptive engagement.

The aim of this Grievance Mechanism is to address grievances in a manner that does not require a potentially costly and time-consuming legal process. This grievance mechanism also ensures alignment with local and international best practices in human resources development and stakeholder engagement.

OBJECTIVES

The objectives of the grievance mechanism include:

- To be respectful of complainant culture, values, traditions and views;
- To resolve grievances at the local level and in a timely manner;
- To identify the root causes of grievances and address systemic issues;
- To provide a process that is dialogue based, with the complainant and the Proponent cooperating in the investigation, discussion, resolution and announcement of the grievance and result;

- To ensure fair, equitable and consistent outcomes to resolve grievances;
- To enhance and continuously improve the ability of the Proponent to fairly address community concerns.

SCOPE AND RESPONSIBLE PARTIES

A grievance mechanism is primarily for the community to raise relevant concerns about the Project / Proponent's activities and is to be implemented throughout the life cycle of the Project (i.e. throughout assessment, construction, and implementation phases).

WSP will only be involved in the stakeholder engagement and grievance management process for the assessment phase. The Project proponent and the Contractor will be responsible for implementation of the grievance mechanism throughout the construction phase.

GRIEVANCE REDRESS PROCEDURE

This grievance mechanism sets out the following steps to be taken to resolve grievances.

- **Register grievance**

    1. A grievance can be submitted in a written letter, e-mail, fax, or raised verbally in person or via telephone.
    2. Grievances raised during the assessment process are to be submitted to the EAP via the details provided as per the stakeholder engagement notifications. The EAP will notify the Proponent of the grievance.
    3. Grievances raised during the implementation process are to be submitted to the Proponent / Contractor via the relevant details, which are to be made available to registered stakeholders prior to commencement of onsite activities, as well as via site notice boards.
    4. In the event that a complaint is raised verbally, the responsible person must obtain the approval of the complainant as to the documented complaint (by way of signature of the Receipt of Grievance Form). Should the complainant have literacy issues, the responsible person may request that a third party (friend / relative of complainant) is available to verify / approve the contents of the documented complaint to the satisfaction of the complainant.
    5. The submission should include the nature of the grievance, the date when it occurred and the name and contact details of the complainant.
    6. Grievances will be accepted anonymously or through a third party (e.g. unions, NGOs, local authorities, community representatives, etc.).
    7. Individuals have the right to request that their name be kept confidential throughout the grievance process.
    8. As men and women may communicate their grievances differently, and also have different types of grievances, the complainant may request that their grievance is processed by a female / male representative. In the event that such a request is made, the Proponent, as far as reasonably practicable, will accommodate this request.

- **Within a Week (7 days) of receiving the grievance the Proponent will:**

    1. Enter the grievance into the Proponent's records that track grievances;

2. Assess the grievance according to specific criteria and if necessary, develop an appropriate approach for the particular grievance;
3. Provide a written acknowledgement of the grievance including the name of the responsible person to contact about progress, an explanation of the steps that will be taken to investigate, discuss and resolve the grievance, and an anticipated timetable for processing the grievance.

- **Processing the Grievance:**

The responsible person will:

1. Identify the parties involved;
2. Clarify issues and concerns raised by the grievance through direct dialogue;
3. Classify the grievance in terms of seriousness according to the gravity of the allegation, the potential impact on an individual's or a group's welfare and safety, or the public profile of the issue;
4. Convene a staff group with expertise relative to the grievance;
5. Determine the method for resolving the grievance – the most common approaches, not excluding others, will be:
   - The Proponent proposes a solution;
   - The Proponent and aggrieved party decide together the solution;
   - The Proponent and aggrieved party defer to a third party for mediation / arbitration.
6. Gather views of other stakeholders, including those of the Proponent and if necessary, an agreed neutral technical opinion;
7. Determine initial options that parties have considered and explore various approaches for settlement;
8. Conduct the process as agreed;
9. Close the grievances by signing the Complaint Close-Out Form (i.e. that the grievance has been resolved satisfactory to both parties).
10. The Proponent may "close" the grievance even if the complainant is not satisfied with the outcome. This option can be pursued by the Proponent in the case that the complainant is unable to substantiate a grievance, or if there is an obvious speculative or fraudulent attempt. In such situations, the Proponent's efforts to investigate the grievance and to arrive at a conclusion will be well documented and the complainant advised of the situation. The Proponent (or contractors working for the Proponent) will not dismiss grievances based on a cursory review and close them in their grievance record unless the complainant has been notified and had the opportunity to provide supplementary information / evidence;
11. Keep a record that tracks the progress and communications for each grievance.

- **Processing Timeline**

1. The Proponent will aim to bring the grievance to a resolution within 30 days of receiving the grievance. The grievance shall be acknowledged within 7 days by the responsible person, and responded to within 30 days. If the matter takes longer than 30 days to resolve, the complainant

will be informed through dialogue and in writing, of the reason for the delay, any advances or difficulties encountered and the anticipated new resolution date.

While the general principles for grievance redress during construction are as above, a project-specific external stakeholder grievance mechanism shall be implemented.

RECOURSE

If the complainant is not satisfied with the outcome of the grievance process the aggrieved party has the right to address the grievance via the judicial system.

MANAGING, TRACKING, RECORDING GRIEVANCES – INTERNALLY

In terms of managing grievances the Proponent will:

- Appoint a senior manager to oversee the Grievance Mechanism. Another member of staff will be appointed to carry out the day-to-day work in this area and involve specialist staff and external parties, where required, who may need to be consulted to resolve a grievance.
- Maintain a register of grievances. All activities, including registration of the grievance and the progress through to outcome will be recorded.
- Ensure that grievances and resolutions are communicated internally to all staff through monthly reports.
- Launch the Grievance Mechanism and regularly remind communities that it is available to use.

Contractors are expected to follow this Grievance Procedure. Contractor shall be proactive and available to participate in the grievance resolution processes. Contractor participation is intended to allow for specific contractor grievances to be addressed efficiently.

Contractors shall ensure that all individual contractor employees are aware of the Grievance Procedure.

Contractors will receive any grievance from an individual or community and notify the Proponent thereof immediately.

Contractors shall not make any direct agreements or resolution with local communities without prior coordination of such actions with the Proponent.

The Contractor's community relations team (or equivalent) will attend all coordination meetings requested by the Proponent, as required. The contractor community relations management (or equivalent) will report to the Proponent's management team on a regular basis – in regard to social incidents and community relations issues. The Proponent, or their representative, will conduct regular audits on contractors to ascertain compliance with this Grievance Procedure.

8.15.2 GRIEVANCE MECHANISM - INTERNAL

The Proponent will establish a Grievance Mechanism that will set out the process for workers to communicate their grievances. The grievance mechanism will be available to workers of the Proponent, Contractors and subcontractors.

A Code of Conduct will set out practice measures that the construction workers will have to adhere to, to ensure a positive relationship is built and maintained with the landowners and local communities.

8.16 HIV/AIDS MANAGEMENT PLAN

Should the project be developed, an HIV/AIDS plan will be developed, however for input into this EMPr, a generic and high-level management plan has been compiled.

8.16.1 OBJECTIVES OF THIS PLAN

The overall objectives of the HIV/AIDS management plan are:

- Create awareness around HIV/AIDS amongst onsite personnel;
- Mitigate and manage the spread of HIV/AIDS onsite; and
- Provide support for staff who have HIV/AIDS

8.16.2 GUIDING PRINCIPLES

1. Non- discrimination: The respect of human rights and dignity of persons infected or affected by HIV/ AIDS requires equality between individuals living with HIV/AIDS and those without. No employee will be discriminated against on the basis of his or her real or perceived HIV positive status. This includes access to training and promotion.
2. Job Security: Employees with HIV infection or AIDS will not be dismissed on the grounds of their status. Persons with AIDS-related illnesses should be able to work for as long as medically fit in available, appropriate work (reasonable accommodation).
3. Confidentiality: All persons with HIV or AIDS have the legal right to privacy. No employee or applicant for a job shall be required to disclose HIV-related personal information. Nor should co-workers be obliged to reveal such information about fellow workers. Company management and medical staff as well as union leaders and officials are bound by strict confidentiality about a person's status.
4. Voluntary Counselling and Testing (VCT): No HIV/AIDS testing will be required for job applicants or for persons already in employment. Individuals are encouraged to know their HIV status through testing. Testing must be voluntary, confidential and with the informed and written consent of the person concerned. Professional pre- and post-testing counselling services must be available.
5. Treatment and Care : Workers infected with HIV and suffering from AIDS and their dependents are entitled to the same health services as those with other diseases. Treatment with antiretroviral drugs must be available when VCT is advocated. Dependents of workers who have died from AIDS or AIDS-related diseases must have access to the same care as those who have died from other diseases or industrial accidents.
6. Gender Equality : The gender dimensions of the epidemic are recognised by the social partners. Gender discrimination at the workplace is ruled out. Sexual harassment and the exploitation of dependency of women is an offence.
7. Occupational Health and Safety : The work environment must be healthy and safe. Tools which bear the danger of injuries such as cuts should not be shared between workers. In case of accidents which involve blood and body fluid emissions, first aid must be exercised with the use of protective barriers, such as gloves and masks, which prevent direct contact with blood or other body fluids.
8. Prevention and Behaviour Change : Employees with HIV and AIDS shall not be unfairly discriminated against in the allocation of employee benefits. With regard to sick leave, HIV and AIDS related illness will be treated no different from other chronic or life threatening conditions.

Health and social security schemes run by the company shall give the same benefits to those with HIV and AIDS as to any other worker. The same applies to separation allowance, retirement schemes and pension benefits.

9. Prevention and Behaviour Change : HIV infection is preventable. The parties will promote prevention efforts at the workplace, within families and in the wider community. Because it is within the power of each individual to avoid HIV infection, it is expected that employees take responsibility of their own health. They are urged to avoid risky behaviour such as unprotected sexual intercourse and the injection of drugs through shared needles.

8.16.3 IMPLEMENTAION

The plan will be implemented onsite through the following:

1. This HIV/AIDS management plan shall be made known and explained to all employees through the distribution of the text as a brochure in the appropriate languages and through meetings.
2. The implementation of this plan includes information and education activities aimed at communicating correct information about HIV/AIDS and eradicating myths in order to eliminate stigma and discrimination.
3. Phefumula Emoyeni One will organise and if necessary and appropriate with the participation of health professionals, regular awareness and prevention programmes about HIV/AIDS during working time.
4. As condoms and femidoms are an effective barrier to sexually transmitted infections and HIV transmission, condoms and femidoms will be made available at no cost on the construction site.
5. Meetings, information and training activities should be included in an action programme with an implementation plan for a defined period of time. This should include material to be acquired or produced. The company should make provisions in its budgetary process to include the cost of activities and materials.
6. Disputes or grievances arising from the application of the principles of this policy and its implementation are dealt with by the HIV/AIDS Committee and/or in established dispute resolution or grievance procedures.

8.17 SECURITY POLICY

A generic high-level security policy has been compiled for the drafting of this EMPr. Should the project be developed further, a site-specific policy will be produced.

This procedure shall be applicable to all staff working within the project area to comply with the relevant regulations and international standards.

Phefumula Emoyeni One overarching objective is to protect the people and assets in a way that minimises conflict and respects the human rights of its diverse stakeholders, avoids creating or worsening conflict and address security threats in as peaceful a way as possible. Phefumula Emoyeni One have adapted the IFC Performance Standards and supporting World Bank Group Environmental, Health and Safety Guidelines as the overarching standards associated with human rights, labour force management, vulnerable groups and stakeholder engagement to guide it towards achievement of appropriately high levels of environmental and social performance throughout the Project's life cycle.

A security company must be employed to guard the site and monitor access and must be registered with the Private Security Industry Regulatory Authority (PSIRA). The company should be utilised for the project life-cycle, alternatively different companies can be used for the construction, operations and decommissioning phases. The choice is at the discretion of the Holder of the EA.

The following guiding principles have been developed for site security:

- All access roads shall be gated to restrict access to the general public. Gates will be required to be kept locked when construction is occurring or when turbine maintenance is not occurring.
- The Contractor, prior to arriving on site, will assess any risks posed by its security arrangements to people within and outside the Project site.
- No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel).
- The Operations and Maintenance Building ("O&M building") shall be locked at all times when Project personnel are not inside.
- The security arrangements must take account of the principles of proportionality and good international practice in relation to hiring, rules of conduct, training, equipping, and monitoring of security;
- The contractor and Holder of the EA:
  - is required to make reasonable inquiries to ensure that those providing security are not implicated in past abuses; and
  - Ensure that the security company is adequately trained in the use of force and appropriate conduct, and they act within the applicable law.
- A grievance mechanism for affected communities shall be provided to express any concerns about security arrangements.

Phefumula Emoyeni One have adapted the United Nations Basic Principles on the use of Force and Firearms and Voluntary Principles on Security and Human Rights.

9 CONCLUSION

Phefumula Emoyeni One (Pty) Ltd is proposing the development of the 550 MW Phefumula Emoyeni One WEF, located 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province. This S&EIA process considered the biophysical location of the proposed development, as well as 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 purpose of the proposed project is to contribute to the national energy targets of diversification of energy supply and the promotion of clean energy. The project will also aid in overcoming the power shortages that are currently faced in the country. Other socio-economic benefits would result from the proposed project, including the increase of energy supply, employment opportunities and local economic development.

It is therefore the opinion of the EAP that provided this project is mitigated, as per the mitigation and management measures outlined in this EMPr, the project will result in impacts that should not negatively affect the environment. It is the applicant's responsibility to ensure that this EMPr is made binding on the contractor by including the EMPr in the contract documentation. It is understood that the applicant commits to implementing the mitigation measures outlined in the EMPr.

The contractor must thoroughly familiarise himself with the requirements of the EMPr and appoint an EO to oversee the implementation of the EMPr on a day-to-day basis. In addition, the applicant must appoint an external ECO to undertake monthly compliance audits during construction against the requirements of the EMPr as well as the EA.

Parties responsible for transgression of this EMPr must be held responsible for any corrective actions that may need to be undertaken. Parties responsible for environmental degradation through irresponsible behaviour/negligence must receive penalties.

WSP is of the opinion that the project can proceed, provided that the outlined mitigation measures of the S&EIA process and this EMPr are implemented effectively.

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

The Proponent also recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. Should the above-mentioned environmental guidelines and mitigation measures be adopted, it is anticipated that the negative environmental impacts of the proposed WEF will be mitigated adequately. The Proponent and the selected Contractor shall appoint relevant personnel, as well as an independent ECO, to monitor the site periodically throughout construction to ensure that the required environmental controls are in place and working effectively. During operation and maintenance, the area specific Environmental Manager and EO, with the support of the maintenance supervisor, will monitor environmental controls.

Appendix A

EAP CV

Public

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

CAREER SUMMARY



Ashlea is a Principal Associate with 19 years' experience in the environmental field. She currently provides technical and strategic expertise on a diverse range project in the environmental management field, including environmental scoping and impact assessment studies, environmental management plans, waste and water management, as well as the provision of environmental management solutions and mitigation measures. Ashlea has been involved in the management of a number of large EIAs specifically within the energy sector such as the Medupi Power Station, and Pebble-Bed Modular Reactor (PBMR) and numerous Renewable Energy Developments and Transmission Powerlines. She also has significant environmental auditing experience and expertise having undertaken over 70 compliance audits. Ashlea holds a Masters in Environmental Management; a BTech (Nature Conservation), and a National Diploma (Nature Conservation). She is also a Registered Environmental Assessment Practitioner.

Countries of experience gained include South Africa, Mozambique, Zimbabwe and Zambia.

9 years with WSP

19 years of experience

Area of expertise

Auditing

ESIR

Energy

Infrastructure

Mining

Training

Waste Management

Language

English – Fluent

Afrikaans - Fluent

EDUCATION

Masters in Environmental Management, University of the Free State, South Africa	2006
B Tech, Nature Conservation, Technikon SA, South Africa	2001
National Diploma in Nature Conservation, Technikon SA, South Africa	1999

ADDITIONAL TRAINING

Conduct outcomes-based assessment (NQF Level 5), South African Qualifications Authority (SAQA)	2009

PROFESSIONAL MEMBERSHIPS

Registered Environmental Assessment Practitioner (Registration Number: 2019/1005)	2020

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

PROFESSIONAL HISTORY

WSP Group Africa (Pty) Ltd	May 2013 - present
Lidwala Consulting Engineers	April 2010 – April 2013
GIBB	January 2009 – March 2010
Bohlweki Environmental	August 2004 – December 2008
Vuka Environmental	August 2003 – July 2002

PROFESSIONAL EXPERIENCE

Energy Sector

G7 Renewable Energies, Karreebosch Wind Energy Facility Project, Matjiesfontein, Western Cape.
2022-2023
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

G7 Renewable Energies, Karreebosch to Komsberg 132kV Powerline Project, Matjiesfontein, Western Cape.
2022-2023
Project Manager
Compilation of a Basic Assessment and Environmental Management Programme for the 132kV Powerline

Enertrag, Camden Renewable Energy Complex, Ermelo, Mpumalanga.
2021-2023
Project Manager
Compilation of four Environmental Impact Assessments, three Basic Assessments and associated Environmental Management Programmes for the Camden Renewable Energy Complex, including two wind energy facilities, a solar energy facility, one 400kV Gird Connection and three 132kV grid Connections.

Enertrag, Dalmanutha Renewable Energy Complex, Belfast, Mpumalanga.
2022-2023
Project Manager
Compilation of one Environmental Impact Assessment, four Basic Assessments and associated Environmental Management Programmes for the Dalmanutha Renewable Energy Complex, including two wind energy facilities and associated Grid Connections

Enertrag, Mukondeleli and Impumelelo Wind Energy Facilities, Secunda, Mpumalanga.
2022-2023
Project Manager
Compilation of two Environmental Impact Assessments, two Basic Assessments and associated Environmental Management Programmes for the Secunda Renewable Energy Complex, including two wind energy facilities and associated Grid Connections

Red Rocket South Africa Limited, Brandvalley Wind Energy Facility Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Red Rocket South Africa Limited, Bon Espirange to Komsberg 132kV Powerline Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Compilation of a Basic Assessment and Environmental Management Programme for the 132kV Powerline

Red Rocket South Africa Limited, Rietkloof Wind Energy Facility Project, Matjiesfontein, Western Cape.
2021-2022
Project Manager
Undertaking of a Part 2 Amendment Process as well as the Amendment of the Environmental Management Programme for a 140MW Wind Energy Facility

Calodex (Pty) Ltd., 100MW Solar Photovoltatic (PV) Plant, Springs in Gauteng, South Africa
2021
Project Director
This project involved the compilation of a Basic Assessment and Environmental Management Plan for a 100MW Solar PV Plant.

Eskom Holdings SOC Limited, Erica 400kV Loop-in-Loop-out (LILO) Powerline, Cape Town, Western Cape, South Africa.
2020
Compilation of an environmental screening assessment for the Erica 400kV LILO Powerline.

BioTherm Energy, Maralla East and West Wind Energy Facilities, Sutherland in the Northern and Western Cape, South Africa.
2019
Project Manager
Compilation of two Part 2 Amendment Process for the changes in technical scope of the Wind Energy Facilities.

Eskom Holdings SOC Limited, Ruigtevallei 132kV Powerline, Gariep in the Free State, South Africa
2019
Project Manager
Compilation of a Part 2 Amendment Process for the deviation of the Ruigtevallei – Dreunberg 132 kV powerline.

Globeleq, Nakonde and Mpika Wind Energy Projects, Zambia
2018
Project Manager
Compilation of two Environmental Project Briefs for the establishment of meteorological masts.

G7 Renewable Energies, Rietkloof Wind Energy Facility Project, Matjiesfontein, Western Cape.
2018
Project Director
Compilation of a Basic Assessment and Environmental Management Programme for a 140MW Wind Energy Facility.

Southern African Power Pool (SAPP), Mozambique – Zambia Interconnector Powerline, Mozambique
2018
Project Manager
This project involved the compilation of the Environmental and Social Impact Assessment and Environmental and Social Management Plan for a 300km 400kV powerline between Tete, in Mozambique, and Chipata, in Zambia.

Eskom Holdings SOC Limited, Ankerlig – Koeberg 132kV powerline walkdown, South Africa
2017

Project Manager
This project involved the compilation of a Construction and Operation Environmental Management Plans for the Ankerlig – Koeberg 132kV powerline.

WSP | Parsons Brinckerhoff, Gwanda 100MW Solar Project, Gwanda, Matebeleland South Province, Zimbabwe
2018
Project Manager
This project involved the high-level review of the Environmental Impact Assessment for a 100MW Photovoltaic (PV) Solar Project against relevant legislation and international standards.

WSP | Parsons Brinckerhoff, Southern Energy Coal Fired Power Station, Hwange, Zimbabwe
2016
Project Manager
This project involved the high-level review of the Environmental Impact Assessment for the Southern Energy Coal Fired Power Station against relevant legislation and standards.

BioTherm Energy (Pty) Ltd, Proposed Solar and Wind Projects, Aggenys and Sutherland Northern and Western Cape Provinces, South Africa
2015
Project Manager
This project involved the compilation of 15 Environmental Impact Assessments and Environmental Management Plans for 2 Solar and 2 Wind energy Projects.

Central Energy Fund (CEF), Proposed Solar Park, Northern Cape Province, South Africa
2012
Strategic Environmental Advisor
This project involved the provision of process expertise for the compilation of an Environmental Impact Assessment and Environmental Management Plan for the proposed Solar Park.

Eskom Transmission, Proposed Tabor - Nzhelele 400kV Transmission Lines and associated infrastructure, Limpopo Province, South Africa
2012
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 100km 400kV powerline between Louis Trichardt and Musina in the Limpopo Province.

Eskom Holdings SOC Limited, Retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at Units 2, 3 and 4 at the Grootvlei Power Station, South Africa
2012
Project Manager
This project involved the compilation of a Basic Assessment Report and Environmental Management Plan for the proposed retrofitting of the existing Electrostatic Precipitators with Fabric Filter Plants at the Grootvlei Power Station.

Parsons Brinkerhoff Africa and Mulilo Power, Proposed Mulilo Coal Fired Power Station and associated infrastructure as well as associated power lines and substations, Musina, Limpopo, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Pebble Bed Modular Reactor Demonstration Plant and Associated Infrastructure, Western Cape, South Africa

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Transmissions, Proposed Bantamsklip – Kappa 765 kV Transmission Lines and associated infrastructure, Karoo, Western and Northern Cape, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for four 260km 765kV powerlines between the Bantamsklip Nuclear Power Station Site and the proposed new Kappa Substation.

Eskom Transmission Proposed Bantamsklip – Bacchus, Bacchus - Kappa and Bacchus – Muldersvlei 400 kV Transmission Lines and associated infrastructure, Western and Northern Cape, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Distribution – Central region.Westgate – Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom, Environmental Scoping Study for the proposed new distribution line and substation, Dundonald, Mpumalanga, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan for a 132kV powerline as well as a new substation in the Tarlton area of Gauteng. Also involved in the Public Participation Process.

Eskom Distribution, The proposed new 132 kV sub-transmission line between the Dinaledi and GaRankuwa substations for Eskom, GaRankuwa, Northwest, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom, Transmission Expansion of the Transmission powerline network and associated infrastructure between the Perseus substation and the Beta substation, Free State, South Africa
2008
Project Manager
This project involved the compilation of an alignment specific construction Environmental Management Plan for the 13km 765kV Perseus Beta Turn-ins.

Eskom Distribution – Central Region, Tarlton – Kromdraai 132 kV Sub-Transmission line and associated infrastructure, Gauteng, South Africa
2008
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Eskom Distribution – Central Regio, Basic Assessment for the proposed Watershed – Mmabatho 88kV Power line. Northwest, South Africa
2008
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Eskom Distribution – Central Region, Proposed Watershed – Mmabatho 88kV Power line. Northwest, South Africa
2007
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Combined Cycle Gas Turbine Plant and Associated Infrastructure near Majuba, Mpumalanga, South Africa
2007
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed Capacity Increase of the Atlantis OCGT Plant and Associated Infrastructure, Western Cape, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Concentrated Solar Thermal Plant in the Northern Cape, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Holdings SOC Limited, Proposed Underground Coal Gasification plant, Eskom, Mpumalanga, South Africa
2006
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed new Coal-fired Power Station in the Lephalale Area for Eskom, Limpopo, South Africa
2005
Project Manager
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Eskom Generation, Proposed Open Cycle. Gas Turbine Power Station at Atlantis for Eskom, Western Cape, South Africa
2005
Environmental Consultant
This project involved the compilation of an Environmental Impact Assessment and Environmental Management Plan.

Infrastructure Sector

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Sasol South Africa Limited, Boegoebaai Green Hydrogen Project, Northern Cape, South Africa
2022-2023
Project Manager
This project involved the compilation of an High level Environmental Screening for the Project, in preparation future Environmental Impact Assessment Processes

Enertrag, Hendrina Green Hydrogen and Ammonia Facility, Mpumalanga, South Africa
2022-2023
Project Director
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme

Enertrag, Camden Green Hydrogen and Ammonia Facility, Mpumalanga, South Africa
2021-2023
Project Director
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme

Anglo American, Emalahleni Water Treatment Plant Amendment Project (EWRP), Emalahleni, Mpumalanga, South Africa.
2020
Project Manager
Compilation of a Part 1 Amendment Process for the changes to the EWRP Environmental Authorisation as well as an update of the Environmental Management Programme.

Eskom Holdings SOC Limited, Hendrina Leachate Dam, South Africa
2018
Project Manager
This project involves the compilation of a Basic Assessment and Environmental Management Plan for a leachate Dam at the Domestic Waste Landfill Site at the Hendrina Power Station.

S**ANRAL, Rehabilitation of the R34 between Vryburg and Schweizer-Reneke, Vryburg and Schweizer-Reneke, Northwest, South Africa**
2016
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Envirocin Incineration Systems CC, Proposed Expansion of the Cremation Facilities at the Envirocin Pet Crematorium, Kyasands, Gauteng, South Africa
2013
Project Manager
This project involves the compilation of a basic assessment for the expansion of the cremation facilities.

Industrial Development Corporation of SA (Pty) Ltd, Proposed Kraft Paper Mill in Frankfort, Frankfort, Free State, South Africa
2013
Project Manager
This project involved the undertaking of an Environmental Impact Assessment, including the compilation of an Environmental Management Programme.

SANRAL, Rehabilitation of the N14 between Delerayville and Sannieshof, Northwest, South Africa
2011
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan as well as the construction of a new bridge over the Hartsriver. This project also included the compilation of Water Use License and Mining Permit Applications.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Makhado Municipality, Proposed new Waterfall Cemetery, Limpopo, South Africa
2011
Project Manager
This project involved the compilation of a Basic Assessment and Environmental Management Plan.

Johannesburg Roads Agency, Route determination of the proposed Metro Boulevard, Weltevreden Park Area, Gauteng, South Africa
2008
Project Manager
This project involved the undertaking of an Environmental Impact Assessment.

Eskom Generation, Proposed new fuel supply pipeline between Milnerton and Atlantis, Western Cape, South Africa
2007
Project Manager
This project involved undertaking an Environmental Impact Assessment for the proposed new fuel supply pipeline between Milnerton and Atlantis to supply the Ankerlig Power Station.

Mining Sector

Rietvlei Mining Company, Establishment of the Proposed Rietvlei Opencast Coal Mine, Middelburg, Mpumalanga, South Africa
2013
Project Manager
This project involves the undertaking of an integrated environmental authorisation process, including an Environmental Impact Assessment, Environmental Management Programme Report, Waste Management License Application and Water Use License Application.

AngloGold Ashanti, Decommissioning of Redundant Infrastructure at the Vaal River Operations, Northwest and Free State, South Africa
2013
Project Manager
This project involves undertaking an integrated Environmental Authorisation and Waste Management License process for the proposed decommissioning of redundant infrastructure.

AngloGold Ashanti (Pty) Ltd, Decommissioning of Redundant Infrastructure at the West Wits Operations, Gauteng, South Africa
2013
Project Manager
This project involves undertaking a Basic Assessment process for the proposed decommissioning of redundant infrastructure.

Exxaro Coal (Pty) Ltd Inyanda Mine Pegasus South Expansion, Middelburg, Mpumalanga, South Africa
2011
Project Manager
This project included the compilation of an Environmental Impact Assessment, Environmental Management Plan, the Amendment of the existing Environmental Management Programme Report and the amendment of the existing Water Use License.

Sishen Iron Ore (Pty) Ltd, Sishen Infrastructure Program, Northern Cape, South Africa
2010
Project Manager
This project involved the compilation of an Environmental Impact Assessment and an Environmental Management Plan for the infrastructure expansion programme.

Sound Mining Solutions, Prospecting Permit Applications in the Kuruman area of the Northern Cape, South Africa

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

2011
Project Manager
This project involved the compilation of Environmental Management plans as part of six applications for Prospecting Permits.

Limpopo Department of Roads and Transport, Borrow pits required by the Limpopo Department of Roads and Transport, Limpopo, South Africa
2010
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits required for the rehabilitation of provincial roads.

Eskom Generation, Borrow pits required for the Medupi Coal Fired Power Station, Limpopo, South Africa
2008
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits for borrow pits.

Eskom Generation. Borrow pits required for the Ingula Pumped Storage Scheme, KwaZulu-Natal, South Africa
2008
Project Manager
This project involved the compilation of Environmental Management plans as part of the applications for Mining Permits.

Eskom Generation Project Manager, Mining Right Application for a 23 Hectare Borrow Pit required for the Steelpoort Pumped Storage Scheme, Mpumalanga, South Africa
2007
Project Manager
This project entailed the compilation of the required Environmental Management Programme Report in support of a Mining Right Application.

Minexpo, Renewed Mining and Prospecting Activities on the farm Quaggaskop 215, Vanrhynsdorp, Western Cape, South Africa
2004
Environmental Consultant
This project involved the compilation of an Environmental Management Programme Report for the recommencement of mining and prospecting activities.

Waste Management

Sasol Secunda Operations, Sasol Waste Management Environmental Management Programme, Secunda, South Africa
2019
Project Manager
Compilation of an operational Environmental Management Programme for the Sasol Waste Ash Facility, Charlie 1 Disposal Facility and the Waste Recycling Facility.

Eskom Holdings SOC Limited, Proposed continuous Ashing at Majuba Power Station, Mpumalanga, South Africa
2012
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Majuba Power Station in Mpumalanga.

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Eskom Holdings SOC Limited, Proposed continuous Ashing at Tutuka Power Station, Mpumalanga, South Africa
2012
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed continuous ashing project at the Tutuka Power Station in Mpumalanga.

Hendrina Power Station, Proposed extension of Ash Dams at Hendrina Power Station, Mpumalanga, South Africa
2011
Project Manager
This project entailed the compilation Environmental Impact Assessment and Waste Management License Application for the proposed extension of the ash dams at the Hendrina Power Station in Mpumalanga.

Coega Development Corporation, Phase 1 of the Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility, Eastern Cape
2005
Project Manager
This project entailed the compilation Environmental Impact Assessment for the Proposed Regional General and Hazardous Waste Processing Facility in the Eastern Cape.

Auditing

Sasol Chemical Industries, Secunda Synfuels Operations Waste Management License Audits for the Sasol Secunda, Mpumalanga, South Africa
2014 – 2021
Lead Auditor
These projects involve the annual and biannual environmental compliance auditing of the Waste Management licenses for various waste facilities

South 32. Compliance Audits at South 32, Mpumalanga, South Africa
2016 – 2020
Project Manager
This project involved the environmental compliance audits of the Water Use Licenses for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga.

South 32, Compliance Audits at Middelburg Water Reclamation Plant (MWRP), Mpumalanga, South Africa
2016 – 2020
Project Manager
This project involved the environmental compliance audits of the Water Use License and Waste Management License for the MWRP at South 32 in Mpumalanga.

Nedbank, BioTherm Round 4 Lenders Technical Advisor, South Africa
2018 – 2021
Project Manager – Environmental
Environmental monitoring of the construction of the Konkoonsies II and Aggeneys Photovoltaic Solar Plants against the IFC Performance Standards.

Eskom Holdings SOC Limited, Water Use Licence Audits, Delmas, Mpumalanga, South Africa
2019
Lead Auditor
External compliance audits of the water use licences for the Delmas and Argent Powerlines in Mpumalanga.

Sasol Oil (Pty) Ltd, Sasol Alrode and Pretoria West Depot Audits, Pretoria, South Africa
2016 – 2020
Lead Auditor

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

Environmental compliance audits for environmental authorisations and environmental management plans for the Sasol Alrode and Pretoria West Depots.

Sasol Oil (Pty) Ltd, Sasol Regulation 34 Audits, South Africa
2019
Lead Auditor
Environmental compliance audits for 13 authorisations for the Sasol Owned Petrol Filling Stations.

Anglo American Platinum. Regulation 34 Audits at Mogalakwena Mine, Limpopo Province, South Africa
2019
Project Manager
Environmental compliance audits of the EMPR and various environmental authorisations at the Mogalakwena Mine.

Sasol Secunda Operations, Sasol Environmental Authorisations and Environmental Management Plans for the Secunda Operations, Secunda, South Africa
2019
Lead Auditor
Environmental compliance audits for 49 authorisations for the Sasol Secunda.

Palabora Company, Waste Management Licence Compliance Audit and PCB Plan Close Out Audit, Phalaborwa, Limpopo, South Africa
2019
Project Manager
Environmental compliance audit of a WML and the PCB Plan for the Palabora Mine.

Sasol Mining, Water Use Licence Compliance, Secunda, South Africa
2018
Project Manager
Environmental compliance audit of six WULs held by mining operations.

South 32, Legal Assessment at South 32, Klipfontein and Middelburg Mine North and South Sections at South 32 in Mpumalanga, South Africa

2019
Project Manager and Lead Auditor
This project involved the assessment of legal compliance against the mine's legal register.

Investchem (Pty) Ltd, InvestChem Annual Environmental Compliance Monitoring, Kempton Park, Gauteng, South Africa
2013 – 2019
Lead Auditor
This project involved the annual environmental compliance auditing for InvestChem's Sulphonation Plant. The monitoring included InvestChem's compliance to various commitments contained in their environmental management programmes and conditions within their environmental authorisations (records of decision).

Sasol Oil (Pty) Ltd, Compliance Audits at Sasol Alrode and Pretoria West Depots, Gauteng, South Africa
2015 – 2019
Project Manager and Lead Auditor
Annual Environmental compliance auditing of the Environmental authorisations at the Alrode and Pretoria West Depots in Gauteng.

Eskom Holdings, Water Use Licence for the Letabo Power Station, Free State, South Africa
2018
Project Manager

Environmental compliance audit of the WUL held by Eskom Letabo Power Station.

Seriti Coal, Compliance Audits at Kriel Colliery, Kriel, Mpumalanga, South Africa
2018
Project Manager
This project involved the environmental compliance audits of the Water Use Licenses.

South 32, Legal Assessment at South 32, Mpumalanga, South Africa
2017
Project Manager and Lead Auditor
This project involved the assessment of legal compliance against the mine's legal register for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections.

South 32, EMPR Performance Assessment Report at South 32, Mpumalanga, South Africa
2016
Project Manager
This project involved the formal assessment and verification of the Environmental Management Programme Report for the BMK, Douglas, Klipfontein and Middelburg Mine North and South Sections.

ACWA Power, Solafrica Bokpoort CSP Power Plant (Pty) Ltd. Compliance Audit for the Bokpoort Concentrating Solar Power (CSP) Facility, Groblershoop, Northern Cape, South Africa
2016
Lead Auditor
This project involved the environmental compliance auditing of the Waste Management License, Environmental Authorisation and Water Use License.

Anglo Thermal Coal, EMPR Performance Assessment Report for the Landau Colliery, Mpumalanga, South Africa
2013
Auditor
This project involved the formal assessment and verification of the Landau Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002).

AfriSam Southern Africa (Pty) Ltd, Waste Management License Audit for the Slagment Operation, Vanderbijlpark, Gauteng, South Africa
2013
Lead Auditor
This project involved the annual environmental compliance auditing for AfriSam's Slagment Operation in Vanderbijlpark in Gauteng Province. The audit included AfriSam's compliance to the conditions of their waste management license.

Anglo American Thermal Coal, EMPR Performance Assessment Report for the New Vaal Colliery, Free State, South Africa
2006 – 2007
Auditor
This project involved the formal assessment and verification of the New Vaal Colliery Environmental Management Programme Report, conducted in accordance with Regulation 55 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002).

Environmental Control

Wood South Africa (on behalf of Sasol South Africa Limited), Clean Fuels Projects (EHN & MFO, Large Tanks) Project, Secunda
2022-2024
Project Director

Ashlea Strong

Environmental Planning & Advisory, Principal Associate

This project involved the monthly auditing of the contractor's compliance with the conditions of the environmental authorisation and environmental management plan for the Sasol Clean Fuels Projects in Secunda.

SANRAL.N14, rehabilitation between Sannieshof and Delareyville, Northwest, South Africa
2012
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer and SANRAL.

Victor Khanye Municipality. Delmas and Bontleng Wastewater Treatment Works, Mpumalanga, South Africa
2009
Environmental Control Officer
This project involved a once off compliance audit of the above-mentioned Wastewater Treatment Works.

Mkhondo Local Municipality. Nkonjaneni Water Borne Sewer Project in Piet Retief, Mpumalanga, South Africa
2009
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan as well as ad hoc environmental advise to the Project Engineer.

ERWAT, Upgrading of the Waterval Water Care Works, Gauteng, South Africa
2005 – 2007
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan.

City of Tshwane Lotus Gardens, Ext 2 Township establishment, Gauteng, South Africa
2003
Environmental Control Officer
This project involved the monthly auditing of the contractor's compliance with the conditions of the approved Environmental Management Plan.

Training

SANRAL, N14 rehabilitation between Sannieshof and Delareyville, Northwest, South Africa
2012
Project Manager
This project involved the provision of training for the staff of the N14 rehabilitation project with regards to the contents of the environmental management plan.

Mintek, Training in Environmental Aspects and Rehabilitation for the Small-Scale Mining Division of Mintek, City, Province, South Africa
2004
Trainer
This project involved the provision of environmental awareness training for delegates involved in the small-scale miner training programme run by the Mintek small scale mining division.

Transwerk, Training in Environmental Aspects and Impacts, Germiston, Gauteng, South Africa
2004
Trainer
This project involved the provision of environmental aspects and impacts training for the staff of Transwerk in Germiston.

Appendix B

EAP DECLARATION

Public

APPENDIX 6C
DECLARATION OF EAP AND UNDERTAKING UNDER OATH OR AFFIRMATION

I, Ashlea Strong., declare that –

a) I act as the independent, registered in terms of EAPASA, environmental assessment practitioner in this application;
b) I have expertise in conducting environmental impact assessments, including knowledge of the Act, EIA Regulations and any guidelines that have relevance to the proposed activity;
c) I will comply with the Act, EIA Regulations and all other applicable legislation;
d) I am aware that I must be registered with Environmental Assessment Practitioners Association of South Africa (EAPASA) in terms of Regulation 14 of Section 24H Registration Authority Regulations, 2016, as amended.
e) I am aware that a candidate EAP may only assist the registered EAP and work under the supervision of a registered EAP (regulation 14(6) in the S24H Registration Authority Regulations, 2016, as amended) such as myself. I take full responsibility for the work conducted.
f) I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
g) I will take into account, to the extent possible, the matters listed in Regulation 13 of the EIA Regulations and Regulation 14 of S24H of Section 24H Registration Authority Regulations, 2016, as amended, when preparing the application and any report relating to the application;
h) I undertake to disclose to the applicant and the Competent Authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the Competent Authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the Competent Authority, unless access to that information is protected by law, in which case it will be indicated that such information exists and will be provided to the Competent Authority;
i) I will perform all obligations as expected from an environmental assessment practitioner in terms of the EIA Regulations and S24H of NEMA ; and
j) I am aware of what constitutes an offence in terms of Regulation 48 and that a person convicted of an offence in terms of Regulation 48(1) is liable to the penalties as contemplated in Section 49B of the Act and EIA Regulations and Regulation 18 and 20 of S24H Registration Authority Regulations, 2016, as amended.

Disclosure of Vested Interest (delete whichever is not applicable)

k) I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the EIA Regulations;
l) ~~I have a vested interest in the proposed activity proceeding, such vested interest being:~~
~~Click or tap here to enter text.~~



Signature of the registered environmental assessment practitioner

WSP Group Africa (Pty) Ltd
Name of company:

Thursday, 10 April 2025
Date

UNDERTAKING UNDER OATH/ AFFIRMATION

I, ___**Ashlea Strong**_____swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the registered Environmental Assessment Practitioner

WSP Group Africa (Pty) Ltd

Name of Company

10/04/2025

Date

Signature of the Commissioner of Oaths

Tracy Skinner
Commissioner of Oaths
Ex-Officio Professional GISc Practitioner (PGP 1356)
Magwa Crescent West, Waterfall City
Midrand

10/04/2025

Date

Reference: **2025-02-0015**

10 April 2025

AFFIRMATION BY ENVIRONMENTAL ASSESSMENT PRACTITIONER

As required in terms of Appendix 2, subsection (j) and (k) of Government Notice Regulation (GNR) 982 (as amended)

Project Name:	The Proposed Phefumula Emoyeni One Wind Energy Facility and associated infrastructure
Consultant:	WSP Group Africa (Pty) Ltd
EAP Details	
Contact Person:	Ashlea Strong
Physical Address:	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand 1685 South Africa
Telephone:	011 361 1392
Email:	Ashlea.strong@wsp.com

I, Ashlea Strong, the appointed Environmental Assessment Practitioner (EAP), confirm through this affirmation as required in terms of Appendix 2 subsection (j) and (k) of GNR 982) (as amended) that:

i. To the best of my knowledge the information provided in this report is factually correct
ii. To the best of my knowledge all relevant project information which has been provided to stakeholders and interested and affected parties (I&APs) is correct
iii. All comments and inputs received from stakeholders / I&APs, prior to the submission of the Scoping Report, have been included as part of the Scoping Report and addressed where necessary
iv. All responses provided to comments received from stakeholders / I&APs are the unbiased opinion of the EAP and are based on factually correct information
v. The level of agreement between the EAP and stakeholder / I&APs in the Plan of Study for the undertaking of the Environmental Impact Assessment has been agreed upon.

Signature of the EAP	Signature - Commissioner of Oaths
WSP Group Africa (Pty) Ltd	10 APRIL 2025
Company	Date
10 April 2025	Tracy Skinner Commissioner of Oaths Ex-Officio Professional GISc Practitioner (PGP 1356) Magwa Crescent West, Waterfall City Midrand
Date	Stamp:

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

Tel.: +27 11 254 4800
wsp.com

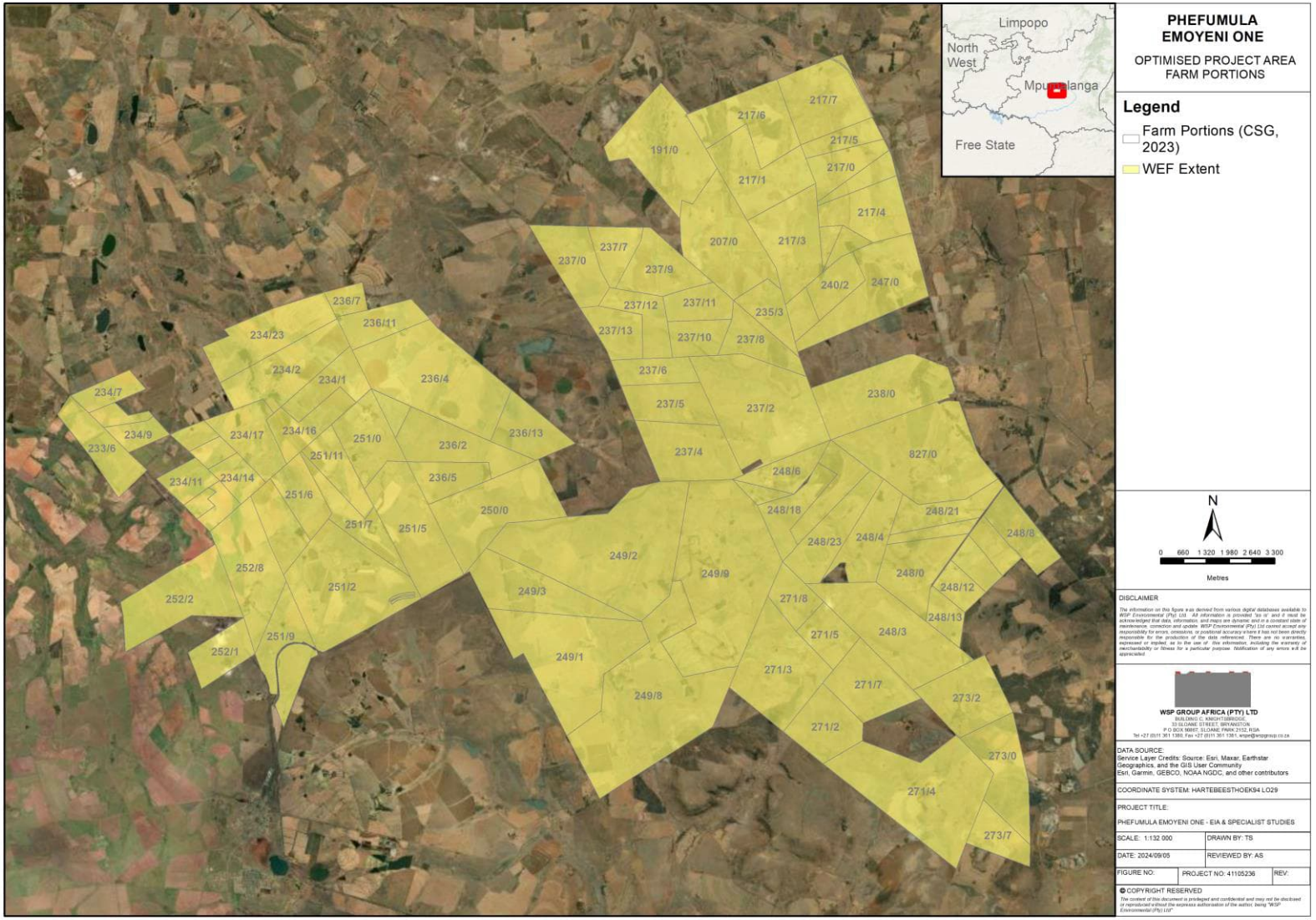
Appendix C

MAPS

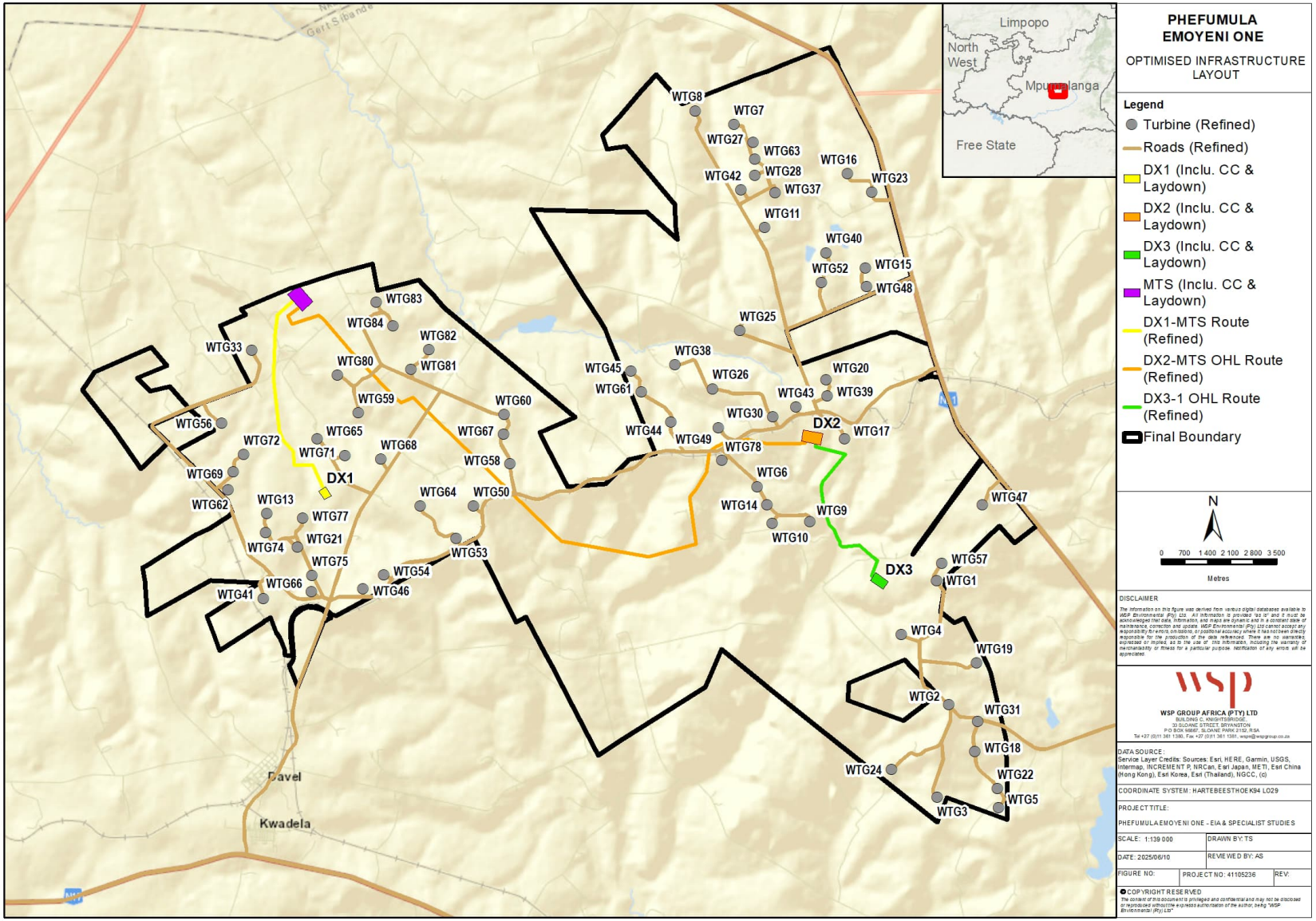
Public

APPENDIX C - MAPS

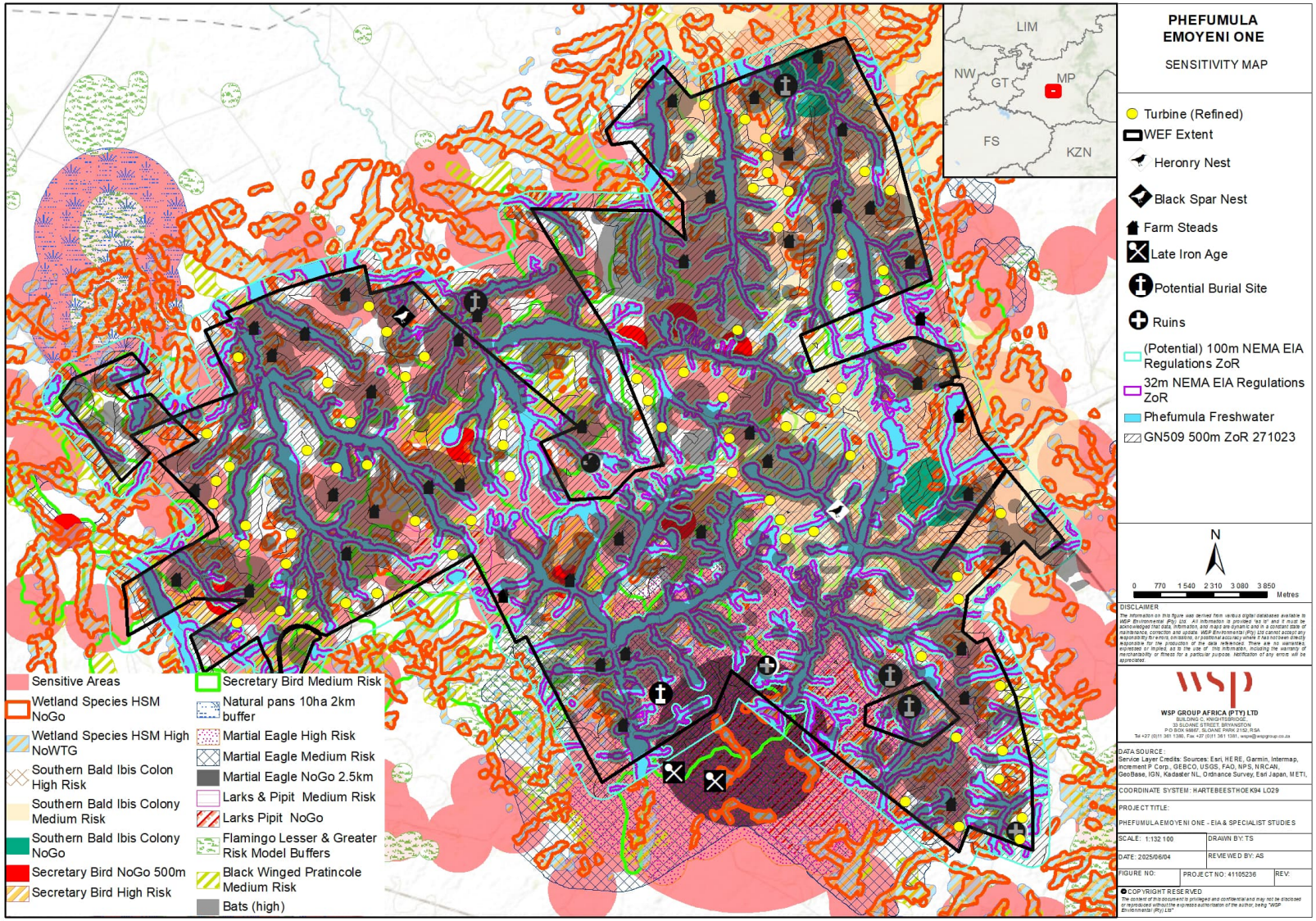
Project Boundary



Refined Layout



Sensitivity Map



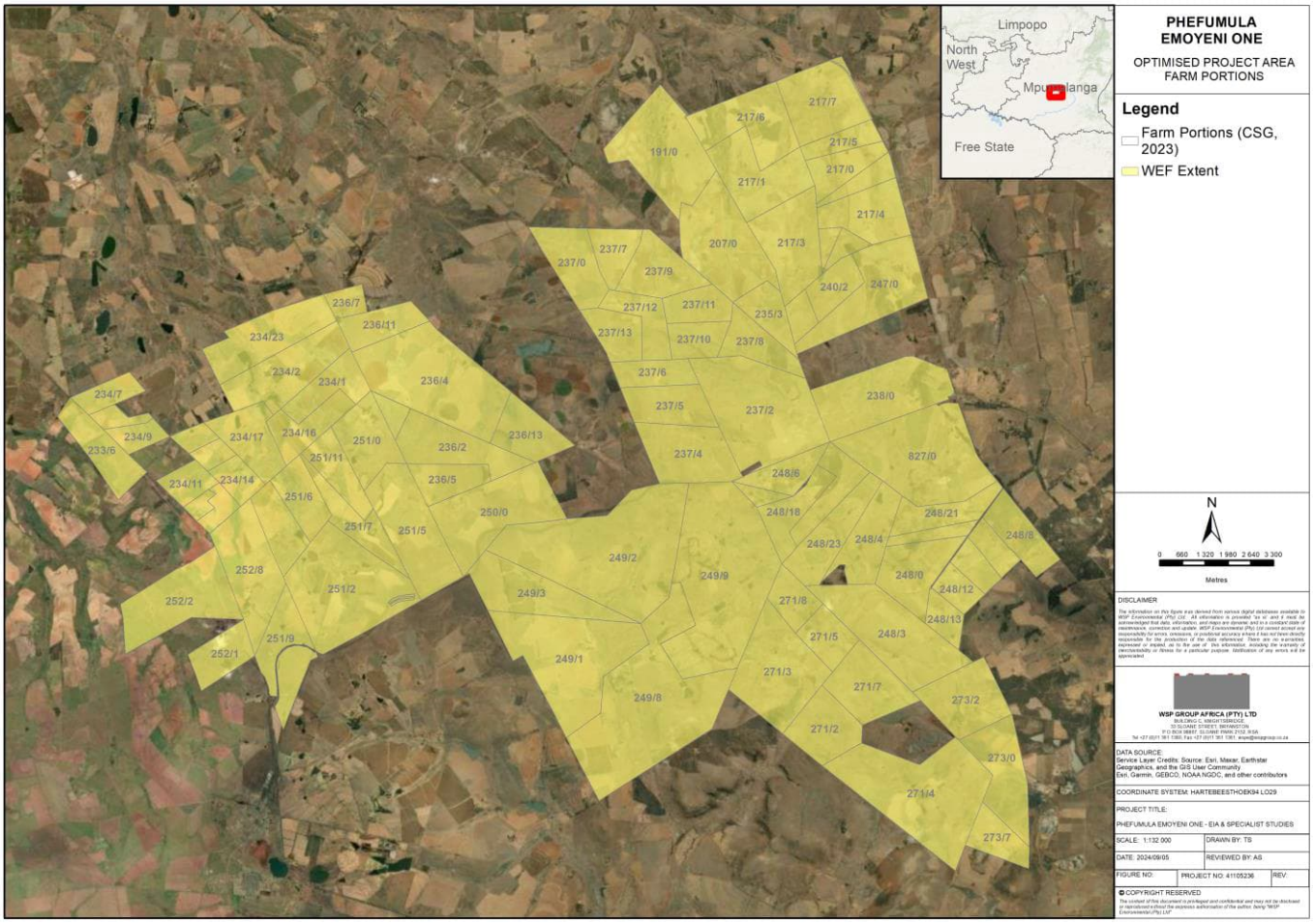
Appendix D

PROJECT INFRASTRUCTURE CO-ORDINATES

Public

APPENDIX D – INFRASTRUCTURE CO-ORDINATES

Project Boundary – Farm Portions



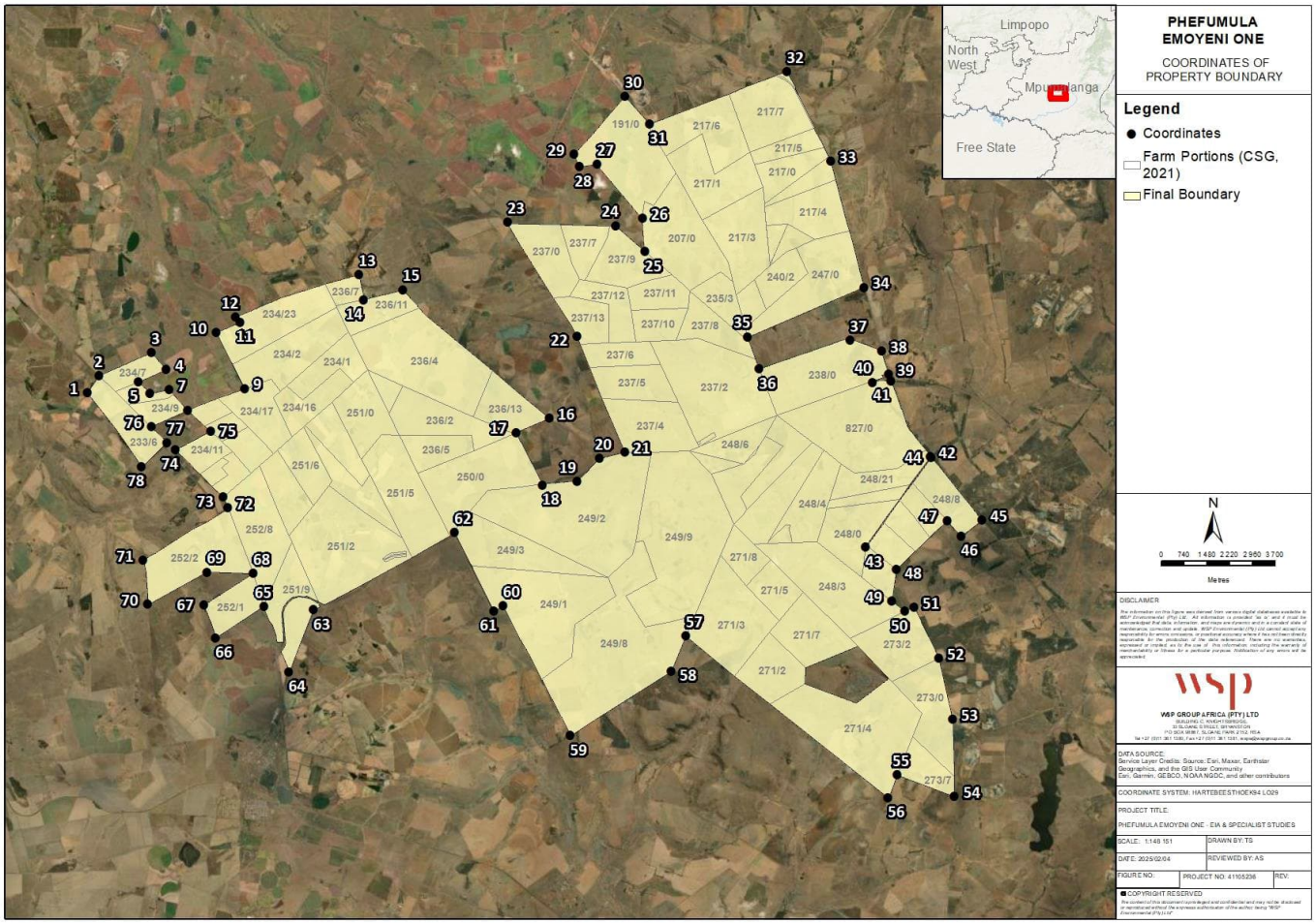
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T0IS00000000020700000	ISRAEL 207 IS	207	0
T0IS00000000021700000	BOSMANSKRANS 217 IS	217	0
T0IS00000000021700001	BOSMANSKRANS 217 IS	217	1
T0IS00000000021700003	BOSMANSKRANS 217 IS	217	3
T0IS00000000021700004	BOSMANSKRANS 217 IS	217	4
T0IS00000000021700005	BOSMANSKRANS 217 IS	217	5
T0IS00000000021700006	BOSMANSKRANS 217 IS	217	6
T0IS00000000021700007	BOSMANSKRANS 217 IS	217	7
T0IS00000000021700008	BOSMANSKRANS 217 IS	217	8
T0IS00000000021700009	BOSMANSKRANS 217 IS	217	9
T0IS00000000021700013	BOSMANSKRANS 217 IS	217	13

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000021700014	BOSMANSKRANS 217 IS	217	14
T0IS00000000023300006	VAALBANK 233 IS	233	6
T0IS00000000023400001	KUILFONTEIN No. 234-IS	234	1
T0IS00000000023400002	KUILFONTEIN No. 234-IS	234	2
T0IS00000000023400007	KUILFONTEIN No. 234-IS	234	7
T0IS00000000023400008	KUILFONTEIN No. 234-IS	234	8
T0IS00000000023400009	KUILFONTEIN No. 234-IS	234	9
T0IS00000000023400011	KUILFONTEIN No. 234-IS	234	11
T0IS00000000023400012	KUILFONTEIN No. 234-IS	234	12
T0IS00000000023400014	KUILFONTEIN No. 234-IS	234	14
T0IS00000000023400015	KUILFONTEIN No. 234-IS	234	15
T0IS00000000023400016	KUILFONTEIN No. 234-IS	234	16
T0IS00000000023400017	KUILFONTEIN No. 234-IS	234	17
T0IS00000000023400021	KUILFONTEIN No. 234-IS	234	21
T0IS00000000023400022	KUILFONTEIN No. 234-IS	234	22
T0IS00000000023400023	KUILFONTEIN No. 234-IS	234	23
T0IS00000000023500003	BOSMANSHOEK NO. 235 - IS	235	3
T0IS00000000023600002	WITBANK NO. 236 - IS	236	2
T0IS00000000023600004	WITBANK NO. 236 - IS	236	4
T0IS00000000023600005	WITBANK NO. 236 - IS	236	5
T0IS00000000023600007	WITBANK NO. 236 - IS	236	7
T0IS00000000023600010	WITBANK NO. 236 - IS	236	10
T0IS00000000023600011	WITBANK NO. 236 - IS	236	11
T0IS00000000023600013	WITBANK NO. 236 - IS	236	13
T0IS00000000023700000	NOOITGEDACHT 237 IS	237	0
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T0IS00000000024000001	GELIKSDRAAI No. 240 -IS	240	1

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000024000002	GELIKSDRAAI No. 240 -IS	240	2
T0IS00000000024700000	ELIM No. 247- IS	247	0
T0IS00000000024800000	KRANSPOORT 248 IS	248	0
T0IS00000000024800002	KRANSPOORT 248 IS	248	2
T0IS00000000024800003	KRANSPOORT 248 IS	248	3
T0IS00000000024800004	KRANSPOORT 248 IS	248	4
T0IS00000000024800006	KRANSPOORT 248 IS	248	6
T0IS00000000024800008	KRANSPOORT 248 IS	248	8
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T0IS00000000024800012	KRANSPOORT 248 IS	248	12
T0IS00000000024800013	KRANSPOORT 248 IS	248	13
T0IS00000000024800018	KRANSPOORT 248 IS	248	18
T0IS00000000024800019	KRANSPOORT 248 IS	248	19
T0IS00000000024800021	KRANSPOORT 248 IS	248	21
T0IS00000000024800022	KRANSPOORT 248 IS	248	22
T0IS00000000024800023	KRANSPOORT 248 IS	248	23
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T0IS00000000024900002	TWEEFONTEIN 249 IS	249	2
T0IS00000000024900003	TWEEFONTEIN 249 IS	249	3
T0IS00000000024900008	TWEEFONTEIN 249 IS	249	8
T0IS00000000024900009	TWEEFONTEIN 249 IS	249	9
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T0IS00000000025100007	NOOITGEDACHT 251 IS	251	7
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T0IS00000000025200008	SPION KOP 252 IS	252	8
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T0IS00000000027100003	MIDDELPLAAT 271 IS	271	3
T0IS00000000027100004	MIDDELPLAAT 271 IS	271	4
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T0IS00000000027100007	MIDDELPLAAT 271 IS	271	7
T0IS00000000027100008	MIDDELPLAAT 271 IS	271	8

21 Digit Code or LPI	Farm Name	Parcel Number	Portion Number
T0IS00000000027300000	DRIEHOEK No. 273- IS	273	0
T0IS00000000027300002	DRIEHOEK No. 273- IS	273	2
T0IS00000000027300007	DRIEHOEK No. 273- IS	273	7
T0IS00000000082700000	KRANSPOORT 827 IS	827	0

Project Boundary – Co-ordinates

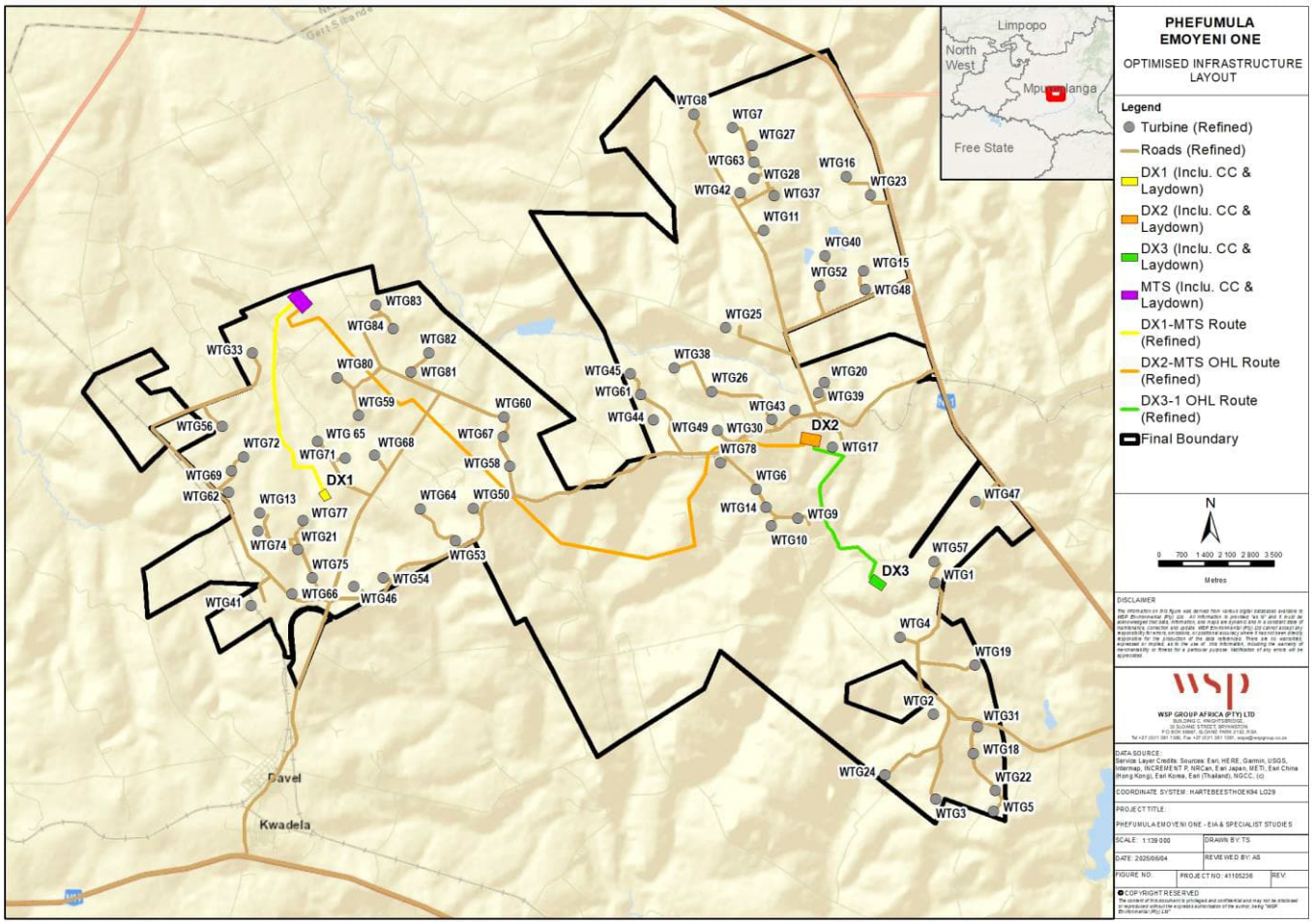


LABEL	LATITUDE	LONGITUDE
1	29° 36' 30.930" E	26° 20' 28.224" S
2	29° 36' 44.472" E	26° 20' 10.448" S
3	29° 37' 46.471" E	26° 19' 45.909" S
4	29° 38' 3.823" E	26° 20' 3.789" S
5	29° 37' 31.069" E	26° 20' 16.497" S
6	29° 37' 45.379" E	26° 20' 29.083" S
7	29° 38' 6.762" E	26° 20' 24.455" S
8	29° 38' 28.935" E	26° 20' 46.667" S
9	29° 39' 35.851" E	26° 20' 23.104" S
10	29° 39' 2.349" E	26° 19' 24.172" S

LABEL	LATITUDE	LONGITUDE
11	29° 39' 30.331" E	26° 19' 13.221" S
12	29° 39' 24.879" E	26° 19' 7.371" S
13	29° 41' 49.073" E	26° 18' 22.296" S
14	29° 41' 55.046" E	26° 18' 48.250" S
15	29° 42' 40.257" E	26° 18' 37.896" S
16	29° 45' 33.046" E	26° 20' 52.865" S
17	29° 44' 54.243" E	26° 21' 7.983" S
18	29° 45' 25.343" E	26° 22' 2.001" S
19	29° 46' 7.039" E	26° 21' 58.806" S
20	29° 46' 32.568" E	26° 21' 34.662" S
21	29° 47' 1.791" E	26° 21' 28.271" S
22	29° 45' 59.499" E	26° 19' 16.707" S
23	29° 44' 42.966" E	26° 17' 27.466" S
24	29° 46' 49.828" E	26° 17' 28.979" S
25	29° 47' 24.374" E	26° 17' 56.190" S
26	29° 47' 20.597" E	26° 17' 20.836" S
27	29° 46' 26.928" E	26° 16' 24.019" S
28	29° 46' 6.342" E	26° 16' 26.992" S
29	29° 46' 0.629" E	26° 16' 13.630" S
30	29° 47' 0.006" E	26° 15' 12.702" S
31	29° 47' 28.358" E	26° 15' 41.821" S
32	29° 50' 9.465" E	26° 14' 45.019" S
33	29° 51' 1.101" E	26° 16' 19.232" S
34	29° 51' 41.481" E	26° 18' 32.079" S
35	29° 49' 24.794" E	26° 19' 25.488" S
36	29° 49' 38.726" E	26° 19' 59.422" S
37	29° 51' 25.695" E	26° 19' 26.687" S
38	29° 52' 1.753" E	26° 19' 39.007" S
39	29° 52' 10.082" E	26° 20' 3.247" S
40	29° 51' 52.240" E	26° 20' 12.739" S
41	29° 52' 13.833" E	26° 20' 11.067" S
42	29° 52' 34.683" E	26° 21' 0.688" S
43	29° 53' 0.004" E	26° 21' 29.222" S
44	29° 51' 45.184" E	26° 23' 6.916" S
45	29° 53' 2.657" E	26° 21' 32.064" S
46	29° 54' 1.835" E	26° 22' 37.299" S
47	29° 53' 36.860" E	26° 22' 54.353" S
48	29° 53' 20.476" E	26° 22' 38.115" S
49	29° 52' 21.367" E	26° 23' 29.733" S
50	29° 52' 16.238" E	26° 24' 3.466" S
51	29° 52' 31.496" E	26° 24' 14.361" S
52	29° 52' 42.241" E	26° 24' 9.680" S

LABEL	LATITUDE	LONGITUDE
53	29° 53' 12.166" E	26° 25' 3.531" S
54	29° 53' 29.174" E	26° 26' 8.395" S
55	29° 53' 31.006" E	26° 27' 28.948" S
56	29° 52' 24.249" E	26° 27' 7.059" S
57	29° 52' 14.037" E	26° 27' 31.302" S
58	29° 48' 15.264" E	26° 24' 41.763" S
59	29° 47' 58.070" E	26° 25' 19.155" S
60	29° 46' 0.518" E	26° 26' 27.595" S
61	29° 44' 39.802" E	26° 24' 10.765" S
62	29° 44' 29.440" E	26° 24' 16.388" S
63	29° 43' 37.579" E	26° 22' 56.701" S
64	29° 40' 57.639" E	26° 24' 16.511" S
65	29° 40' 29.515" E	26° 25' 21.761" S
66	29° 39' 58.933" E	26° 24' 12.927" S
67	29° 39' 3.340" E	26° 24' 46.143" S
68	29° 38' 48.955" E	26° 24' 11.894" S
69	29° 39' 47.034" E	26° 23' 38.499" S
70	29° 38' 52.712" E	26° 23' 36.802" S
71	29° 37' 43.688" E	26° 24' 11.647" S
72	29° 37' 38.025" E	26° 23' 24.553" S
73	29° 39' 16.809" E	26° 22' 29.455" S
74	29° 39' 11.262" E	26° 22' 17.876" S
75	29° 38' 14.737" E	26° 21' 28.219" S
76	29° 38' 55.632" E	26° 21' 8.035" S
77	29° 37' 45.715" E	26° 21' 3.818" S
78	29° 38' 5.524" E	26° 21' 20.218" S
79	29° 37' 35.628" E	26° 21' 46.305" S
81	29° 51' 36.661" E	26° 24' 51.036" S
82	29° 50' 35.818" E	26° 25' 14.473" S
83	29° 50' 34.950" E	26° 25' 31.517" S
84	29° 51' 35.723" E	26° 25' 51.471" S
85	29° 52' 13.204" E	26° 25' 25.229" S
86	29° 41' 10.891" E	26° 24' 10.756" S
87	29° 40' 40.310" E	26° 24' 1.416" S
88	29° 40' 20.845" E	26° 24' 18.924" S
89	29° 40' 22.710" E	26° 24' 50.902" S
90	29° 40' 15.543" E	26° 24' 50.310" S
91	29° 40' 20.116" E	26° 25' 0.608" S
92	29° 40' 25.057" E	26° 24' 51.237" S
93	29° 40' 28.526" E	26° 24' 8.262" S
94	29° 40' 54.270" E	26° 24' 4.425" S
95	29° 41' 5.168" E	26° 24' 13.183" S

Turbine Positions – Co-ordinates



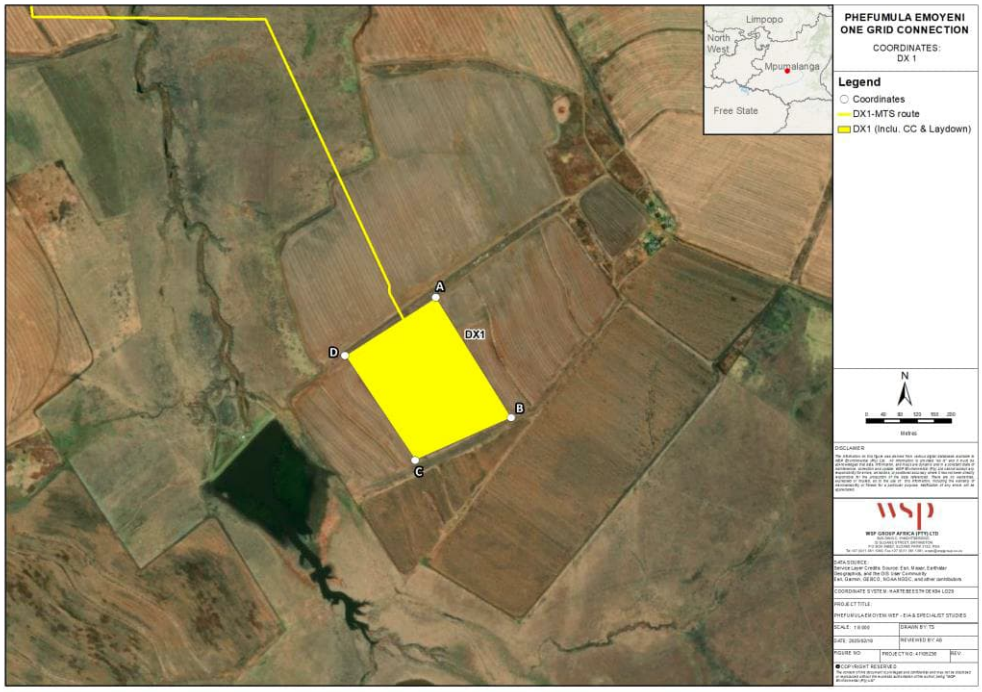
NAME	LATITUDE	LONGITUDE
WTG01	26° 23' 32.779" S	29° 52' 11.760" E
WTG02	26° 25' 35.341" S	29° 52' 26.339" E
WTG03	26° 27' 7.174" S	29° 52' 14.205" E
WTG04	26° 24' 26.767" S	29° 51' 33.554" E
WTG05	26° 27' 17.266" S	29° 53' 21.966" E
WTG06	26° 22' 0.908" S	29° 48' 53.956" E
WTG07	26° 16' 2.372" S	29° 48' 25.623" E
WTG08	26° 15' 49.048" S	29° 47' 42.927" E
WTG09	26° 22' 35.257" S	29° 49' 51.921" E
WTG10	26° 22' 36.954" S	29° 49' 10.675" E
WTG11	26° 17' 44.024" S	29° 49' 0.612" E
WTG13	26° 22' 30.562" S	29° 39' 54.494" E
WTG14	26° 22' 19.071" S	29° 49' 4.933" E
WTG15	26° 18' 23.563" S	29° 50' 51.105" E
WTG16	26° 16' 50.360" S	29° 50' 31.168" E
WTG17	26° 21' 13.289" S	29° 50' 29.642" E

NAME	LATITUDE	LONGITUDE
WTG18	26° 26' 21.947" S	29° 52' 55.415" E
WTG19	26° 24' 54.164" S	29° 52' 56.316" E
WTG20	26° 20' 14.363" S	29° 50' 8.601" E
WTG21	26° 23' 3.359" S	29° 40' 28.868" E
WTG22	26° 26' 58.571" S	29° 53' 20.189" E
WTG23	26° 17' 8.464" S	29° 50' 57.762" E
WTG24	26° 26' 40.244" S	29° 51' 23.572" E
WTG25	26° 19' 26.294" S	29° 48' 33.544" E
WTG26	26° 20' 24.232" S	29° 48' 4.231" E
WTG27	26° 16' 19.941" S	29° 48' 47.100" E
WTG28	26° 16' 52.363" S	29° 48' 49.386" E
WTG30	26° 20' 51.584" S	29° 49' 10.582" E
WTG31	26° 25' 51.736" S	29° 52' 58.184" E
WTG33	26° 19' 48.748" S	29° 39' 37.249" E
WTG37	26° 17' 9.433" S	29° 49' 11.574" E
WTG38	26° 20' 0.923" S	29° 47' 22.938" E
WTG39	26° 20' 30.498" S	29° 50' 10.376" E
WTG40	26° 18' 8.758" S	29° 50' 8.180" E
WTG41	26° 23' 54.855" S	29° 39' 51.609" E
WTG42	26° 17' 6.907" S	29° 48' 34.231" E
WTG43	26° 20' 42.013" S	29° 49' 36.053" E
WTG44	26° 20' 57.437" S	29° 47' 18.546" E
WTG45	26° 20' 7.175" S	29° 46' 34.373" E
WTG46	26° 23' 44.476" S	29° 41' 41.095" E
WTG47	26° 22' 17.562" S	29° 53' 1.887" E
WTG48	26° 18' 42.238" S	29° 50' 52.600" E
WTG49	26° 21' 2.816" S	29° 48' 11.078" E
WTG50	26° 22' 21.652" S	29° 43' 42.249" E
WTG52	26° 18' 38.548" S	29° 50' 2.784" E
WTG53	26° 22' 53.926" S	29° 43' 22.885" E
WTG54	26° 23' 30.802" S	29° 42' 3.498" E
WTG56	26° 21' 1.353" S	29° 39' 4.700" E
WTG57	26° 23' 15.662" S	29° 52' 17.237" E
WTG58	26° 21' 39.731" S	29° 44' 22.084" E
WTG59	26° 20' 50.239" S	29° 41' 35.002" E
WTG60	26° 20' 50.946" S	29° 44' 15.291" E
WTG61	26° 20' 27.674" S	29° 46' 45.919" E
WTG62	26° 22' 7.034" S	29° 39' 12.116" E
WTG63	26° 16' 36.355" S	29° 48' 49.157" E
WTG64	26° 22' 22.324" S	29° 42' 43.449" E
WTG65	26° 21' 16.287" S	29° 40' 49.727" E
WTG66	26° 23' 47.265" S	29° 40' 44.327" E

NAME	LATITUDE	LONGITUDE
WTG67	26° 21' 10.569" S	29° 44' 14.793" E
WTG68	26° 21' 35.975" S	29° 42' 0.030" E
WTG69	26° 21' 49.182" S	29° 39' 17.327" E
WTG71	26° 21' 32.667" S	29° 41' 20.622" E
WTG72	26° 21' 31.969" S	29° 39' 28.631" E
WTG74	26° 22' 49.527" S	29° 39' 53.629" E
WTG75	26° 23' 31.552" S	29° 40' 44.778" E
WTG77	26° 22' 34.920" S	29° 40' 34.113" E
WTG78	26° 21' 34.848" S	29° 48' 14.534" E
WTG80	26° 20' 12.799" S	29° 41' 11.375" E
WTG81	26° 20' 6.574" S	29° 42' 32.447" E
WTG82	26° 19' 47.406" S	29° 42' 52.173" E
WTG83	26° 19' 0.508" S	29° 41' 53.649" E
WTG84	26° 19' 24.051" S	29° 42' 12.257" E

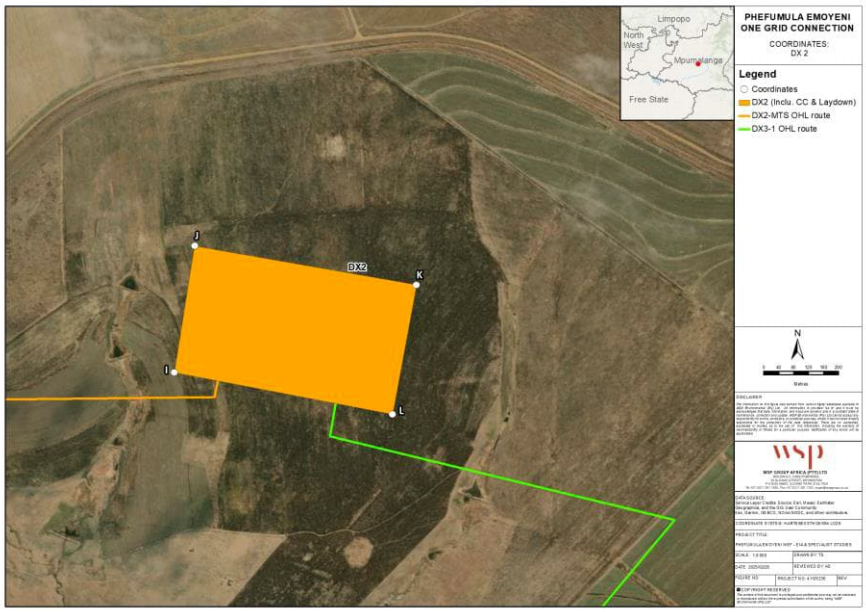
Infrastructure Co-ordinates

Co-ordinate Points of the DX1 Substation (inclusive of IPP Substation, Laydown Area and Construction Camp)

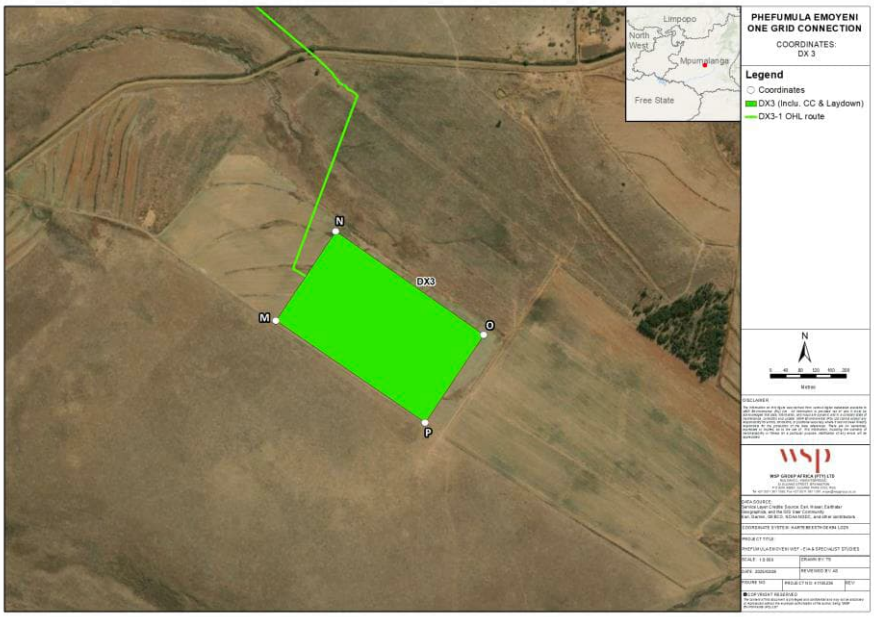
Point	Longitude	Latitude
		
A	29° 40' 59.138" E	26° 22' 3.091" S
B	29° 41' 5.570" E	26° 22' 12.267" S

Point	Longitude	Latitude
C	29° 40' 57.447" E	26° 22' 15.561" S
D	29° 40' 51.419" E	26° 22' 7.555" S

Co-ordinate Points of the DX2 Substation (inclusive of IPP Substation, Laydown Area and Construction Camp)

Point	Longitude	Latitude
		
I	29° 49' 42.183" E	26° 21' 15.194" S
J	29° 49' 44.064" E	26° 21' 4.175" S
K	29° 50' 5.482" E	26° 21' 7.446" S
L	29° 50' 3.254" E	26° 21' 18.688" S

Co-ordinate Points of DX3 (inclusive of IPP Substation, Laydown Area and Construction Camp)

Point	Longitude	Latitude
		
M	29° 50' 58.578" E	26° 23' 32.594" S
N	29° 51' 4.239" E	26° 23' 24.870" S
O	29° 51' 18.456" E	26° 23' 33.720" S
P	29° 51' 12.902" E	26° 23' 41.303" S

Appendix E

GENERIC EMPR - SUBSTATIONS

Public

GENERIC ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) FOR THE DEVELOPMENT AND EXPANSION OF SUBSTATION INFRASTRUCTURE FOR THE TRANSMISSION AND DISTRIBUTION OF ELECTRICITY



environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

TABLE OF CONTENTS

INTRODUCTION 1
1. Background 1
2. Purpose 1
3. Objective 1
4. Scope 1
5. Structure of this document 1
6. Completion of part B: section 1: the pre-approved generic EMPr template 4
7. Amendments of the impact management outcomes and impact management actions 4
8. Documents to be submitted as part of part B: section 2 site specific information and declaration 4
(a) Amendments to Part B: Section 2 – site specific information and declaration 5
PART A – GENERAL INFORMATION 6
1. DEFINITIONS 6
2. ACRONYMS and ABBREVIATIONS 7
3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION 8
4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE 14
4.1 Document control/Filing system 14
4.2 Documentation to be available 14
4.3 Weekly Environmental Checklist 14
4.4 Environmental site meetings 14
4.5 Required Method Statements 15
4.6 Environmental Incident Log (Diary) 15
4.7 Non-compliance 16
4.8 Corrective action records 17
4.9 Photographic record 17
4.10 Complaints register 17
4.11 Claims for damages 18
4.12 Interactions with affected parties 18
4.13 Environmental audits 18
4.14 Final environmental audits 19
PART B: SECTION 1: Pre-approved generic EMPr template 19
5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS 19
5.1 Environmental awareness training 21

5.2 Site Establishment development 22
5.3 Access restricted areas 23
5.4 Access roads 24
5.5 Fencing and Gate installation 25
5.6 Water Supply Management 26
5.7 Storm and waste water management 27
5.8 Solid and hazardous waste management 28
5.9 Protection of watercourses and estuaries 29
5.10 Vegetation clearing 31
5.11 Protection of fauna 32
5.12 Protection of heritage resources 33
5.13 Safety of the public 34
5.14 Sanitation 34
5.15 Prevention of disease 35
5.16 Emergency procedures 36
5.17 Hazardous substances 37
5.18 Workshop, equipment maintenance and storage 39
5.19 Batching plants 40
5.20 Dust emissions 41
5.21 Blasting 42
5.22 Noise 43
5.23 Fire prevention 43
5.24 Stockpiling and stockpile areas 44
5.25 Civil works 45
5.26 Excavation of foundation, cable trenching and drainage systems 46
5.27 Installation of foundations, cable trenching and drainage systems 47
5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches) 47
5.30 Cabling and Stringing 48
5.31 Testing and Commissioning (all equipment testing, earthing system, system integration) 49
5.32 Socio-economic 49
5.33 Temporary closure of site 50
5.34 Dismantling of old equipment 51
5.35 Landscaping and rehabilitation 52

6 ACCESS TO THE GENERIC EMPr 54
PART B: SECTION 2 54
7 SITE SPECIFIC INFORMATION AND DECLARATION 54
7.1 Sub-section 1: contact details and description of the project 54
7.2 Sub-section 2: Development footprint site map 60
8.1 Sub-section 3: Declaration 65
8.2 Sub-section 4: amendments to site specific information (Part B; section 2) 65
9 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES 66

List of tables

Table 1: *Guide to roles and responsibilities for implementation of an EMPr* 8

List of Figures

Figure 1: Locality map for the proposed Marang BESS and associated grid infrastructure 57

INTRODUCTION

1. Background

The National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) requires that an environmental management programme (EMPr) be submitted where an environmental impact assessment (EIA) has been identified as the environmental instrument to be utilised as the basis for a decision on an application for environmental authorisation (EA). The content of an EMPr must either contain the information set out in Appendix 4 of the Environmental Impact Assessment Regulations, 2014, as amended (EIA Regulations) 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 competent authority (CA).

2. Purpose

This document constitutes a generic EMPr relevant to applications for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and all listed and specified activities necessary for the realisation of such infrastructure.

3. Objective

The objective of this 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 substation infrastructure for the transmission and distribution of electricity. The use of a generic EMPr is intended to reduce the need to prepare and review individual EMPrs for applications of a similar nature.

4. Scope

The scope of this generic EMPr applies to the development or expansion of substation infrastructure for the transmission and distribution of electricity requiring EA in terms of NEMA. This generic EMPr applies to activities requiring EA, mainly activity 11 and 47 of the Environmental Impact Assessment Regulations Listing Notice 1 of 2014, as amended, and activity 9 of the Environmental Impact Assessment Regulations Listing Notice 2 of 2014, as amended, and all associated listed or specified activities necessary for the realization of such infrastructure.

5. Structure of this document

This document is structured in three parts with an Appendix as indicated in the table below:

Part	Section	Heading	Content
A		Provides general guidance and information and is **not legally binding**	Definitions, acronyms, roles & responsibilities and documentation and reporting.
B	1	Pre-approved generic EMPr template	Contains generally accepted impact management outcomes and impact

Part	Section	Heading	Content
			management actions required for the avoidance, management and mitigation of impacts and risks associated with the development or expansion of substation infrastructure for the transmission and distribution of electricity, which are presented in the form of a template that has been pre-approved. The template in this section is to be completed by the contractor, with each completed page signed and dated by the holder of the EA prior to commencement of the activity. Where an impact management outcome is not relevant, the words "not applicable" can be inserted in the template under the "responsible persons" column. Once completed and signed, the template represents the EMPr for the activity approved by the CA and is legally binding. The template **is not required** to be submitted to the CA as once the generic EMPr is gazetted for implementation, it has been approved by the CA. To allow interested and affected parties access to the pre-approved EMPr template for consideration through the decision-making process, the EAP on behalf of the applicant /proponent must make the hard copy of this EMPr available at a public location and where the applicant has a website, the EMPr should also be made available on such publicly accessible website.
	2	Site specific information	Contains preliminary infrastructure layout and a declaration that the applicant/holder of the EA will comply with the pre-approved generic EMPr template contained in Part B: Section 1, and understands that the impact management outcomes and impact management actions are **legally binding**. The preliminary infrastructure layout must be finalized to inform the final EMPr that is to be submitted with the basic assessment report (BAR) or environmental impact assessment report (EIAR), ensuring that all impact management outcomes and impact management actions have been either pre-approved or approved in terms of Part C.

Part	Section	Heading	Content
			This section **must be** submitted to the CA together with the final BAR or EIAR. The information submitted to the CA will be considered to be incomplete should a signed copy of Part B: section 2 not be submitted. Once approved, this Section forms part of the EMPr for the development and is legally binding.
C		Site specific sensitivities/ attributes	If any specific environmental sensitivities/ attributes are present on the site which require site specific impact management outcomes and impact management actions, not included in the pre-approved generic EMPr, to manage impacts, these specific impact management outcomes and impact management actions must be included in this section. These specific environmental attributes must be referenced spatially and impact management outcomes and impact management actions must be provided. These specific impact management outcomes and impact management actions must be presented in the format of the pre-approved EMPr template (Part B: section 1) This section will not be required should the site contain no specific environmental sensitivities or attributes. However, if Part C is applicable to the site, it **is required** to be submitted together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. Once approved, Part C forms part of the EMPr for the site and is legally binding. This section applies only **to additional** impact management outcomes and impact management actions that are necessary for the avoidance, management and mitigation of impacts and risks associated with the specific development or expansion and which are not already included in Part B: section 1.
Appendix 1			Contains the method statements to be prepared prior to commencement of the activity. The method statements are **not required** to be submitted to the competent authority.

6. Completion of part B: section 1: the pre-approved generic EMPr template

The template is to be completed prior to commencement of the activity, by providing the following information for each environmental impact management action:

- For implementation
  - a 'responsible person',
  - a method for implementation,
  - a timeframe for implementation
- For monitoring
  - a responsible person
  - frequency
  - evidence of compliance.

The completed template must be signed and dated by the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must be signed and dated on each page by the holder of the EA. This template once signed and dated is legally binding. The holder of the EA will remain responsible for its implementation.

7. Amendments of the impact management outcomes and impact management actions

Once the activity has commenced, a holder of an EA may make amendments to the impact management outcomes and impact management actions in the following manner:

- Amendment of the impact management outcomes: in line with the process contemplated in Regulation 37 of the EIA Regulations; and
- Amendment of the impact management actions: in line with the process contemplated in Regulation 36 of the EIA Regulations.

8. Documents to be submitted as part of part B: section 2 site specific information and declaration

Part B: Section 2 has three distinct sub-sections. The first and third sub-sections are in a template format. Sub-section two requires a map to be produced.

Sub-section 1 contains the project name, the applicant's name and contact details, the site information, which includes coordinates of the property or farm in which the proposed substation infrastructure is proposed as well as the 21-digit Surveyor General code of each cadastral land parcel and, where available, the farm name.

Sub-section 2 is to be prepared by an EAP and must contain his/her name and expertise including a curriculum vitae. This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout using the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features and within 50 m from the development footprint.

Sub-section 3 is the declaration that the applicant (s)/proponent (s) or holder of the EA in the case of a change of ownership must complete which confirms that the applicant/EA holder will comply with the pre-approved 'generic EMPr' template in Section 1 and understands that the impact management outcomes and impact management actions are legally binding.

(a) Amendments to Part B: Section 2 – site specific information and declaration

Should the EA be transferred, Part B: Section 2 must be completed by the new applicant/proponent and submitted with the application for an amendment of the EA in terms of regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted as part of such an application for an amendment to an EA will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART A – GENERAL INFORMATION

1. DEFINITIONS

In this EMPr any word or expression to which a meaning has been assigned in the NEMA or EIA Regulations has that meaning, and unless the context requires otherwise –

"clearing" means the clearing and removal of vegetation, whether partially or in whole, including trees and shrubs, as specified;

"construction camp" is the area designated for key construction infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and lay down areas, hazardous storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management;

"contractor" - The Contractor has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract, are in line with the Environmental Management Programme and that Method Statements are implemented as described.

"**hazardous substance**" is a substance governed by the Hazardous Substances Act, 1973 (Act No. 15 of 1973) as well as the Hazardous Chemical and Substances Regulations, 1995;

"method statement" means a written submission by the Contractor to the Project Manager in response to this EMPr or a request by the Project Manager and ECO. The method statement must set out the equipment, materials, labour and method(s) the Contractor proposes using to carry out an activity identified by the Project Manager when requesting the Method Statement. This must be done in such detail that the Project Manager and ECO is able to assess whether the Contractor's proposal is in accordance with this specification and/or will produce results in accordance with this specification;

The method statement must cover as a minimum applicable details with regard to:

(i) Construction procedures;
(ii) Plant, materials and equipment to be used;
(iii) Transporting the equipment to and from site;
(iv) How the plant/ material/ equipment will be moved while on site;
(v) How and where the plant/ material/ equipment will be stored;
(vi) The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
(vii) Timing and location of activities;
(viii) Compliance/ non-compliance; and
(ix) Any other information deemed necessary by the Project Manager.

"slope" means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

"solid waste" means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

"spoil" means excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

"topsoil" means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

"works" means the works to be executed in terms of the Contract

2. ACRONYMS and ABBREVIATIONS

CA	Competent Authority
cEO	Contractors Environmental Officer
dEO	Developer Environmental Officer
DPM	Developer Project Manager
DSS	Developer Site Supervisor
EAR	Environmental Audit Report
ECA	Environmental Conservation Act No. 73 of 1989
ECO	Environmental Control Officer
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
ERAP	Emergency Response Action Plan
EMPr	Environmental Management Programme Report
EAP	Environmental Assessment Practitioner
FPA	Fire Protection Agency
HCS	Hazardous chemical Substance
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act ,2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
MSDS	Material Safety Data Sheet
RI&AP's	Registered Interested and affected parties

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr) IMPLEMENTATION

The effective implementation of this generic EMPr is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the EMPr gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the holder of the EA remains responsible for ensuring that the duties indicated in this document for action by the ECO are undertaken.

Table 1: *Guide to roles and responsibilities for implementation of an EMPr*

Responsible Person(s)	Role and Responsibilities
Developer's Project Manager (DPM)	Role The Project Developer is accountable for ensuring compliance with the EMPr and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the EMPr according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent. Responsibilities - Be fully conversant with the conditions of the EA; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required; - Monitor the implementation of the EMPr throughout the project by means of site inspections and meetings. Overall management of the project and EMPr implementation; and - Ensure that periodic environmental performance audits are undertaken on the project implementation.
Developer Site Supervisor (DSS)	Role The DSS reports directly to the DPM, oversees site works, liaises with the contractor(s) and the ECO. The DSS is responsible for the day to day implementation of the EMPr and for ensuring the compliance of all contractors with the conditions and requirements stipulated in the EMPr.

Responsible Person(s)	Role and Responsibilities
	Responsibilities - Ensure that all contractors identify a contractor's Environmental Officer (cEO); - Must be fully conversant with the conditions of the EA. Oversees site works, liaison with Contractor, DPM and ECO; - Must ensure that all landowners have the relevant contact details of the site staff, ECO and cEO; - Issuing of site instructions to the Contractor for corrective actions required; - Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.
Environmental Control Officer (ECO)	Role The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits, verifying the monitoring reports submitted by the cEO. The ECO provides feedback to the DSS and Project Manager regarding all environmental matters. The Contractor, cEO and dEO are answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA and EMPr. The ECO provides feedback to the DSS and Project Manager, who in turn reports back to the Contractor and potential and Registered Interested &Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract. Decisions regarding environmental procedures, specifications and requirements which have a cost implication (i.e. those that are deemed to be a variation, not allowed for in the Performance Specification) must be endorsed by the Project Manager. The ECO must also, as specified by the EA, report to the relevant CA as and when required. Responsibilities The responsibilities of the ECO will include the following: - Be aware of the findings and conclusions of all EA related to the development;

Responsible Person(s)	Role and Responsibilities
	- Be familiar with the recommendations and mitigation measures of this EMPr; - Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them; - Undertake regular and comprehensive site inspections / audits of the construction site according to the generic EMPr and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the EMPr and environmental licenses; - Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective; - Monitoring the performance of the Contractors and ensuring compliance with the EMPr and associated Method Statements; - In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the EMPr and/or environmental licenses; - Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns; - Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the EMPr; - Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (cEO); - Checking the cEO's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken; - Checking the cEO's public complaints register in which all complaints are recorded, as well as action taken; - Assisting in the resolution of conflicts; - Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programmes of the Contractor; - In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the EMPr; - Communication of all modifications to the EMPr to the relevant stakeholders.

Responsible Person(s)	Role and Responsibilities
developer Environmental Officer (dEO)	Role The dEOs will report to the Project Manager and are responsible for implementation of the EMPr, environmental monitoring and reporting, providing environmental input to the Project Manager and Contractor's Manager, liaising with contractors and the landowners as well as a range of environmental coordination responsibilities. Responsibilities - Be fully conversant with the EMPr; - Be familiar with the recommendations and mitigation measures of this EMPr, and implement these measures; - Ensure that all stipulations within the EMPr are communicated and adhered to by the Employees, Contractor(s) ; - Confine the development site to the demarcated area; - Conduct environmental internal audits with regards to EMPr and authorisation compliance (on cEO); - Assist the contractors in addressing environmental challenges on site; - Assist in incident management: - Reporting environmental incidents to developer and ensuring that corrective action is taken, and lessons learnt shared; - Assist the contractor in investigating environmental incidents and compile investigation reports; - Follow-up on pre-warnings, defects, non-conformance reports; - Measure and communicate environmental performance to the Contractor; - Conduct environmental awareness training on site together with ECO and cEO; - Ensure that the necessary legal permits and / or licenses are in place and up to date; - Acting as Developer's Environmental Representative on site and work together with the ECO and contractor;
Contractor	Role The Contractor appoints the CEO and has overall responsibility for ensuring that all work, activities, and actions linked to the delivery of the contract are in line with the EMPr and that Method Statements are implemented as described. External contractors must ensure compliance with this EMPr while performing

Responsible Person(s)	Role and Responsibilities
	the onsite activities as per their contract with the Project Developer. The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the EMPr will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities. Responsibilities - project delivery and quality control for the development services as per appointment; - employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period; - ensure that safe, environmentally acceptable working methods and practices are implemented, and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely; - attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones; - ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in EMPr, to the satisfaction of the ECO.
contractor Environmental Officer (cEO)	Role Each Contractor affected by the EMPr should appoint a cEO, who is responsible for the on-site implementation of the EMPr (or relevant sections of the EMPr). The Contractor's representative can be the site agent; site engineer; a dedicated environmental officer; or an independent consultant. The Contractor must ensure that the Contractor's Representative is suitably qualified to perform the necessary tasks and is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public. As a minimum the cEO shall meet the following criteria: Responsibilities - Be on site throughout the duration of the project and be dedicated to the project; - Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site; - Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, EMPr and Method Statements; - Attend the Environmental Site Meeting; - Undertaking corrective actions where non-compliances are registered within the stipulated timeframes;

Responsible Person(s)	Role and Responsibilities
	- Report back formally on the completion of corrective actions; - Assist the ECO in maintaining all the site documentation; - Prepare the site inspection reports and corrective action reports for submission to the ECO; - Assist the ECO with the preparing of the monthly report; and - Where more than one Contractor is undertaking work on site, each company appointed as a Contractor will appoint a cEO representing that company.

4. ENVIRONMENTAL DOCUMENTATION REPORTING AND COMPLIANCE

To ensure accountable and demonstrated implementation of the EMPr, a number of reporting systems, documentation controls and compliance mechanisms must be in place for all substation infrastructure projects as a minimum requirement.

4.1 Document control/Filing system

The holder of the EA is solely responsible for the upkeep and management of the EMPr file. As a minimum, all documentation detailed below will be stored in the EMPr file. A hard copy of all documentation shall be filed, while an electronic copy may be kept where relevant. A duplicate file will be maintained in the office of the DSS (where applicable). This duplicate file must remain current and up-to-date. The filing system must be updated and relevant documents added as required. The EMPr file must be made available at all times on request by the CA or other relevant authorities. The EMPr file will form part of any environmental audits undertaken as prescribed in the EIA Regulations.

4.2 Documentation to be available

At the outset of the project the following preliminary list of documents shall be placed in the filing system and be accessible at all times:

- Full copy of the signed EA from the CA in terms of NEMA, granting approval for the development or expansion;
- Copy of the generic and site specific EMPr as well as any amendments thereof;
- Copy of declaration of implementing generic EMPr and subsequent approval of site specific EMPr and amendments thereof;
- All method statements;
- Completed environmental checklists;
- Minutes and attendance register of environmental site meetings;
- An up-to-date environmental incident log;
- A copy of all instructions or directives issued;
- A copy of all corrective actions signed off. The corrective actions must be filed in such a way that a clear reference is made to the non-compliance record;
- Complaints register.

4.3 Weekly Environmental Checklist

The ECOs are required to complete a Weekly Environmental Checklist, the format of which is to be agreed prior to commencement of the activity. The ECOs are required to sign and date the checklist, retain a copy in the EMPr file and submit a copy of the completed checklist to the DSS on a weekly basis.

The checklists will form the basis for the Monthly Environmental Reports. Copies of all completed checklists will be attached as Annexures to the Environmental Audit Report as required in terms of the EIA Regulations.

4.4 Environmental site meetings

Minutes of the environmental site meetings shall be kept. The minutes must include an attendance register and will be attached to the Monthly Report that is distributed to

attendees. Each set of minutes must clearly record "Matters for Attention" that will be reviewed at the next meeting.

4.5 Required Method Statements

The method statement will be done in such detail that the ECOs are enabled to assess whether the contractor's proposal is in accordance with the EMPr.

The method statement must cover applicable details with regard to:

- development procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/ non-compliance with the EMPr; and
- any other information deemed necessary by the ECOs.

Unless indicated otherwise by the Project Manager, the Contractor shall provide the following method statements to the Project Manager no less than 14 days prior to the commencement date of the activity:

- Site establishment – Camps, Lay-down or storage areas, satellite camps, infrastructure;
- Batch plants;
- Workshop or plant servicing;
- Handling, transport and storage of Hazardous Chemical Substance's;
- Vegetation management – Protected, clearing, aliens, felling;
- Access management – Roads, gates, crossings etc.;
- Fire plan;
- Waste management – transport, storage, segregation, classification, disposal (all waste streams);
- Social interaction – complaints management, compensation claims, access to properties etc.;
- Water – use (source, abstraction and disposal), access and all related information, crossings and mitigation;
- Emergency preparedness – Spills, training, other environmental emergencies;
- Dust and noise management methodologies;
- Fauna interaction and risk management – only if the risk was identified – wildlife interaction especially on game farms; and
- Heritage and palaeontology management.

The ECOs shall monitor and ensure that the contractors perform in accordance with these method statements. Completed and agreed method statements between the holder of the EA and the contractor shall be captured in Appendix 1.

4.6 Environmental Incident Log (Diary)

The ECOs are required to maintain an up-to-date and current Environmental Incident Log (environmental diary). The Environmental Incident Log is a means to record all environmental incidents and/or all non-compliance notice would not be issued. An environmental incident is defined as:

- Any deviation from the listed impact management actions (listed in this EMPr) that may be addressed immediately by the ECOs. (For example a contractor's staff member littering or a drip tray that has not been emptied);
- Any environmental impact resulting from an action or activity by a contractor in contravention of the environmental stipulations and guidelines listed in the EMPr which as a single event would have a minor impact but which if cumulative and continuous would have a significant effect (for example no toilet paper available in the ablutions for an afternoon); and
- General environmental information such as road kills or injured wildlife.

The ECOs are to record all environmental incidents in the Environmental Incident Log. All incidents regardless of severity must be reported to the Developer. The Log is to be kept in the EMPr file and at a minimum the following will be recorded for each environmental incident:

- The date and time of the incident;
- Description of the incident;
- The name of the Contractor responsible;
- The incident must be listed as significant or minor;
- If the incident is listed as significant, a non-compliance notice must be issued, and recorded in the log;
- Remedial or corrective action taken to mitigate the incident; and
- Record of repeat minor offences by the same contractor or staff member.

The Environmental Incident Log will be captured in the EAR.

4.7 Non-compliance

A non-compliance notice will be issued to the responsible contractor by the ECOs via the DSS or Project Manager. The non-compliance notice will be issued in writing; a copy filed in the EMPr file and will at a minimum include the following:

- Time and date of the non-compliance;
- Name of the contractor responsible;
- Nature and description of the non-compliance;
- Recommended / required corrective action; and
- Date by which the corrective action to be completed.
- The contractors shall act immediately when a notice of non-compliance is received and correct whatever is the cause for the issuing of the notice. Complaints received regarding activities on the development site pertaining to the environment shall be recorded in a dedicated register and the response noted with the date and action taken. The ECO should be made aware of any complaints. Any non-compliance with the agreed procedures of the EMPr is a transgression of the various statutes and laws that define the manner by which the environment is managed. Failure to redress the cause shall be reported to the relevant CA for them to deal with the transgression, as it deems fit. The contractor is deemed not to have complied with the EMPr if, inter alia, There is a deviation from the environmental conditions, impact management outcomes and impact management actions activities, as approved in generic and site specific EMPr as relevant as set out in the EMPr, which deviation has, or may cause, an environmental impact.

4.8 Corrective action records

For each non-compliance notice issued, a documented corrective action must be recorded. On receiving a non-compliance notice from the DSS, the contractor's cEO will ensure that the corrective actions required take place within the stipulated timeframe. On completion of the corrective action the cEO is to issue a Corrective Action Report in writing to the ECOs. If satisfied that the corrective action has been completed, the ECOs are to sign-off on the Corrective Action Report, and attach the report to the non-compliance notice in the EMPr file. A corrective action is considered complete once the report has signed off by the ECOs.

4.9 Photographic record

A digital photographic record will be kept. The photographic record will be used to show before, during and post rehabilitation evidence of the project as well used in cases of damages claims if they arise. Each image must be dated and a brief description note attached.

The Contractor shall:

1. Allow the ECOs access to take photographs of all areas, activities and actions.

The ECOs shall keep an electronic database of photographic records which will include:

1. Pictures of all areas designated as work areas, camp areas, development sites and storage areas taken before these areas are set up;
2. All bunding and fencing;
3. Road conditions and road verges;
4. Condition of all farm fences;
5. Topsoil storage areas;
6. All areas to be cordoned off during construction;
7. Waste management sites;
8. Ablution facilities (inside and out);
9. Any non-conformances deemed to be "significant";
10. All completed corrective actions for non-compliances;
11. All required signage;
12. Photographic recordings of incidents;
13. All areas before, during and post rehabilitation; and
14. Include relevant photographs in the Final Environmental Audit Report.

4.10 Complaints register

The ECOs shall keep a current and up-to-date complaints register. The complaints register is to be a record of all complaints received from communities, stakeholders and individuals. The Complaints Record shall:

1. Record the name and contact details of the complainant;
2. Record the time and date of the complaint;
3. Contain a detailed description of the complaint;
4. Where relevant and appropriate, contain photographic evidence of the complaint or damage (ECOs to take relevant photographs); and
5. Contain a copy of the ECOs written response to each complaint received and keep a record of any further correspondence with the complainant. The ECO's written response will include a description of any corrective action to be taken and must be

signed by the Contractor, ECO and affected party. Where a damage claim is issued by the complainant, the ECOs shall respond as described in (**section 4.11**) below.

4.11 Claims for damages

In the event that a Claim for Damages is submitted by a community, landowner or individual, the ECOs shall:

1. Record the full detail of the complaint as described in (**section 4.10**) above;
2. The DPM will evaluate the claim and associated damage and submit the evaluation to the Senior Site Representative for approval;
3. Following consideration by the DPM, the claim is to be resolved and settled immediately, or the reason for not accepting the claim communicated in writing to the claimant. Should the claimant not accept this, the ECO shall, in writing report the incident to the Developer's negotiator and legal department; and
4. A formal record of the response by the ECOs to the claimant as well as the rectification of the method of making payments not amount will be recorded in the EMPr file.

4.12 Interactions with affected parties

Open, transparent and good relations with affected landowners, communities and regional staff are an essential aspect to the successful management and mitigation of environmental impacts.

The ECOs shall:

1. Ensure that all queries, complaints and claims are dealt within an agreed timeframe;
2. Ensure that any or all agreements are documented, signed by all parties and a record of the agreement kept in the EMPr file;
3. Ensure that a complaints telephone numbers are made available to all landowners and affected parties; and
4. Ensure that contact with affected parties is courteous at all times;

4.13 Environmental audits

Internal environmental audits of the activity and implementation of the EMPr must be undertaken. The findings and outcomes included in the EMPr file and submitted to the CA at intervals as indicated in the EA.

The ECOs must prepare a monthly EAR. The report will be tabled as the key point on the agenda of the Environmental Site Meeting. The Report is submitted for acceptance at the meeting and the final report will be circulated to the Project Manager and filed in the EMPr file. At a frequency determined by the EA, the ECOs shall submit the monthly reports to the CA. At a minimum the monthly report is to cover the following:

- Weekly Environmental Checklists;
- Deviations and non-compliances with the checklists;
- Non-compliances issued;
- Completed and reported corrective actions;
- Environmental Monitoring;
- General environmental findings and actions; and

- Minutes of the Bi-monthly Environmental Site Meetings.

4.14 Final environmental audits

On final completion of the rehabilitation and/or requirements of the EA a final EAR is to be prepared and submitted to the CA. The EAR must comply with Appendix 7 of the EIA Regulations.

PART B: SECTION 1: Pre-approved generic EMPr template

5. IMPACT MANAGEMENT OUTCOMES AND IMPACT MANAGEMENT ACTIONS

This section provides a pre-approved generic EMPr template with aspects that are common to the development of substation infrastructure for the transmission and distribution of electricity. There is a list of aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity, and for each aspect a set of prescribed impact management outcomes and associated impact management actions have been identified. Holders of EAs are responsible to ensure the implementation of these outcomes and actions for all projects as a minimum requirement, in order to mitigate the impact of such aspects identified for the development or expansion of substation infrastructure for the transmission and distribution of electricity.

The template provided below is to be completed by providing the information under each heading for each environmental impact management action.

The completed template must be signed and dated on each page by both the contractor and the holder of the EA prior to commencement of the activity. The method statements prepared and agreed to by the holder of the EA must be appended to the template as Appendix 1. Each method statement must also be duly signed and dated on each page by

the contactor and the holder of the EA. This template, once signed and dated, is legally binding. The holder of the EA will remain responsible for its implementation.

5.1 Environmental awareness training

Impact management outcome: All onsite staff are aware and understands the individual responsibilities in terms of this EMPr.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All staff must receive environmental awareness training prior to commencement of the activities; – The Contractor must allow for sufficient sessions to train all personnel with no more than 20 personnel attending each course; – Refresher environmental awareness training is available as and when required; – All staff are aware of the conditions and controls linked to the EA and within the EMPr and made aware of their individual roles and responsibilities in achieving compliance with the EA and EMPr; – The Contractor must erect and maintain information posters at key locations on site, and the posters must include the following information as a minimum: a) Safety notifications; and b) No littering. – Environmental awareness training must include as a minimum the following: a) Description of significant environmental impacts, actual or potential, related to their work activities; b) Mitigation measures to be implemented when carrying out specific activities; c) Emergency preparedness and response procedures; d) Emergency procedures;						

e) Procedures to be followed when working near or within sensitive areas; f) Wastewater management procedures; g) Water usage and conservation; h) Solid waste management procedures; i) Sanitation procedures; j) Fire prevention; and k) Disease prevention. – A record of all environmental awareness training courses undertaken as part of the EMPr must be available; – Educate workers on the dangers of open and/or unattended fires; – A staff attendance register of all staff to have received environmental awareness training must be available. – Course material must be available and presented in appropriate languages that all staff can understand.						

5.2 Site Establishment development

Impact management outcome: Impacts on the environment are minimised during site establishment and the development footprint are kept to demarcated development area.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– A method statement must be provided by the contractor prior to any onsite activity that includes the layout of the construction camp in the form of a plan showing the location of key infrastructure and services (where applicable), including but not limited to offices, overnight vehicle parking areas, stores, the						

workshop, stockpile and lay down areas, hazardous materials storage areas (including fuels), the batching plant (if one is located at the construction camp), designated access routes, equipment cleaning areas and the placement of staff accommodation, cooking and ablution facilities, waste and wastewater management; – Location of camps must be within approved area to ensure that the site does not impact on sensitive areas identified in the environmental assessment or site walk through; – Sites must be located where possible on previously disturbed areas; – The camp must be fenced in accordance with ***Section 5.5: Fencing and gate installation***; and – The use of existing accommodation for contractor staff, where possible, is encouraged.						

5.3 Access restricted areas

Impact management outcome: Access to restricted areas prevented.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identification of access restricted areas is to be informed by the environmental assessment, site walk through and any additional areas identified during development; – Erect, demarcate and maintain a temporary barrier with clear signage around the perimeter of any access restricted area, colour coding could be used if appropriate; and						

– Unauthorised access and development related activity inside access restricted areas is prohibited.						

5.4 Access roads

Impact management outcome: Minimise impact to the environment through the planned and restricted movement of vehicles on site.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– An access agreement must be formalised and signed by the DPM, Contractor and landowner before commencing with the activities; – All private roads used for access to the servitude must be maintained and upon completion of the works, be left in at least the original condition – All contractors must be made aware of all these access routes. – Any access route deviation from that in the written agreement must be closed and re-vegetated immediately, at the contractor's expense; – Maximum use of both existing servitudes and existing roads must be made to minimize further disturbance through the development of new roads; – In circumstances where private roads must be used, the condition of the said roads must be recorded in accordance with ***section 4.9: photographic record***; prior to use and the condition thereof agreed by the landowner, the DPM, and the contractor;						

– Access roads in flattish areas must follow fence lines and tree belts to avoid fragmentation of vegetated areas or croplands – Access roads must only be developed on a pre-planned and approved roads.						

5.5 Fencing and Gate installation

Impact management outcome: Minimise impact to the environment and ensure safe and controlled access to the site through the erection of fencing and gates where required.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Use existing gates provided to gain access to all parts of the area authorised for development, where possible; – Existing and new gates to be recorded and documented in accordance with **section *4.9: photographic record***; – All gates must be fitted with locks and be kept locked at all times during the development phase, unless otherwise agreed with the landowner; – At points where the line crosses a fence in which there is no suitable gate within the extent of the line servitude, on the instruction of the DPM, a gate must be installed at the approval of the landowner; – Care must be taken that the gates must be so erected that there is a gap of no more than 100 mm between the bottom of the gate and the ground; – Where gates are installed in jackal proof fencing, a suitable reinforced concrete sill must be provided beneath the gate; – Original tension must be maintained in the fence wires;						

– All gates installed in electrified fencing must be re-electrified; – All demarcation fencing and barriers must be maintained in good working order for the duration of the development activities; – Fencing must be erected around the camp, batching plants, hazardous storage areas, and all designated access restricted areas, where applicable; – Any temporary fencing to restrict the movement of life-stock must only be erected with the permission of the land owner. – All fencing must be developed of high quality material bearing the SABS mark; – The use of razor wire as fencing must be avoided; – Fenced areas with gate access must remain locked after hours, during weekends and on holidays if staff is away from site. Site security will be required at all times; – On completion of the development phase all temporary fences are to be removed; – The contractor must ensure that all fence uprights are appropriately removed, ensuring that no uprights are cut at ground level but rather removed completely.						

5.6 Water Supply Management

Impact management outcome: Undertake responsible water usage**.**

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance

– All abstraction points or bore holes must be registered with the DWS and suitable water meters installed to ensure that the abstracted volumes are measured on a daily basis; – The Contractor must ensure the following: a. The vehicle abstracting water from a river does not enter or cross it and does not operate from within the river; b. No damage occurs to the river bed or banks and that the abstraction of water does not entail stream diversion activities; and c. All reasonable measures to limit pollution or sedimentation of the downstream watercourse are implemented. – Ensure water conservation is being practiced by: a. Minimising water use during cleaning of equipment; b. Undertaking regular audits of water systems; and c. Including a discussion on water usage and conservation during environmental awareness training. d. The use of grey water is encouraged.						

5.7 Storm and waste water management

Impact management outcome: Impacts to the environment caused by storm water and wastewater discharges during construction are avoided.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Runoff from the cement/ concrete batching areas must be strictly controlled, and contaminated water must be						

collected, stored and either treated or disposed of off-site, at a location approved by the project manager; – All spillage of oil onto concrete surfaces must be controlled by the use of an approved absorbent material and the used absorbent material disposed of at an appropriate waste disposal facility; – Natural storm water runoff not contaminated during the development and clean water can be discharged directly to watercourses and water bodies, subject to the Project Manager's approval and support by the ECO; – Water that has been contaminated with suspended solids, such as soils and silt, may be released into watercourses or water bodies only once all suspended solids have been removed from the water by settling out these solids in settlement ponds. The release of settled water back into the environment must be subject to the Project Manager's approval and support by the ECO.						

5.8 Solid and hazardous waste management

Impact management outcome: Wastes are appropriately stored, handled and safely disposed of at a recognised waste facility.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All measures regarding waste management must be undertaken using an integrated waste management approach; – Sufficient, covered waste collection bins (scavenger and weatherproof) must be provided;						

– A suitably positioned and clearly demarcated waste collection site must be identified and provided; – The waste collection site must be maintained in a clean and orderly manner; – Waste must be segregated into separate bins and clearly marked for each waste type for recycling and safe disposal; – Staff must be trained in waste segregation; – Bins must be emptied regularly; – General waste produced onsite must be disposed of at registered waste disposal sites/ recycling company; – Hazardous waste must be disposed of at a registered waste disposal site; – Certificates of safe disposal for general, hazardous and recycled waste must be maintained.						

5.9 Protection of watercourses and estuaries

Impact management outcome: Pollution and contamination of the watercourse environment and or estuary erosion are prevented.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All watercourses must be protected from direct or indirect spills of pollutants such as solid waste, sewage, cement, oils, fuels, chemicals, aggregate tailings, wash and contaminated water or organic material resulting from the Contractor's activities; – In the event of a spill, prompt action must be taken to clear the polluted or affected areas;						

– Where possible, no development equipment must traverse any seasonal or permanent wetland – No return flow into the estuaries must be allowed and no disturbance of the Estuarine functional Zone should occur; – Development of permanent watercourse or estuary crossing must only be undertaken where no alternative access to tower position is available; – There must not be any impact on the long term morphological dynamics of watercourses or estuaries; – Existing crossing points must be favored over the creation of new crossings (including temporary access) – When working in or near any watercourse or estuary, the following environmental controls and consideration must be taken: a) Water levels during the period of construction; No altering of the bed, banks, course or characteristics of a watercourse b) During the execution of the works, appropriate measures to prevent pollution and contamination of the riparian environment must be implemented e.g. including ensuring that construction equipment is well maintained; c) Where earthwork is being undertaken in close proximity to any watercourse, slopes must be stabilised using suitable materials, i.e. sandbags or geotextile fabric, to prevent sand and rock from entering the channel; and d) Appropriate rehabilitation and re-vegetation measures for the watercourse banks must be implemented timeously. In this regard, the banks should be appropriately and incrementally stabilised as soon as development allows.						

5.10 Vegetation clearing

Impact management outcome: Vegetation clearing is restricted to the authorised development footprint of the proposed infrastructure.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
General: – Indigenous vegetation which does not interfere with the development must be left undisturbed; – Protected or endangered species may occur on or near the development site. Special care should be taken not to damage such species; – Search, rescue and replanting of all protected and endangered species likely to be damaged during project development must be identified by the relevant specialist and completed prior to any development or clearing; – Permits for removal must be obtained from the relevant CA prior to the cutting or clearing of the affected species, and they must be filed; – The Environmental Audit Report must confirm that all identified species have been rescued and replanted and that the location of replanting is compliant with conditions of approvals; – Trees felled due to construction must be documented and form part of the Environmental Audit Report; – Rivers and watercourses must be kept clear of felled trees, vegetation cuttings and debris; – Only a registered pest control operator may apply herbicides on a commercial basis and commercial application must be carried out under the supervision of a registered pest control operator, supervision of a registered pest control operator or is appropriately trained;						

– A daily register must be kept of all relevant details of herbicide usage; – No herbicides must be used in estuaries; – All protected species and sensitive vegetation not removed must be clearly marked and such areas fenced off in accordance to ***Section 5.3: Access restricted areas***. Alien invasive vegetation must be removed and disposed of at a licensed waste management facility.						

5.11 Protection of fauna

Impact management outcome: Disturbance to fauna is minimised.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– No interference with livestock must occur without the landowner's written consent and with the landowner or a person representing the landowner being present; – The breeding sites of raptors and other wild birds species must be taken into consideration during the planning of the development programme; – Breeding sites must be kept intact and disturbance to breeding birds must be avoided. Special care must be taken where nestlings or fledglings are present; – Special recommendations of the avian specialist must be adhered to at all times to prevent unnecessary disturbance of birds;						

– No poaching must be tolerated under any circumstances. All animal dens in close proximity to the works areas must be marked as Access restricted areas; – No deliberate or intentional killing of fauna is allowed; – In areas where snakes are abundant, snake deterrents to be deployed on the pylons to prevent snakes climbing up, being electrocuted and causing power outages; and – No Threatened or Protected species (ToPs) and/or protected fauna as listed according NEMBA (Act No. 10 of 2004) and relevant provincial ordinances may be removed and/or relocated without appropriate authorisations/permits.						

5.12 Protection of heritage resources

Impact management outcome: Impact to heritage resources is minimised.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify, demarcate and prevent impact to all known sensitive heritage features on site in accordance with the No-Go procedure in ***Section 5.3: Access restricted areas***; – Carry out general monitoring of excavations for potential fossils, artefacts and material of heritage importance; – All work must cease immediately, if any human remains and/or other archaeological, palaeontological and historical material are uncovered. Such material, if exposed, must be reported to the nearest museum, archaeologist/ palaeontologist (or the South African Police Services), so that a systematic and professional investigation can be						

undertaken. Sufficient time must be allowed to remove/collect such material before development recommences.						

5.13 Safety of the public

Impact management outcome: All precautions are taken to minimise the risk of injury, harm or complaints.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Identify fire hazards, demarcate and restrict public access to these areas as well as notify the local authority of any potential threats e.g. large brush stockpiles, fuels etc.; – All unattended open excavations must be adequately fenced or demarcated; – Adequate protective measures must be implemented to prevent unauthorised access to and climbing of partly constructed towers and protective scaffolding; – Ensure structures vulnerable to high winds are secured; – Maintain an incidents and complaints register in which all incidents or complaints involving the public are logged.						

5.14 Sanitation

Impact management outcome: Clean and well maintained toilet facilities are available to all staff in an effort to minimise the risk of disease and impact to the environment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Mobile chemical toilets are installed onsite if no other ablution facilities are available; – The use of ablution facilities and or mobile toilets must be used at all times and no indiscriminate use of the veld for the purposes of ablutions must be permitted under any circumstances; – Where mobile chemical toilets are required, the following must be ensured: a) Toilets are located no closer than 100 m to any watercourse or water body; b) Toilets are secured to the ground to prevent them from toppling due to wind or any other cause; c) No spillage occurs when the toilets are cleaned or emptied and the contents are managed in accordance with the EMPr; d) Toilets have an external closing mechanism and are closed and secured from the outside when not in use to prevent toilet paper from being blown out; e) Toilets are emptied before long weekends and workers holidays, and must be locked after working hours; f) Toilets are serviced regularly and the ECO must inspect toilets to ensure compliance to health standards; – A copy of the waste disposal certificates must be maintained.						

5.15 Prevention of disease

Impact Management outcome: All necessary precautions linked to the spread of disease are taken.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Undertake environmentally-friendly pest control in the camp area; – Ensure that the workforce is sensitised to the effects of sexually transmitted diseases, especially HIV AIDS; – The Contractor must ensure that information posters on AIDS are displayed in the Contractor Camp area; – Information and education relating to sexually transmitted diseases to be made available to both construction workers and local community, where applicable; – Free condoms must be made available to all staff on site at central points; – Medical support must be made available; – Provide access to Voluntary HIV Testing and Counselling Services.						

5.16 Emergency procedures

Impact management outcome: Emergency procedures are in place to enable a rapid and effective response to all types of environmental emergencies.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Compile an Emergency Response Action Plan (ERAP) prior to the commencement of the proposed project; – The Emergency Plan must deal with accidents, potential spillages and fires in line with relevant legislation;						

– All staff must be made aware of emergency procedures as part of environmental awareness training; – The relevant local authority must be made aware of a fire as soon as it starts; – In the event of emergency necessary mitigation measures to contain the spill or leak must be implemented (see ***Hazardous Substances section 5.17***).						

5.17 Hazardous substances

Impact management outcome: Safe storage, handling, use and disposal of hazardous substances.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The use and storage of hazardous substances to be minimised and non-hazardous and non-toxic alternatives substituted where possible; – All hazardous substances must be stored in suitable containers as defined in the Method Statement; – Containers must be clearly marked to indicate contents, quantities and safety requirements; – All storage areas must be bunded. The bunded area must be of sufficient capacity to contain a spill / leak from the stored containers; – Bunded areas to be suitably lined with a SABS approved liner; – An Alphabetical Hazardous Chemical Substance (HCS) control sheet must be drawn up and kept up to date on a continuous basis; – All hazardous chemicals that will be used on site must have Material Safety Data Sheets (MSDS);						

– All employees working with HCS must be trained in the safe use of the substance and according to the safety data sheet; – Employees handling hazardous substances / materials must be aware of the potential impacts and follow appropriate safety measures. Appropriate personal protective equipment must be made available; – The Contractor must ensure that diesel and other liquid fuel, oil and hydraulic fluid is stored in appropriate storage tanks or in bowsers; – The tanks/ bowsers must be situated on a smooth impermeable surface (concrete) with a permanent bund. The impermeable lining must extend to the crest of the bund and the volume inside the bund must be 130% of the total capacity of all the storage tanks/ bowsers (110% statutory requirement plus an allowance for rainfall); – The floor of the bund must be sloped, draining to an oil separator; – Provision must be made for refueling at the storage area by protecting the soil with an impermeable groundcover. Where dispensing equipment is used, a drip tray must be used to ensure small spills are contained; – All empty externally dirty drums must be stored on a drip tray or within a bunded area; – No unauthorised access into the hazardous substances storage areas must be permitted; – No smoking must be allowed within the vicinity of the hazardous storage areas; – Adequate fire-fighting equipment must be made available at all hazardous storage areas; – Where refueling away from the dedicated refueling station is required, a mobile refueling unit must be used. Appropriate ground protection such as drip trays must be used;						

– An appropriately sized spill kit kept onsite relevant to the scale of the activity/s involving the use of hazardous substance must be available at all times; – The responsible operator must have the required training to make use of the spill kit in emergency situations; – An appropriate number of spill kits must be available and must be located in all areas where activities are being undertaken; – In the event of a spill, contaminated soil must be collected in containers and stored in a central location and disposed of according to the National Environmental Management: Waste Act 59 of 2008. Refer to ***Section 5.7*** for procedures concerning ***storm and waste water management*** and ***5.8*** for ***solid and hazardous waste management.***						

5.18 Workshop, equipment maintenance and storage

Impact management outcome: Soil, surface water and groundwater contamination is minimised.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where possible and practical all maintenance of vehicles and equipment must take place in the workshop area; – During servicing of vehicles or equipment, especially where emergency repairs are effected outside the workshop area, a suitable drip tray must be used to prevent spills onto the soil. The relevant local authority must be made aware of a fire as soon as it starts; – Leaking equipment must be repaired immediately or be removed from site to facilitate repair; – Workshop areas must be monitored for oil and fuel spills;						

– Appropriately sized spill kit kept onsite relevant to the scale of the activity taking place must be available; – The workshop area must have a bunded concrete slab that is sloped to facilitate runoff into a collection sump or suitable oil / water separator where maintenance work on vehicles and equipment can be performed; – Water drainage from the workshop must be contained and managed in accordance Section ***5.7: Storm and waste water management***.						

5.19 Batching plants

Impact management outcome: Minimise spillages and contamination of soil, surface water and groundwater**.**

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Concrete mixing must be carried out on an impermeable surface; – Batching plants areas must be fitted with a containment facility for the collection of cement laden water. – Dirty water from the batching plant must be contained to prevent soil and groundwater contamination – Bagged cement must be stored in an appropriate facility and at least 10 m away from any water courses, gullies and drains; – A washout facility must be provided for washing of concrete associated equipment. Water used for washing must be restricted;						

– Hardened concrete from the washout facility or concrete mixer can either be reused or disposed of at an appropriate licenced disposal facility; – Empty cement bags must be secured with adequate binding material if these will be temporarily stored on site; – Sand and aggregates containing cement must be kept damp to prevent the generation of dust (Refer to ***Section 5.20: Dust emissions***) – Any excess sand, stone and cement must be removed or reused from site on completion of construction period and disposed at a registered disposal facility; – Temporary fencing must be erected around batching plants in accordance with Section ***5.5: Fencing and gate installation***.						

5.20 Dust emissions

Impact management outcome: Dust prevention measures are applied to minimise the generation of dust.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Take all reasonable measures to minimise the generation of dust as a result of project development activities to the satisfaction of the ECO; – Removal of vegetation must be avoided until such time as soil stripping is required and similarly exposed surfaces must be re-vegetated or stabilised as soon as is practically possible; – Excavation, handling and transport of erodible materials must be avoided under high wind conditions or when a visible dust plume is present;						

– During high wind conditions, the ECO must evaluate the situation and make recommendations as to whether dust-damping measures are adequate, or whether working will cease altogether until the wind speed drops to an acceptable level; – Where possible, soil stockpiles must be located in sheltered areas where they are not exposed to the erosive effects of the wind; – Where erosion of stockpiles becomes a problem, erosion control measures must be implemented at the discretion of the ECO; – Vehicle speeds must not exceed 40 km/h along dust roads or 20 km/h when traversing unconsolidated and non-vegetated areas; – Straw stabilisation must be applied at a rate of one bale/10 m² and harrowed into the top 100 mm of top material, for all completed earthworks; – For significant areas of excavation or exposed ground, dust suppression measures must be used to minimise the spread of dust.						

5.21 Blasting

Impact management outcome: Impact to the environment is minimised through a safe blasting practice.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Any blasting activity must be conducted by a suitably licensed blasting contractor; and						

– Notification of surrounding landowners, emergency services site personnel of blasting activity 24 hours prior to such activity taking place on Site.						

5.22 Noise

Impact Management outcome: Prevent unnecessary noise to the environment by ensuring that noise from development activity is mitigated.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– The Contractor must keep noise level within acceptable limits, Restrict the use of sound amplification equipment for communication and emergency only; – All vehicles and machinery must be fitted with appropriate silencing technology and must be properly maintained; – Any complaints received by the Contractor regarding noise must be recorded and communicated. Where possible or applicable, provide transport to and from the site on a daily basis for construction workers; – Develop a Code of Conduct for the construction phase in terms of behaviour of construction staff. Operating hours as determined by the environmental authorisation are adhered to during the development phase. Where not defined, it must be ensured that development activities must still meet the impact management outcome related to noise management.						

5.23 Fire prevention

Impact management outcome: Prevention of uncontrollable fires.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Designate smoking areas where the fire hazard could be regarded as insignificant; – Firefighting equipment must be available on all vehicles located on site; – The local Fire Protection Agency (FPA) must be informed of construction activities; – Contact numbers for the FPA and emergency services must be communicated in environmental awareness training and displayed at a central location on site; – Two way swop of contact details between ECO and FPA.						

5.24 Stockpiling and stockpile areas

Impact management outcome: Reduce erosion and sedimentation as a result of stockpiling.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All material that is excavated during the project development phase (either during piling (if required) or earthworks) must be stored appropriately on site in order to minimise impacts to watercourses, watercourses and water bodies; – All stockpiled material must be maintained and kept clear of weeds and alien vegetation growth by undertaking regular weeding and control methods; – Topsoil stockpiles must not exceed 2 m in height;						

– During periods of strong winds and heavy rain, the stockpiles must be covered with appropriate material (e.g. cloth, tarpaulin etc.); – Where possible, sandbags (or similar) must be placed at the bases of the stockpiled material in order to prevent erosion of the material.						

5.25 Civil works

Impact management outcome: Impact to the environment minimised during civil works to create the substation terrace.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Where terracing is required, topsoil must be collected and retained for the purpose of re-use later to rehabilitate disturbed areas not covered by yard stone; – Areas to be rehabilitated include terrace embankments and areas outside the high voltage yards; – Where required, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – These areas can be stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Rehabilitation of the disturbed areas must be managed in accordance with ***Section 5.35: Landscaping and rehabilitation***;						

– All excess spoil generated during terracing activities must be disposed of in an appropriate manner and at a recognised landfill site; and – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes.						

5.26 Excavation of foundation, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs as a result of excavation of foundation, cable trenching and drainage systems.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All excess spoil generated during foundation excavation must be disposed of in an appropriate manner and at a licensed landfill site, if not used for backfilling purposes; – Spoil can however be used for landscaping purposes and must be covered with a layer of 150 mm topsoil for rehabilitation purposes; – Management of equipment for excavation purposes must be undertaken in accordance with ***Section 5.18: Workshop, equipment maintenance and storage***; and – Hazardous substances spills from equipment must be managed in accordance with ***Section 5.17: Hazardous substances***.						

5.27 Installation of foundations, cable trenching and drainage systems

Impact management outcome: No environmental degradation occurs during the installation of foundation, cable trenching and drainage system.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Batching of cement to be undertaken in accordance with **Section *5.19: Batching plants***; and – Residual solid waste must be disposed of in accordance with **Section *5.8: Solid waste and hazardous management***.						

5.28 Installation of equipment (circuit breakers, current Transformers, Isolators, Insulators, surge arresters, voltage transformers, earth switches)

Impact management outcome: No environmental degradation occurs as a result of installation of equipment.

Impact Management Actions	Implementation			Monitoring		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Management of dust must be conducted in accordance with Section ***5. 20: Dust emissions***; – Management of equipment used for installation must be conducted in accordance with Section ***5.18: Workshop, equipment maintenance and storage***; – Management hazardous substances and any associated spills must be conducted in accordance with Section ***5.17: Hazardous substances***; and – Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.29 Steelwork Assembly and Erection

Impact management outcome: No environmental degradation occurs as a result of steelwork assembly and erection.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– During assembly, care must be taken to ensure that no wasted/unused materials are left on site e.g. bolts and nuts – Emergency repairs due to breakages of equipment must be managed in accordance with ***Section 5. 18: Workshop, equipment maintenance and storage*** and ***Section 5.16: Emergency procedures***.						

5.30 Cabling and Stringing

Impact management outcome: No environmental degradation occurs as a result of stringing.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Residual solid waste (off cuts etc.) shall be recycled or disposed of in accordance with **Section 6.8: *Solid waste and hazardous Management***; – Management of equipment used for installation shall be conducted in accordance with **Section *5.18: Workshop, equipment maintenance and storage***;						

– Management hazardous substances and any associated spills shall be conducted in accordance with ***Section 5.17: Hazardous substances***.						

5.31 Testing and Commissioning (all equipment testing, earthing system, system integration)

Impact management outcome: No environmental degradation occurs as a result of Testing and Commissioning.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Residual solid waste must be recycled or disposed of in accordance with ***Section 5.8: Solid waste and hazardous management***.						

5.32 Socio-economic

Impact management outcome: enhanced socio-economic development.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Develop and implement communication strategies to facilitate public participation; – Develop and implement a collaborative and constructive approach to conflict resolution as part of the external stakeholder engagement process;						

– Sustain continuous communication and liaison with neighboring owners and residents – Create work and training opportunities for local stakeholders; and – Where feasible, no workers, with the exception of security personnel, must be permitted to stay over-night on the site. This would reduce the risk to local farmers.						

5.33 Temporary closure of site

Impact management outcome: Minimise the risk of environmental impact during periods of site closure greater than five days.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– Bunds must be emptied (where applicable) and need to be undertaken in accordance with the impact management actions included in ***sections 5.17: Hazardous substances and 5.18: Workshop, equipment maintenance and storage***; – Hazardous storage areas must be well ventilated; – Fire extinguishers must be serviced and accessible. Service records to be filed and audited at last service; – Emergency and contact details displayed must be displayed; – Security personnel must be briefed and have the facilities to contact or be contacted by relevant management and emergency personnel; – Night hazards such as reflectors, lighting, traffic signage etc. must have been checked;						

– Fire hazards identified and the local authority must have been notified of any potential threats e.g. large brush stockpiles, fuels etc.; – Structures vulnerable to high winds must be secured; – Wind and dust mitigation must be implemented; – Cement and materials stores must have been secured; – Toilets must have been emptied and secured; – Refuse bins must have been emptied and secured; – Drip trays must have been emptied and secured.						

5.34 Dismantling of old equipment

Impact management outcome: Impact to the environment to be minimised during the dismantling, storage and disposal of old equipment commissioning.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All old equipment removed during the project must be stored in such a way as to prevent pollution of the environment; – Oil containing equipment must be stored to prevent leaking or be stored on drip trays; – All scrap steel must be stacked neatly and any disused and broken insulators must be stored in containers; – Once material has been scrapped and the contract has been placed for removal, the disposal Contractor must ensure that any equipment containing pollution causing substances is dismantled and transported in such a way as to prevent spillage and pollution of the environment; – The Contractor must also be equipped to contain and clean up any pollution causing spills; and						

– Disposal of unusable material must be at a licensed waste disposal site.						

5.35 Landscaping and rehabilitation

Impact management outcome: Areas disturbed during the development phase are returned to a state that approximates the original condition.

Impact Management Actions	**Implementation**			**Monitoring**		
	Responsible person	Method of implementation	Timeframe for implementation	Responsible person	Frequency	Evidence of compliance
– All areas disturbed by construction activities must be subject to landscaping and rehabilitation; All spoil and waste must be disposed of to a registered waste site; – All slopes must be assessed for contouring, and to contour only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983 – All slopes must be assessed for terracing, and to terrace only when the need is identified in accordance with the Conservation of Agricultural Resources Act, No 43 of 1983; – Berms that have been created must have a slope of 1:4 and be replanted with indigenous species and grasses that approximates the original condition; – Where new access roads have crossed cultivated farmlands, that lands must be rehabilitated by ripping which must be agreed to by the holder of the EA and the landowners; – Rehabilitation of access roads outside of farmland; – Indigenous species must be used for with species and/grasses to where it compliments or approximates the original condition;						

– Stockpiled topsoil must be used for rehabilitation (refer to ***Section 5.24: Stockpiling and stockpiled areas***); – Stockpiled topsoil must be evenly spread so as to facilitate seeding and minimise loss of soil due to erosion; – Before placing topsoil, all visible weeds from the placement area and from the topsoil must be removed; – Subsoil must be ripped before topsoil is placed; – The rehabilitation must be timed so that rehabilitation can take place at the optimal time for vegetation establishment; – Where impacted through construction related activity, all sloped areas must be stabilised to ensure proper rehabilitation is effected and erosion is controlled; – Sloped areas stabilised using design structures or vegetation as specified in the design to prevent erosion of embankments. The contract design specifications must be adhered to and implemented strictly; – Spoil can be used for backfilling or landscaping as long as it is covered by a minimum of 150 mm of topsoil. – Where required, re-vegetation including hydro-seeding can be enhanced using a vegetation seed mixture as described below. A mixture of seed can be used provided the mixture is carefully selected to ensure the following: a) Annual and perennial plants are chosen; b) Pioneer species are included; c) Species chosen must be indigenous to the area with the seeds used coming from the area; d) Root systems must have a binding effect on the soil; e) The final product must not cause an ecological imbalance in the area						

6 ACCESS TO THE GENERIC EMPr

Once completed and signed, to allow the public access to the generic EMPr, the holder of the EA must make the EMPr available to the public in accordance with the requirements of Regulation 26(h) of the EIA Regulations.

PART B: SECTION 2

7 SITE SPECIFIC INFORMATION AND DECLARATION

7.1 Sub-section 1: contact details and description of the project

7.1.1 Details of the applicant:

Phefumula Emoyeni One (Pty) Ltd is the project proponent (Applicant) with regards to this application for the construction and operation of the Phefumula Emoyeni One Wind Energy Facility (WEF) and associated infrastructure

PROPONENT:	**PHEFUMULA EMOYENI ONE (PTY) LTD**
Contact Person:	Peter Carl Venn
Postal Address	PO Box 639, Northlands, Johannesburg, Gauteng, 2116
Telephone:	+27 83 689 3063
Email:	peter.venn@seritigreen.com

Refer to Section 2 of the EMPr for the detailed project description r

7.1.2 Details and expertise of the EAP:

WSP was appointed in the role of Independent EAP to undertake the registration process for the proposed project.

EAP	**WSP GROUP AFRICA (PTY) LTD**
Contact Person:	Ashlea Strong
Physical Address:	Building C, Knightsbridge, 33 Sloane Street, Bryanston, Johannesburg
Postal Address:	P.O. Box 98867, Sloane Park 2151, Johannesburg
Telephone:	011 361 1392
Fax:	011 361 1301
Email:	Ashlea.Strong@wsp.com

EAP 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)

Refer to Section 1.2 of the EMPr

7.1.3 Project name:

Proposed Phefumula Emoyeni One Wind Energy Facility (WEF) and its associated infrastructure, located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province

7.1.4 Description of the project:

Refer to Section 2 of the EMPr

The proposed Phefumula Emoyeni One WEF will have a project area of approximately 33 660 hectares (ha). Within this project area the extent of the buildable area will be subject to finalization based on technical and environmental requirements.

The proposed Phefumula Emoyeni One WEF is located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa.

The following are proposed as part of the project. The total project area is 33 660 ha. The project footprint will contain the following:

WIND TURBINES

- Up to 88 turbines (Between 6MW and 15MW each), Each turbine will have a foundation of approximately up to 40m2 – excavation up to 6m deep, constructed of reinforced concrete to support the mounting ring. Once tower established, footprint of foundation is covered with soil;
- Turbine hub height of up to 200m;
- Rotor diameter up to 200m; and
- Permanent hard standing area for each wind turbine (approximately 75m x120m).

IPP ONSITE SUBSTATION AND BESS

- Each IPP onsite Substation and BESS will have a total footprint of up to 10ha in extent.
- Each 33kV/132kV onsite collector substation (IPP portion) will have a footprint of approximately 5ha.
- The substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc.
- Each BESS will have a footprint of approximately 5ha
- Export Capacity of up to 200MWh
- Total storage capacity 800MW
- Storage capacity of up to 6-8 hours

- The BESS will be housed in containers.
- Battery types to be considered: Solid State Batteries as the preferred (Lithium Ion) and Redox Flow Batteries as the alternative (Vanadium Redox).

OPERATION AND MAINTENANCE BUILDING INFRASTRUCTURE

- O&M building infrastructure will be required to support the functioning of the WEF and for services required by operations and maintenance staff. The O&M building infrastructure will be near the onsite substation and will include 3 O&M offices of approximately 1.5ha each adjacent to each collector Substation.
- Each O&M Building will include:
- Operations Building;
- Workshop and Stores Area
- Refuse area for temporary storage of waste; and
- Conservancy tank to service the ablution facilities.

CONSTRUCTION CAMP LAYDOWN

- Each Construction Camp Laydown Area will include:
- Temporary laydown or staging area -Typical area of 3ha each (150m x 200m).
- Laydown area could increase to 30ha for concrete towers, should they be required.
- Sewage: septic and/or conservancy tanks and portable toilets.
- Temporary concrete batching plant & yard of approximately 7ha, comprising amongst others, a concrete storage area, batching plant, electrical infrastructure and substation, generators and fuel stores, gantries and loading facilities, offices, material stores (rebar, concrete, aggregate and associated materials), mess rooms, workshops, laydown and storage areas, sewage and toilet facilities, offices and boardrooms, labour mess and changerooms, mixers, , water and settling tanks, pumps, silos and hoppers, a laboratory, parking areas, internal and access roads - Gravel and sand will be stored in separate heaps whilst the cement will be contained in a silo. The maximum height of the silo will be 20m.

INTERNAL ROAD

- The Project site can be accessed easily via the N11 national road which run along the eastern boundaries of the site.
- There are existing roads that go through the land parcels to allow for direct access to the project development area.
- Internal and access roads with a width of between 8m and 10m, which can be increased to approximately 12m on bends. The roads will be positioned within a 20m wide corridor to accommodate cable trenches, stormwater channels and bypass /circles of up to 20m during construction. Length of the internal roads will be approximately 60km.

ASSOCIATED INFRASTRUCTURE

- 33kV cabling to connect the wind turbines to the onsite collector substations, to be laid underground where practical.
- Cabling between turbines, to be laid underground where practical.
- Laydown and crane hardstand areas (approximately 75m x 120m)..

7.1.5 Project location:

The proposed Phefumula Emoyeni One WEF is located approximately 16km north of Ermelo in the Msukaligwa Local Municipality and Gert Sibande District Municipality, in the Mpumalanga Province of South Africa.

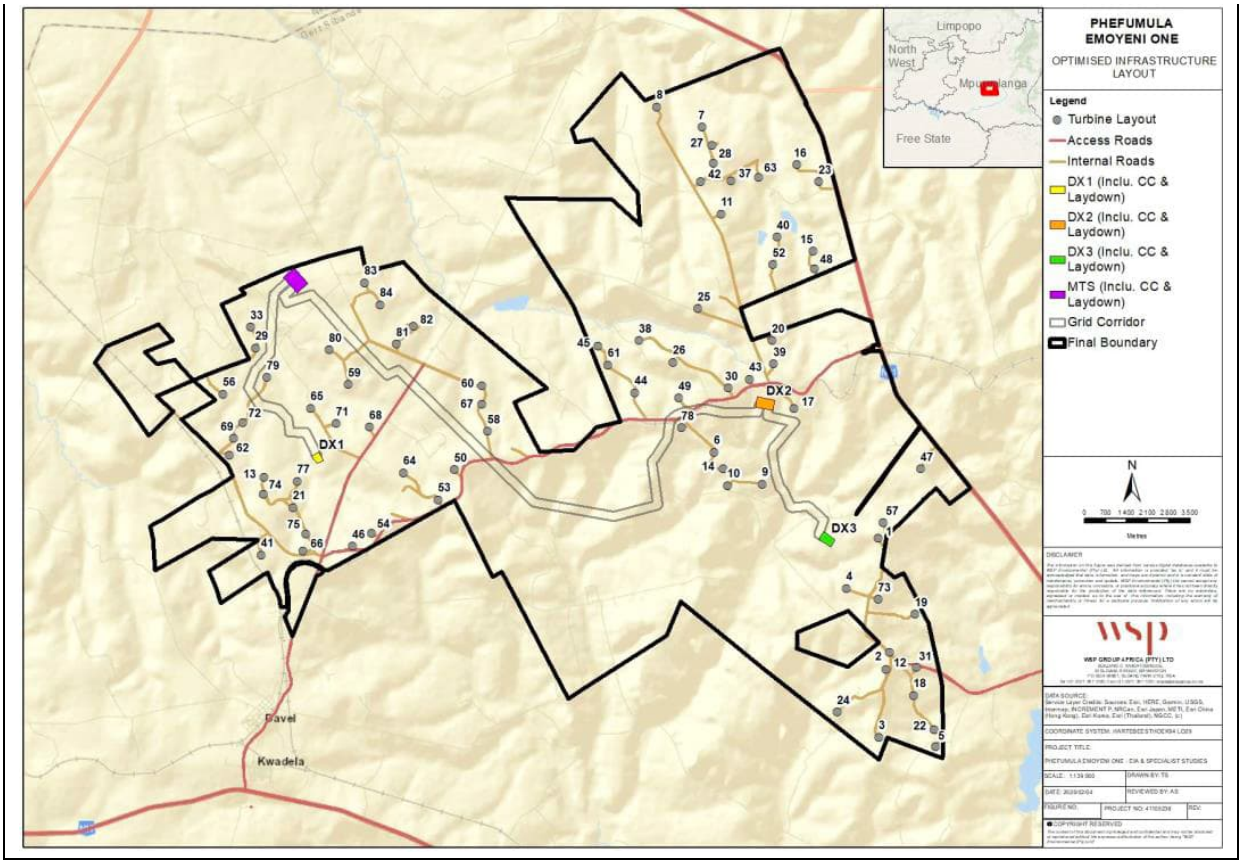
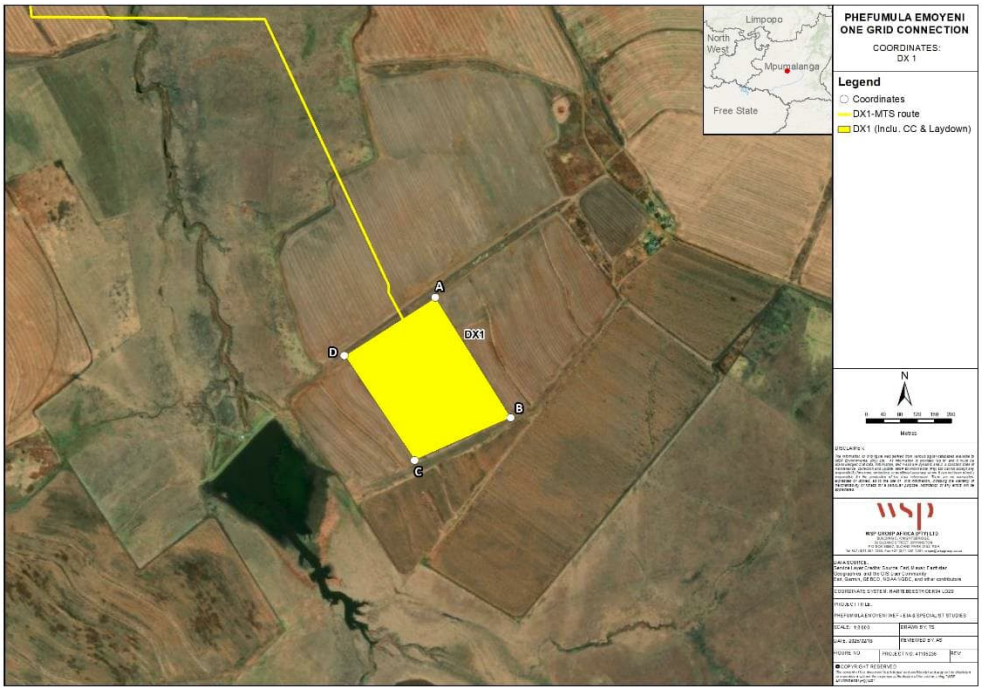


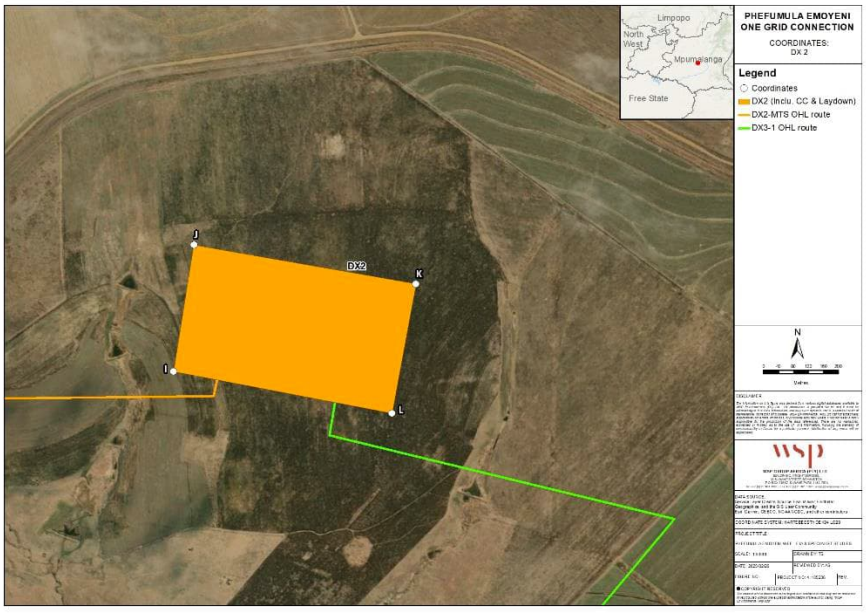
Figure 1: Locality map for the proposed Phefumula Emoyeni WEF and associated infrastructure

The **Coordinates for the proposed substations are below:**

Co-ordinate Points of the DX1 Substation (inclusive of IPP Substation, Laydown Area and Construction Camp)

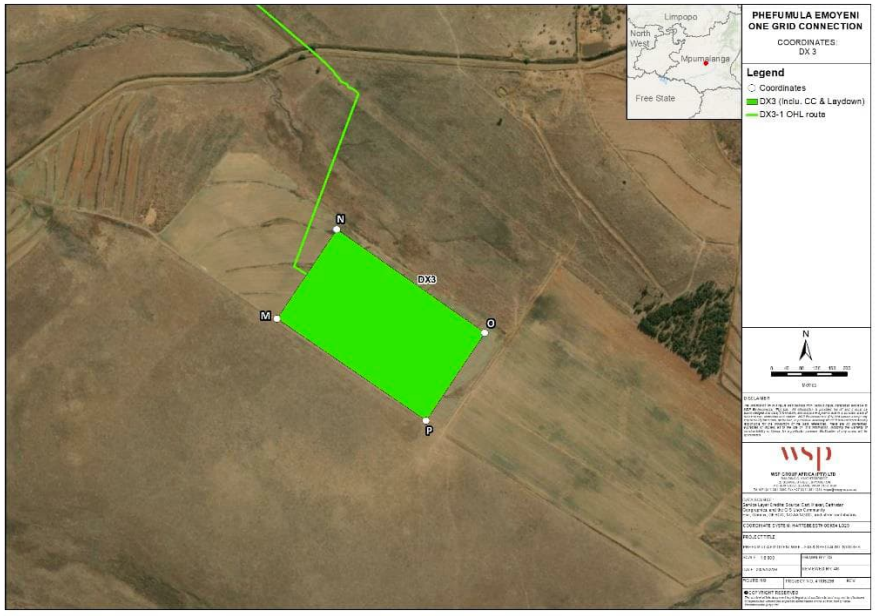
Point	Longitude	Latitude
		
A	29° 40' 59.138" E	26° 22' 3.091" S
B	29° 41' 5.570" E	26° 22' 12.267" S
C	29° 40' 57.447" E	26° 22' 15.561" S
D	29° 40' 51.419" E	26° 22' 7.555" S

Co-ordinate Points of the DX2 Substation (inclusive of IPP Substation, Laydown Area and Construction Camp)

Point	Longitude	Latitude
		

Point	Longitude	Latitude
I	29° 49' 42.183" E	26° 21' 15.194" S
J	29° 49' 44.064" E	26° 21' 4.175" S
K	29° 50' 5.482" E	26° 21' 7.446" S
L	29° 50' 3.254" E	26° 21' 18.688" S

Co-ordinate Points of DX3 (inclusive of IPP Substation, Laydown Area and Construction Camp)

Point	Longitude	Latitude
		
M	29° 50' 58.578" E	26° 23' 32.594" S
N	29° 51' 4.239" E	26° 23' 24.870" S
O	29° 51' 18.456" E	26° 23' 33.720" S
P	29° 51' 12.902" E	26° 23' 41.303" S

7.16 Preliminary technical specification of the overhead transmission and distribution:

Refer to Section 2 of the EMPr

Each IPP onsite Substation and BESS will have a total footprint of up to 10ha in extent.

Each 33kV/132kV onsite collector substation (IPP portion) will have a footprint of approximately 5ha.

The substation will consist of a high voltage substation yard to allow for multiple 132kV feeder bays and transformers, control building, telecommunication infrastructure, access road, etc

7.2 Sub-section 2: Development footprint site map

This sub-section must include a map of the site sensitivity overlaid with the preliminary infrastructure layout. The sensitivity map must be prepared from the national web based environmental screening tool, when available for compulsory use at: https://screening.environment.gov.za/screeningtool. The sensitivity map shall identify the nature of each sensitive feature e.g. threatened plant species, archaeological site, etc. Sensitivity maps shall identify features both within the planned working area and any known sensitive features within 50 m from the development footprint.

Refer to Section 3 of the EMPr

A summary of the DFFE screening tool, the applicable legislation as well as the specialist sensitivity verification are detailed in the table below.

Assessment Protocols and Site Sensitivity Verification Summary

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification	Motivation for Exclusion
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	Very High Sensitivity	Confirmed High and Medium Sensitivity	N/A
Landscape/Visual Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Very High Sensitivity	Confirmed moderate to high Sensitivity	N/A
Archaeological and Cultural Heritage Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	High Sensitivity	Confirmed low, medium and high Sensitivity	N/A
Palaeontology Impact Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Very High Sensitivity	Confirmed low sensitivity	N/A

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification	Motivation for Exclusion
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/High in areas of primary grassland and wetland habitat and areas designated as CBA Irreplaceable and CBA Optimal. Low/ Medium in areas of secondary grassland habitat. Very Low in areas of modified habitat.	N/A
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	N/A
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	A formal Civil Aviation Assessment will not be undertaken as part of the S&EIA Process. Nevertheless, the relevant Authorities have been included on the project stakeholder database. As of the 1st of February 2022, ATNS has been appointed as the new Obstacle application Service Provider for Solar Plants. Their responsibility would pertain to the assessments, maintenance, and all other related matters in respect to Solar assessments. A wind turbine Obstacles application has been submitted to ATNS for the project and the required permits will be obtained prior to the development of the project. The South African Civil Aviation Authority (SACAA) has been

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification	Motivation for Exclusion
				included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought. This theme has been identified as a high sensitivity, and a compliance statement has been undertaken by the EAP.
Defence Assessment	Protocol For The Specialist Assessment And Minimum Report Content Requirements For Environmental Impacts On Defence installations	Low Sensitivity	Confirmed Low Sensitivity	The Department of Defence has been included on the project stakeholder database. They will be informed of the proposed Project, and comment will be sought. As this theme has been identified as a low sensitivity, no compliance statement is required.
RFI Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Very High Sensitivity	Confirmed Low Sensitivity	An RFI Study will not be undertaken. The SAWS and relevant telecommunications stakeholders will be engaged with as part of the Public Participation Process. This theme has been identified as a very high sensitivity, and a compliance statement has been made by the EAP.
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	A detailed Geotechnical Assessment will not be undertaken as this will be undertaken during the design phase.

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification	Motivation for Exclusion
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	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 primary grassland and wetland habitat.	N/A
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 grassland and wetland habitat.	N/A
Bat assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Bats	High Sensitivity	Confirmed High Sensitivity	N/A
Avifauna Assessment	Site Sensitivity Verification Requirements where a specialist Assessment is required but no Specific Assessment Protocol has been prescribed	Low Sensitivity	Confirmed High Sensitivity	N/A
Vulture Species theme	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Bats	Medium Sensitivity	Confirmed Low Sensitivity	N/A
Flicker Assessment	Protocol for the Specialist Assessment and Minimum Report Content Requirements for Environmental Impacts on Flicker installations	Very high Sensitivity	Confirmed High Sensitivity	N/A
Noise Assessment	Protocol for the Specialist Assessment and	Very high Sensitivity	Confirmed Very High Sensitivity	N/A

Specialist Assessment	Assessment Protocol	DFFE Screening Tool Sensitivity	Specialist Sensitivity Verification	Motivation for Exclusion
	Minimum Report Content Requirements for Environmental Impacts on Noise impacts			

7.3 Sub-section 3: Declaration

The proponent/applicant or holder of the EA affirms that he/she will abide and comply with the prescribed impact management outcomes and impact management actions as stipulated in part B: section 1 of the generic EMPr and have the understanding that the impact management outcomes and impact management actions are legally binding. The proponent/applicant or holder of the EA affirms that he/she will provide written notice to the CA 14 day prior to the date on which the activity will commence of commencement of construction to facilitate compliance inspections.

Signature Proponent/applicant/ holder of EA Date:

TO BE SIGNED IN FINAL REPORT

7.4 Sub-section 4: amendments to site specific information (Part B; section 2)

Should the EA be transferred to a new holder, Part B: Section 2 must be completed by the new holder and submitted with the application for an amendment of the EA in terms of Regulations 29 or 31 of the EIA Regulations, whichever applies. The information submitted for an amendment to an environmental authorisation will be considered to be incomplete should a signed copy of Part B: Section 2 not be submitted. Once approved, Part B: Section 2 forms part of the EMPr for the development and the EMPr becomes legally binding to the new EA holder.

PART C

8 SITE SPECIFIC ENVIRONMENTAL ATTRIBUTES

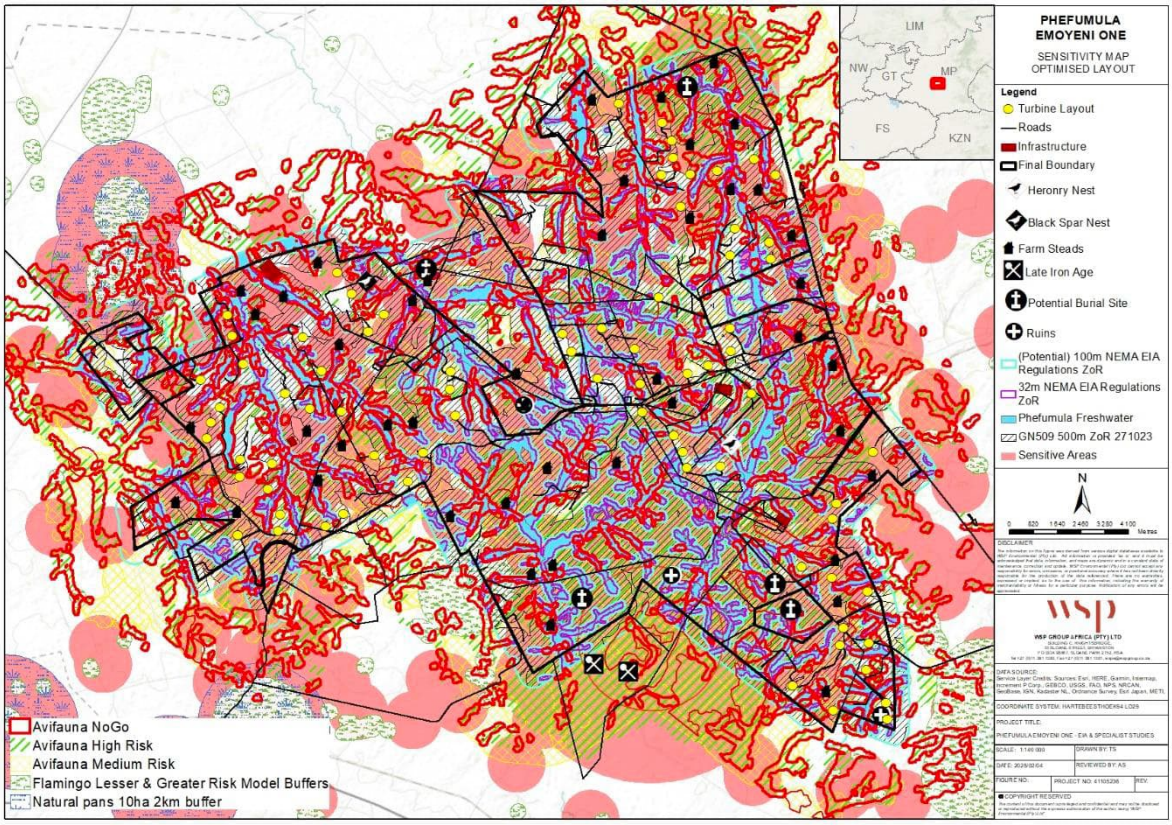
If any specific environmental sensitivities/attributes are present on the site which require more specific impact management outcomes and actions, not included in the pre-approved generic EMPr template, to manage impacts, those impact management outcomes and impact management actions must be included in this section. These specific management controls must be referenced spatially, and must include impact management outcomes and impact management actions. The management controls including impact management outcomes and impact management actions must be presented in the format of the pre-approved generic EMPr template. This applies only to additional impact management outcomes and impact management actions that are necessary.

If Part C is applicable to the development as authorised in the EA, it is required to be submitted to the CA together with the BAR or EIAR, for consideration of, and decision on, the application for EA. The information in this section must be prepared by an EAP and the name and expertise of the EAP, including the curriculum vitae are to be included. Once approved, Part C forms part of the EMPr for the site and is legally binding.

This section will **not be required** should the site contain no specific environmental sensitivities or attributes.

The site specific mitigation measures for the specific environmental sensitivities and attributes are included in Section 7 of the Site Specific EMPr.

The following figure includes the consolidated sensitivity map overlain by the Optimised Layout.



APPENDIX 1: METHOD STATEMENTS

To be prepared by the contractor prior to commencement of the activity. The method statements are **not required** to be submitted to the CA.

Appendix F

GRAVE MANAGEMENT PLAN

Public

HERITAGE SITE MANAGEMENT PLAN (HSMP) FOR CEMETERIES IDENTIFIED AT THE PHEFUMULA EMOYENI ONE WIND ENERGY FACILITY (WEF) AND UP TO 400KV GRID CONNECTION AND MTS, MPUMALANGA PROVINCE

Client:

WSP Group Africa (Pty) Ltd

Developer:

Phefumula Emoyeni One (Pty) Ltd

Prepared by:

Beyond Heritage

Private Bag X 1049

Suite 34

Modimolle

0510

Tel: 082 974 6301

Fax: 086 691 6461

E-Mail: info@heritageconsultants.co.za

Report Author:
Ms. L. Kraljević
Project Reference:
Beyond Heritage Project No 24236B and 24233
Report date:
April 2025

Disclaimer

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Document status

Document Version	V1
Report Purpose	Heritage Site Management Plan for the Phefumula Emoyeni One Wind Energy Facility (Wef) And Up To 400kv Grid Connection And Mts, Mpumalanga Province
Document Ref. No.	24236B and 24233

Responsibility	Name	Qualifications and Certifications	Date
Reporting	Lara Kraljević - Archaeologist	MA Archaeology ASAPA #661	April 2025

Distribution List

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2025/04/08	24236B and 24233	WSP Group Africa (Pty) Ltd	Electronic Copy

ACRONYMS AND ABBREVIATIONS

ASAPA: Association of South African Professional Archaeologists
BGG Burial Ground and Graves
CFPs: Chance Find Procedures
CMP: Conservation Management Plan
CRM: Cultural Resource Management
DFFE: Department of Fisheries, Forestry and Environment,
EA: Environmental Authorisation
ECO: Environmental Control Officer
EIA: Environmental Impact Assessment
EMPr: Environmental Management Programme
MPRDA: Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
NEMA National Environmental Management Act, 1998 (Act No. 107 of 1998)
NHRA National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NoK Next-of-Kin
SAHRA: South African Heritage Resources Agency

Executive Summary

Beyond Heritage was appointed to conduct Heritage Impact Assessments (HIA) (Kraljević 2025 a and b) for the Phefumula Emoyeni One Wind Energy Facility (WEF) and up to 400kv Grid Connection and MTS, Mpumalanga Province.

During the studies nineteen cemeteries or burial sites (PF002; PF004; PF007; PF008; PF009; PF010; PF011; PF017; PF022; PF024; PF028; PF031; PF033; PF034; PFM001; PFM003; PFM004; PFM008; PFM011) were recorded within the various Project areas and the sites may be at risk of being inadvertently impacted on through development activities. The impact would be irreversible, and it is therefore important that the management of the grave sites include the development of management plans/actions that will minimise and avoid negative changes/impacts to the recorded sites and promote the conservation of the sites.

Beyond Heritage was therefore approached by WSP Group Africa (Pty) Ltd to develop a Heritage Site Management Plan (HSMP) for the cemeteries as part of a Conservation Management Plan (CMP). The objective and purpose of the HSMP can be summarised as follows (Table 1).

Table 1. Objective of the HSMP

Objective	Define management and mitigation measures for *in situ* conservation that aims to remove/reduce potential risks and impacts to the grave.
Purpose	The purpose of the HSMP is to: 1. Recognise the cultural significance of the graves/ burial sites; 2. Acknowledge the sensitivities surrounding the features; 3. To understand the potential risks to the graves from development activities; and 4. To ensure the potential risks to the graves do not manifest by assessing the potential impacts and providing management recommendations for the ongoing preservation of the burial grounds that are acceptable to the various management structures.
Scope	Applies to all employees, organisational units under the developer's control, as well as contractors and service providers.

Phefumula Emoyeni One (Pty) Ltd as the custodian of the graves, is responsible for the implementation of this HSMP.

1 Contents

Disclaimer 2
ACRONYMS AND ABBREVIATIONS 4
Executive Summary 5
1. INTRODUCTION 9
1.1 Goals and aims of the HSMP 9
1.1.1 Goals 9
1.1.2 Aims 9
1.4. Legal framework 10
2 BACKGROUND TO THE HSMP 11
3 DATA INTERPRETATION: ASSESSMENT OF SIGNIFICANCE 15
3.1 Field Rating of Sites 16
4 SITE DEFINITION 18
5 HERITAGE MANAGEMENT ACTIONS 35
5.1 Heritage Management Actions and preventative protection measures 35
5.2 Heritage Awareness 38
5.4 Management Structure 39
5.5 Access 41
5.6 Potential risks 41
5.7 Monitoring 54
6 EXCLUSIONS AND LIMITATIONS 56
7 THE WAY FORWARD 56
8 REFERENCES 57

Figures

Figure 2.1. Local setting of Phefumula Emoyeni One WEF. 11
Figure 2.2. Local setting of Phefumula Emoyeni One Grid. 12
Figure 2.3. Aerial image of the Phefumula Emoyeni One WEF. 13
Figure 2.4. Aerial image of the Phefumula Emoyeni One Grid. 14
Figure 4.1. Recorded heritage sites in relation to the layout of the WEF. Burial sites are indicated in Red as of high significance. 18
Figure 4.2. Recorded heritage sites in relation to the layout of the Grid. Burial sites are indicated in Red as of high significance. 19
Figure 4.3. Brick fenced burial site at PF002. 22
Figure 4.4. Grave at PF002. 22
Figure 4.5. Overview of graves at burial site PF004. 22
Figure 4.6. Stone packed graves at PF004. 22
Figure 4.7. Overview of burial site PF007. 23
Figure 4.8. Degraded granite grave at PF007 (2011). 23
Figure 4.9. Granite grave at PF007 (1980). 23
Figure 4.10. Grave at PF007. 23
Figure 4.11. View of graves in the burial site PF008. 24
Figure 4.12. Overgrown grave at PF008. 24
Figure 4.13. Grave at PF008. 24
Figure 4.14. Brick grave at PF008 (1978). 24
Figure 4.15. Overgrown grave at PF009. 25
Figure 4.16. Granite grave at PF009 (1990). 25
Figure 4.17. Overgrown grave at PF009. 25
Figure 4.18. Single grave at PF010. 25
Figure 4.19. Single fenced off grave at PF011. 26
Figure 4.20. Single grave at PF011. 26
Figure 4.21. Site overview of burial site PF017. 26
Figure 4.22. Stone packed grave at PF017. 26
Figure 4.23. View of stone packed graves at PF022. 27
Figure 4.24. Grave at PF022 (1976). 27
Figure 4.25. Stone packed graves at PF022. 27
Figure 4.26. Granite grave at PF022 (1984). 27
Figure 4.27. Granite grave at PF024 (2014). 28
Figure 4.28. Granite grave at PF024 (2011). 28
Figure 4.29. Granite and stone grave at PF024. 28
Figure 4.30. Overgrown stone packed grave at PF024. 28
Figure 4.31. Overgrown granite and cement grave at PF024. 29
Figure 4.32. View of the two graves at burial site PF028. 29
Figure 4.33. View of fenced off burial site PF031. 29
Figure 4.34. Granite grave at PF031. 29
Figure 4.35. Granite grave at PF031 (1971). 30

Figure 4.36. Granite grave at PF031 (1974). 30
Figure 4.37. Granite grave at PF031 (1980). 30
Figure 4.38. Packed grave at PF031. 30
Figure 4.39. Granite grave at PF031 (1976). 31
Figure 4.40. Granite grave at PF031 (1961). 31
Figure 4.41. Cement and brick grave at PF031 (1950). 31
Figure 4.42. Granite grave at PF031 (1997). 31
Figure 4.43. Family grave at PF033. 32
Figure 4.44. Stone and granite grave at PF033 (1932). 32
Figure 4.45. Stone and granite grave at PF033 (1903). 32
Figure 4.46. Grave with cover at PF033. 32
Figure 4.47. Overview of burial site PF034. 33
Figure 4.48. Stone circle packed graves at PF034. 33
Figure 4.49. Granite and stone grave at PF034 (1958). 33
Figure 4.50. Stone packed grave at PF034 33
Figure 4.51. Granite grave at PF034 (1972). 34
Figure 4.52. Stone packed grave at PF034. 34
Figure 4.53. View of the single grave at PFM003. 34
Figure 4.54. View of various mounded graves in burial site PFM004. 34
Figure 4.55. Stone packed graves in burial site PFM004. 35
Figure 4.56. Cement grave with granite dressing (1984). 35

Tables

Table 1. Objective of the HSMP 5
Table 2. Legal guidelines considered. 10
Table 3. Determined heritage significance of the recorded burial sites. 17
Table 4. Location of recorded cemeteries. 19
Table 5. Management actions and preventative protection measures 36
Table 6. Suggested Training Plan Summary Table 38
Table 7. Identified and future risks, potential impacts and assessment 42
Table 8. Monitoring requirements for the cemeteries at Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS 55

1. INTRODUCTION

Nineteen cemeteries or burial sites (PF002, PF004, PF007, PF008, PF009, PF010, PF011, PF017, PF022, PF024, PF028, PF031, PF033, PF034, PFM001, PFM003, PFM004, PFM008, PFM011) were recorded within the various Project areas within the various Project areas of the Phefumula Emoyeni One Wind Energy Facility (WEF) and up to 400kv Grid Connection and MTS and the sites may be at risk of being inadvertently impacted on through development activities. The HSMP is a tool to ensure the continued protection of the recorded graves and to aid in the long-term conservation efforts for the sites.

Any impacts to the cemeteries would be irreversible, and it is therefore important that the HSMP include the development of management plans/actions that will minimise and avoid negative changes/impacts to the burial sites and enhance the positive.

1.1 Goals and aims of the HSMP.

1.1.1 Goals

The goals of the HSMP are to ensure the following:

- Increased general awareness of the identified graves / burial grounds;
- A balanced approach between development, conservation and utilization;
- Easy, clear guidelines on cost effective maintenance and management of the identified burial grounds.

1.1.2 Aims

The aims of the HSMP are:

- To define management responsibilities and actions for the recorded burial sites; and
- To provide a management framework to monitor and define the success of the HSMP.

1.2 Legal framework

This document is informed and guided by the national South African legislative framework, specifically SAHRA Site Management Plans: Guidelines for the Development of Plans for the Management of Heritage Sites or Places (2006) and draft Development Heritage Management Plan (DHMP) and the Burial Grounds and Graves Permitting Policy (2020). The legal framework that guided the principles of this document are outlined in Table 2.

Table 2. Legal guidelines considered.

Applicable guidelines considered	Description
Development of an HSMP as provided for in Section 47 (3) of the National Heritage Resources Act No 25 of 1999 (NHRA)	Compilation of a HSMP was commissioned to ensure the responsible management of the identified burial sites.
The Extension of Security of Tenure Act, 1997. Chapter III Section 6(4)	Any person shall have the right to visit and maintain his or her family graves on land which belongs to another person, subject to any reasonable condition imposed by the owner or person in charge of such land to safeguard life or property or to prevent the undue disruption of work on the land.
National Heritage Resource Act 25 of 1999, Section 36	**(3) No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority—** (d) destroy, damage, alter, exhume, or remove from its original position or otherwise disturb the grave of a victim of conflict, or any burial ground or part thereof which contains such graves; (e) destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority; or (f) bring onto or use at a burial ground or grave referred to in paragraph (a) or (b) any excavation equipment, or any equipment which assists in the detection or recovery of metals.

2 BACKGROUND TO THE HSMP

WSP Group Africa (Pty) Ltd has been appointed as the independent Environmental Assessment Practitioner (EAP) to undertake the EA application process for the process to develop the Phefumula Emoyeni One Wind Energy Facility (WEF) and up to 400kv Grid Connection and MTS, in Mpumalanga Province situated on the various Farms in the Msukaligwa Local Municipality within the Gert Sibande District Municipality and Beyond Heritage was subsequently appointed to conduct the Heritage Impact Assessments (HIA) for the projects. During the HIAs, nineteen cemeteries were identified within the Project areas (Figure 2.1 – 2.4).

Potential impact to these sites necessitated further action. Beyond Heritage was therefore requested to assist with a management plan for the *in-situ* preservation and management of the cemeteries. This included the development of an HSMP to ensure the continued *in-situ* protection of the identified graves.

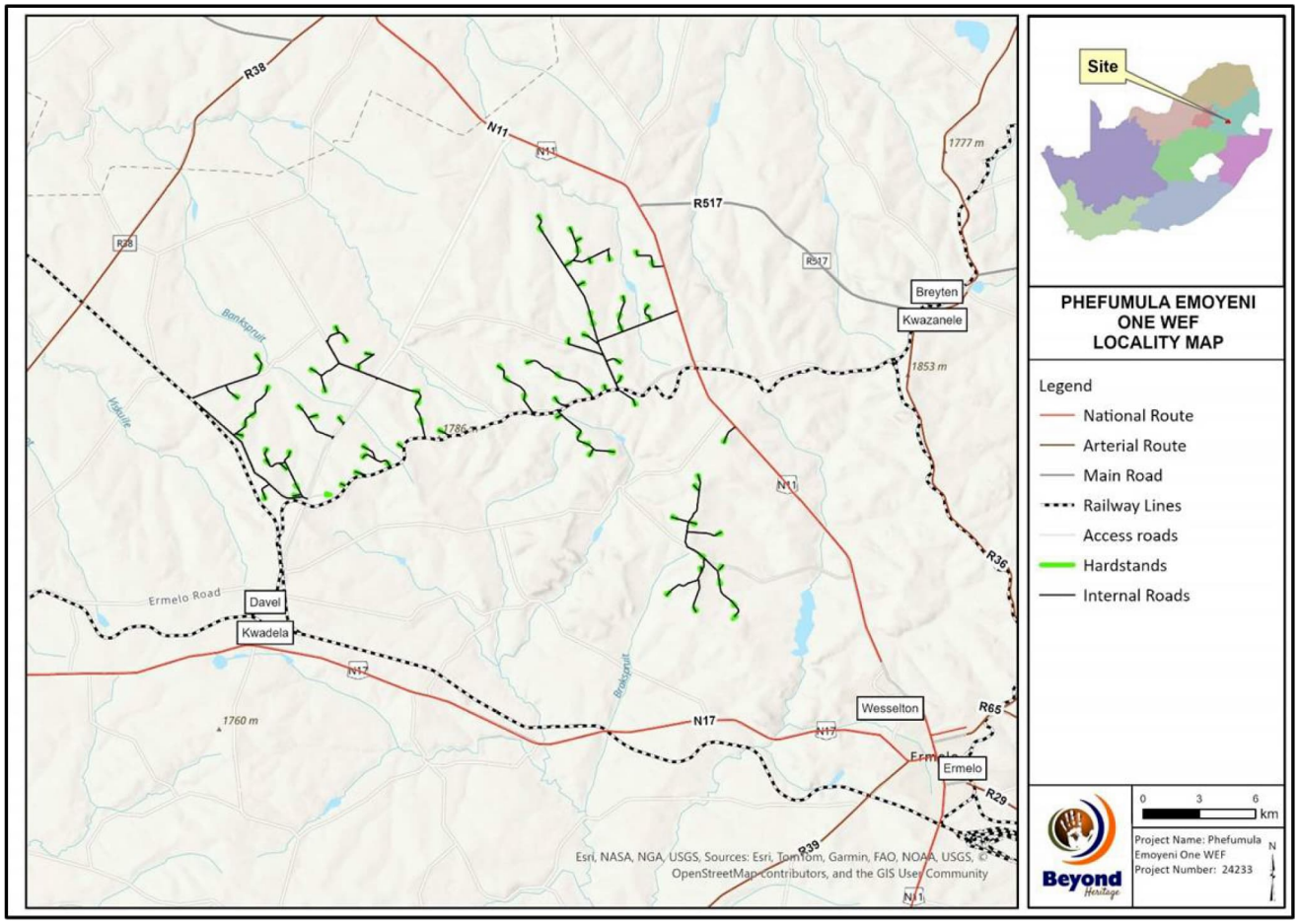


Figure 2.1. Local setting of Phefumula Emoyeni One WEF.

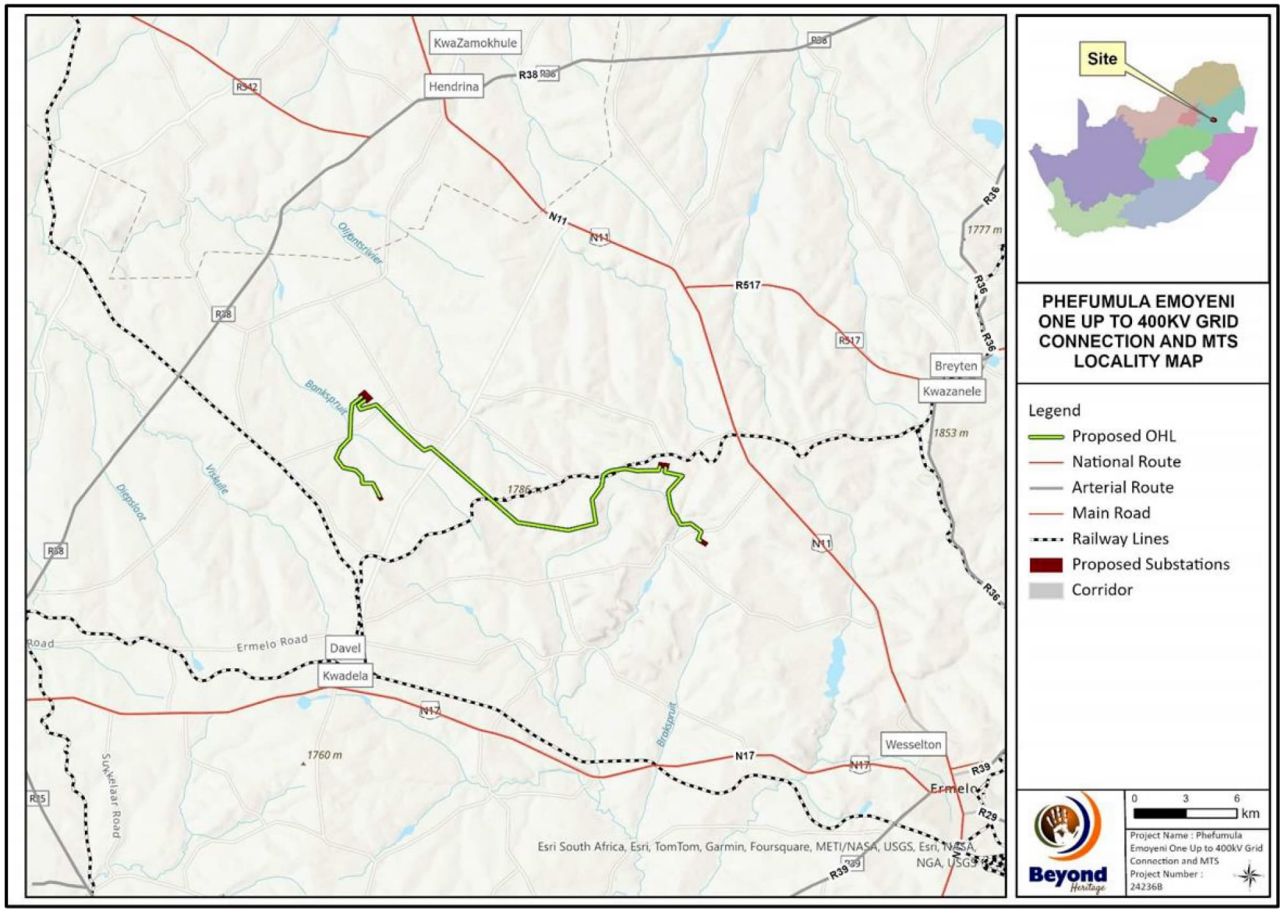


Figure 2.2. Local setting of Phefumula Emoyeni One Grid.

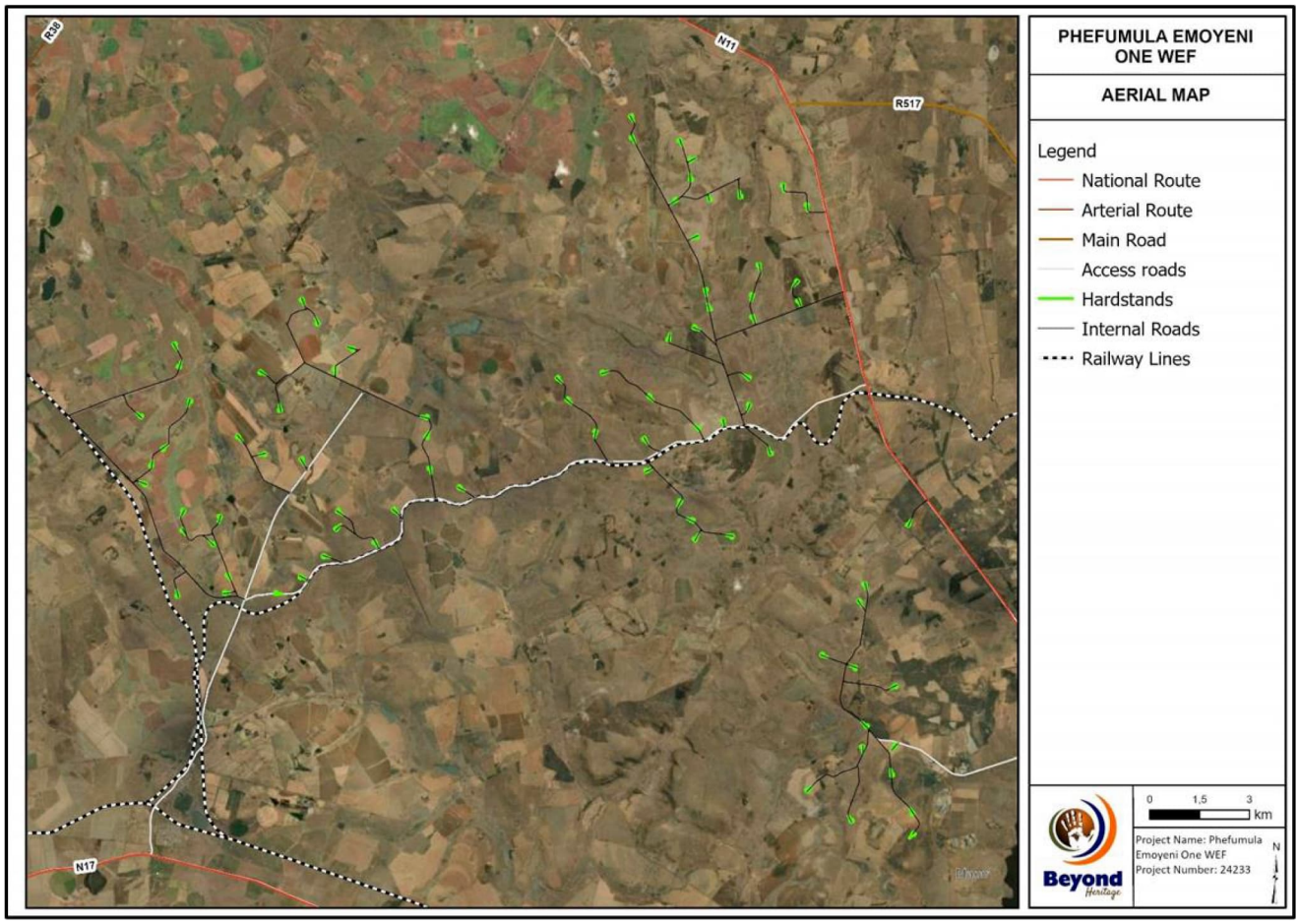


Figure 2.3. Aerial image of the Phefumula Emoyeni One WEF.

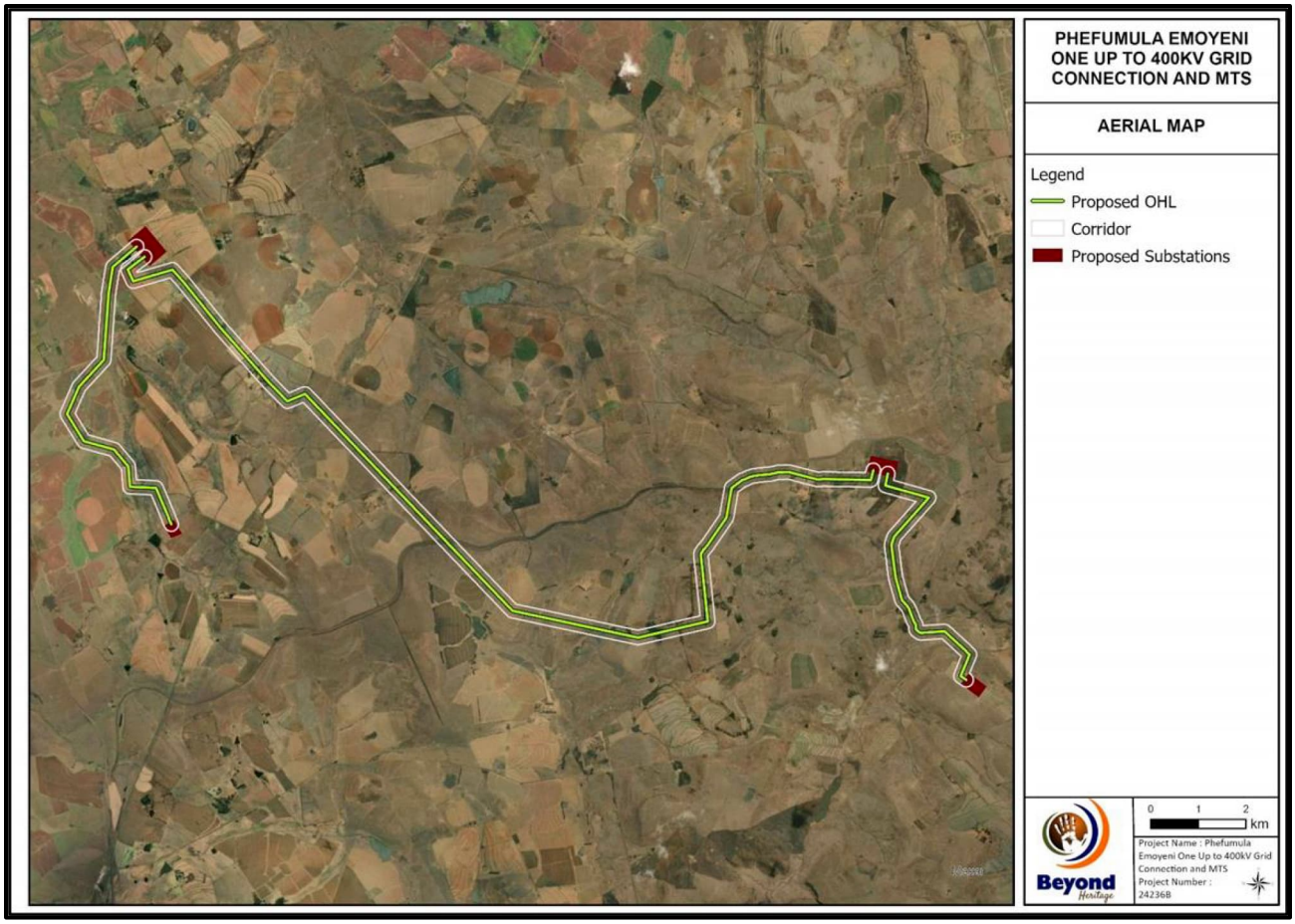


Figure 2.4. Aerial image of the Phefumula Emoyeni One Grid.

3 DATA INTERPRETATION: ASSESSMENT OF SIGNIFICANCE

The NHRA (Act No 25 of 1999, Section 3) distinguishes nine criteria for places and objects to qualify as 'part of the national estate' if they have cultural significance or other special value. These criteria with applicable provisions highlighted are:

- Its importance in/to the community, or pattern of South Africa's history;
- Its possession of uncommon, rare, or endangered aspects of South Africa's natural or cultural heritage;
- Its potential to yield information that will contribute to an understanding of South Africa's natural or cultural heritage;
- Its importance in demonstrating the principal characteristics of a particular class of South Africa's natural or cultural places or objects;
- Its importance in exhibiting aesthetic characteristics valued by a community or cultural group;
- Its importance in demonstrating a high degree of creative or technical achievement at a particular period;
- **Its strong or special association with a particular community or cultural group for social, cultural, or spiritual reasons;**
- **Its strong or special association with the life or work of a person, group, or organisation of importance in the history of South Africa;**
- Sites of significance relating to the history of slavery in South Africa.

3.1 Field Rating of Sites

Site significance classification standards prescribed by SAHRA (2006) and acknowledged by Association of South African Professional Archaeologists (ASAPA) for the Southern African Development Community (SADC) region, were used for the purpose of this report. Field ratings assist the responsible heritage resources authority to grade heritage resources into national (Grade I), provincial (Grade II) or local (Grade III) categories and are required under Chapter II Section 7(J) of the SAHRA Minimum Standards.

FIELD RATING	***GRADE***	***SIGNIFICANCE***	***RECOMMENDED MITIGATION***
National Significance (NS)	Grade 1	-	Conservation; national site nomination
Provincial Significance (PS)	Grade 2	-	Conservation; provincial site nomination
Local Significance (LS)	**Grade 3A**	**High significance**	**Conservation; mitigation not advised**
Local Significance (LS)	Grade 3B	High significance	Mitigation (part of site should be retained)
Generally Protected A (GP. A)	-	High/medium significance	Mitigation before destruction
Generally Protected B (GP. B)	-	Medium significance	Recording before destruction
Generally Protected C (GP.C)	-	Low significance	Destruction

Graves are considered to be of high social significance and based on this is given a **Generally Protected 3A field rating.**

Additionally, the SAHRA Guidelines for heritage site management plans identified the following aspects of cultural significance as described in the context of this management plan outlined in Table 3.

Table 3. Determined heritage significance of the recorded burial sites.

Label	Type sites	Significance	Significance
PF002 PF004 PF007 PF008 PF009 PF011 PF017 PF022 PF024 PF028 PF031 PF033 PF034 PFM001 PFM003 PFM004 PFM008 PFM011	Burial Sites	Cultural significance can be determined by establishing the Social, Historic, Scientific and Aesthetic Values of the site. **Social Value** Social value embraces the qualities for which a place has become a focus of spiritual, political, national, or other cultural sentiments to a majority or minority group. Graves and burial sites are of high social significance. **Historic Value** This value recognizes the contribution a place makes to the achievements of, and to our knowledge of, the past. **Scientific Value** These are features of a place that provide or have a realistic potential to yield knowledge that is not obtainable elsewhere. **Aesthetics Value** Aesthetic value may be described as the beauty of design, association or mood that the place possesses, or it may be demonstration in a place, of a particular design, style, and artistic development of high level or craftsmanship. This is a recognition that a place represents a high point of the creative achievement in its design, its style, artistic development and craftsmanship. Aesthetic value may sometimes be difficult to measure or quantify.	High Significance Grade 3A

4 SITE DEFINITION

The Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS was visited by Beyond Heritage in 2024 and 2025. The locations of the burial sites were recorded as PF002, PF004, PF007, PF008, PF009, PF010, PF011, PF017, PF022, PF024, PF028, PF031, PF033, PF034, PFM001, PFM003, PFM004, PFM008, PFM011 (Figure 4.1 and Figure 4.2). Zoomed in images of the recorded heritage sites are available in Kraljevic 2025 a and b. Site locations and a description of the sites and current site conditions is included in Table 4. General site conditions of cemeteries situated are indicated in Figure 4.3 – 4.56.

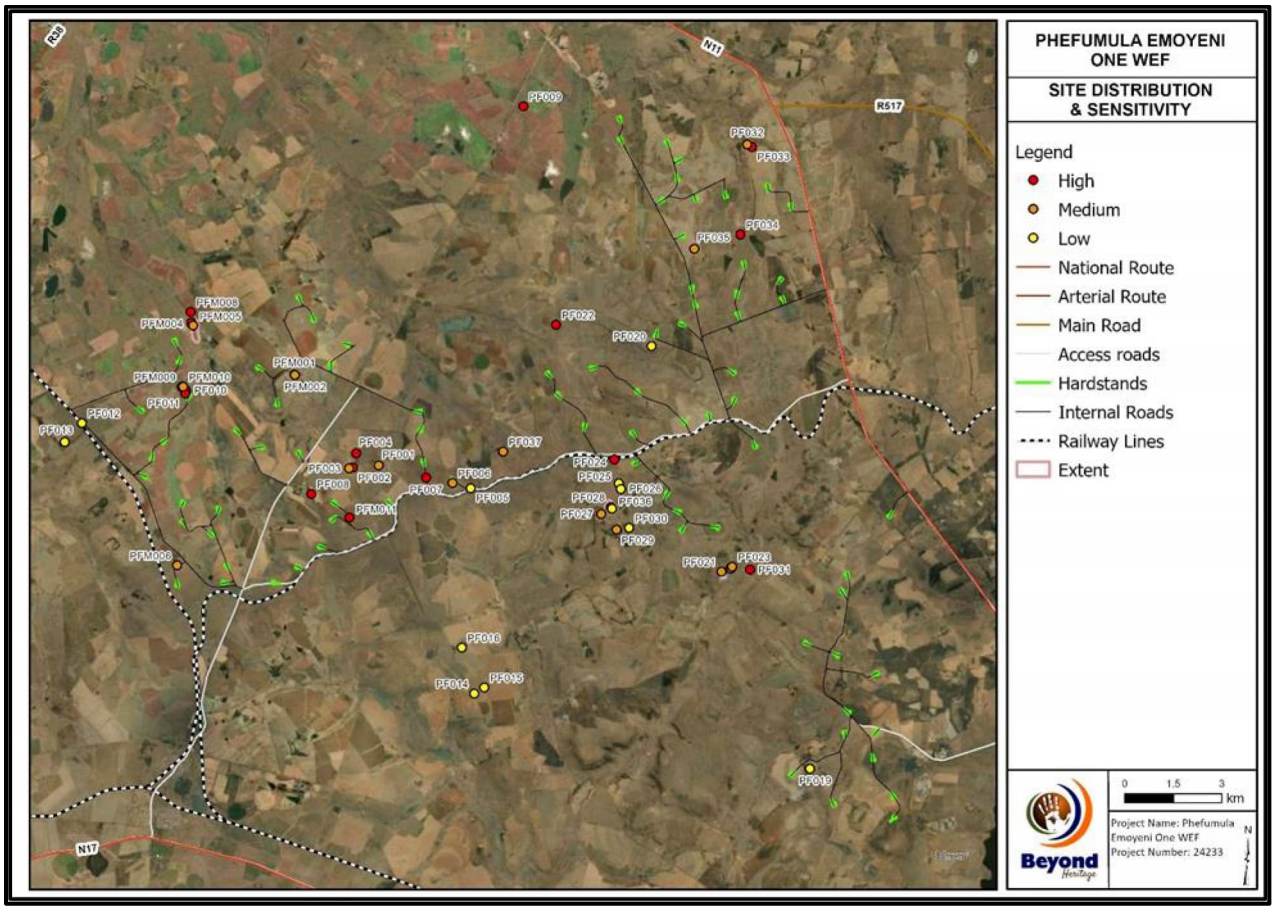


Figure 4.1. Recorded heritage sites in relation to the layout of the WEF. Burial sites are indicated in Red as of high significance.

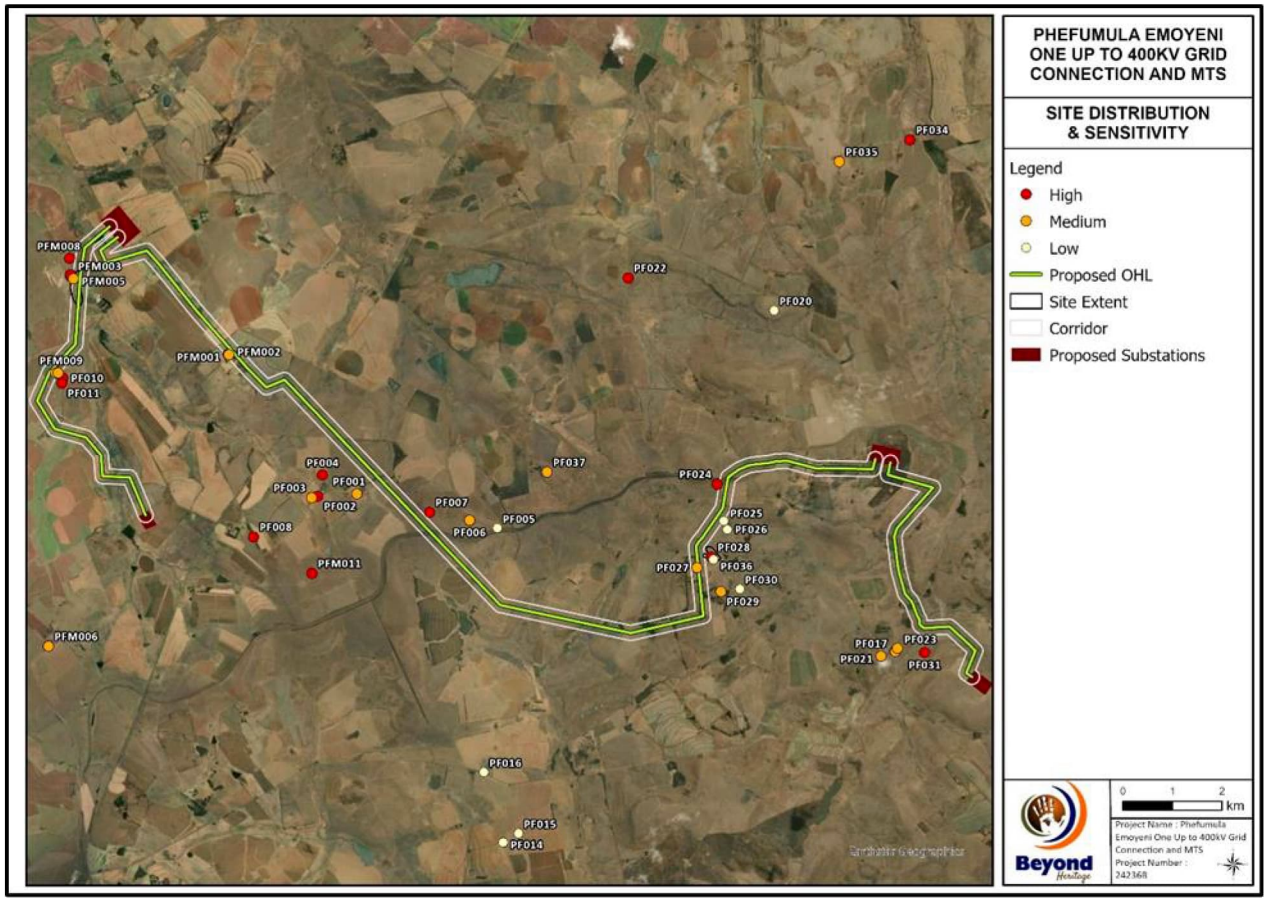


Figure 4.2. Recorded heritage sites in relation to the layout of the Grid. Burial sites are indicated in Red as of high significance.

Table 4. Location of recorded cemeteries.

Label	Longitude	Latitude	Description	Significance
PF002	29°43'2.21"E	26°21'49.53"S	Historical Burial site – 6 graves located within a brick-built family cemetery	High Significance 3A
PF004	29°43'4.94"E	26°21'35.42"S	Large burial site – 65 – 70 packed stone and various cement graves, some graves have newer granite headstones and skirting.	High Significance 3A
PF007	29°44'24.13"E	26°21'56.96"S	Burial site. 13 to 15 graves situated within a cement and concrete built cemetery. The graves consist of various degraded and collapsed granite headstones and skirting.	High Significance 3A

PF008	29°42'16.53"E	26°22'17.56"S	Burial site situated under a large thicket of trees along the edge of existing agricultural fields. – 70 to 80 various graves built from granite, packed stone, cement and brick. Sections of the cemetery is still being maintained.	High Significance 3A
PF009	29°45'56.03"E	26°15'41.45"S	Burial site – 3 graves situated on the edge of an existing agricultural field on top of the ploughed contour line. 1 grave has a granite headstone and skirting with the other 2 having degraded brick and stone skirting. The burial site is highly disturbed.	High Significance 3A
PF010	29°39'52.78"E	26°20'38.67"S	Burial site – 1 brick built grave situated in a small open field.	High Significance 3A
PF011	29°39'52.12"E	26°20'42.16"S	Burial site – 1 fenced off grave with an overgrown granite headstone.	High Significance 3A
PF017	29°50'7.41"E	26°23'15.59"S	Two stone packed graves situated within a 10-meter circular stone packed enclosure. The site forms part of the larger ruins of PF018	High Significance 3A
PF022	29°46'42.13"E	26°19'18.65"S	Burial site – 28 graves. Majority have granite headstones and skirting. Some made from packed stone, and some built from brick and cement. Fenced off.	High Significance 3A
PF024	29°47'53.13"E	26°21'31.13"S	Burial site – Large cemetery situated next to a possible historical railway line. Contains 75+ graves made from various materials such as stone packed, granite and brick.	High Significance 3A
PF028	29°47'51.12"E	26°22'18.92"S	Burial site containing two stone packed graves and metal grave markers situated near a large area containing the ruins of an informal settlement at PF036	High Significance 3A
PF031	29°50'29.24"E	26°23'15.85"S	Burial site containing 20-25 graves made from various materials such as granite, cement and brick and stone packed grave dressings.	High Significance 3A
PF033	29°50'12.11"E	26°16'13.07"S	Burial site – Historical cemetery with large cement and brick wall. Containing 8 graves with granite and cement headstones and covers. Oldest grave 1908	High Significance 3A

PF034	29°50'3.57"E	26°17'41.09"S	Burial site – Large informal burial site containing 30 – 35 graves made from packed stone, granite and cement.	High Significance 3A
PFM001	29°43'30.73"E	26°21'46.70"S	Small fenced off burial site containing 3 graves of the Durr family. The original grave dates to 1935 while the two other graves date to 2010 and 2011.	High Significance 3A
PFM003	29°42'57.77"E	26°21'50.46"S	Small burial site containing one grave which has been fenced off using logs and wire.	High Significance 3A
PFM004	29°39'55.61"E	26°19'31.87"S	Large fenced off burial site consisting of 60 -70 graves. Many of the graves are stone packed graves, with some formal granite graves. Many graves have also overgrown and are mounded graves.	High Significance 3A
PFM008	E29° 39' 54.4"	S26° 19' 20.3"	Cemetery with 25 graves. 17 stone packed graves, 2 brick packed graves and 6 marble graves with engraved headstones.	High Significance 3A
PFM011	29°39'49.21"E	26°20'35.40"S	Possible grave. This site has some stone laid in a row as well as a large stone that is erected on its side which could serve the purpose of a headstone. The site has unfortunately been eroded by water.	High Significance 3A



Figure 4.3. Brick fenced burial site at PF002.



Figure 4.4. Grave at PF002.



Figure 4.5. Overview of graves at burial site PF004.



Figure 4.6. Stone packed graves at PF004.

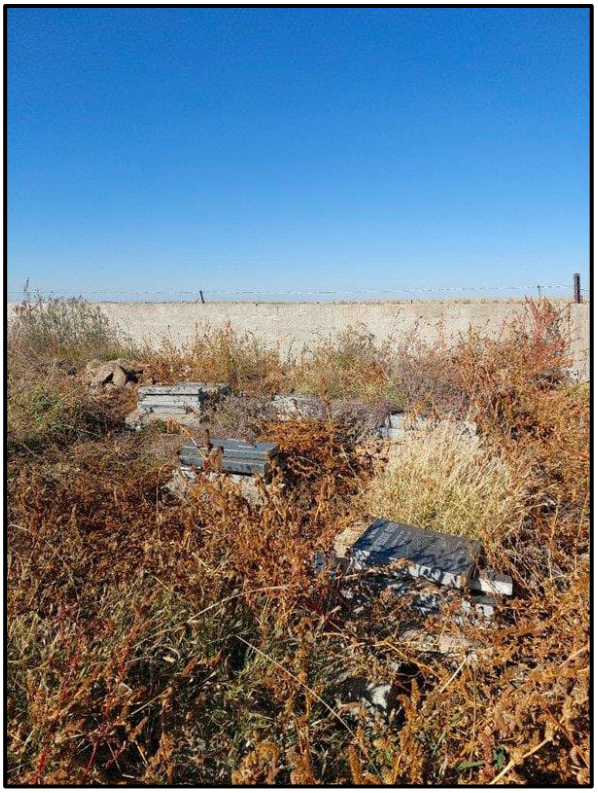


Figure 4.7. Overview of burial site PF007.

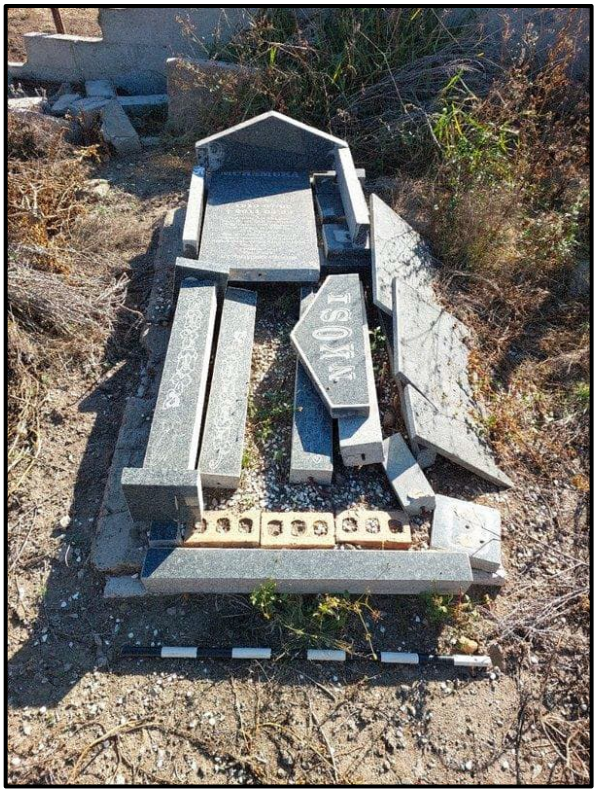


Figure 4.8. Degraded granite grave at PF007 (2011).

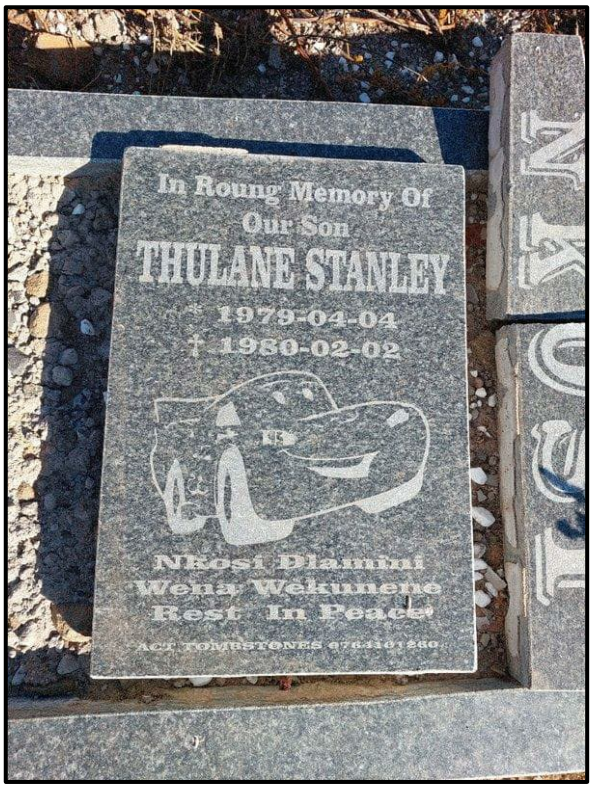


Figure 4.9. Granite grave at PF007 (1980).



Figure 4.10. Grave at PF007.

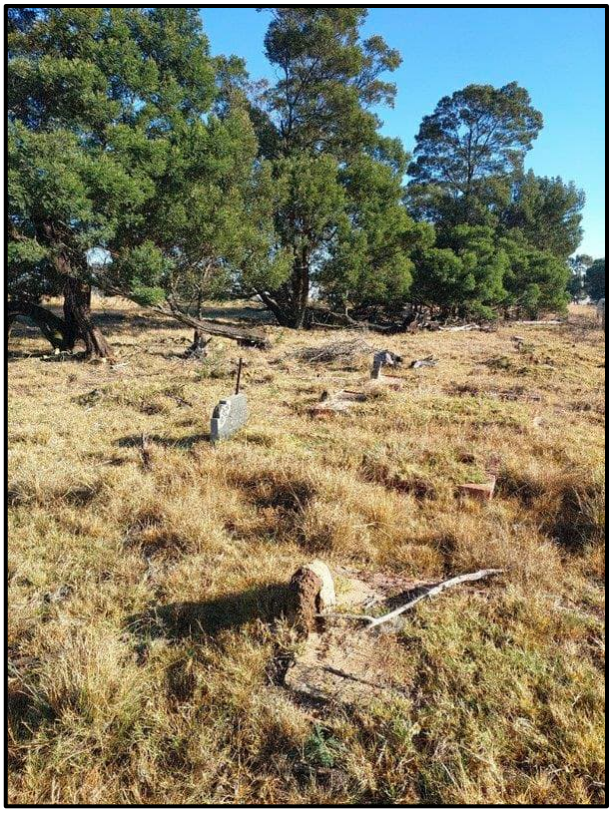


Figure 4.11. View of graves in the burial site PF008.

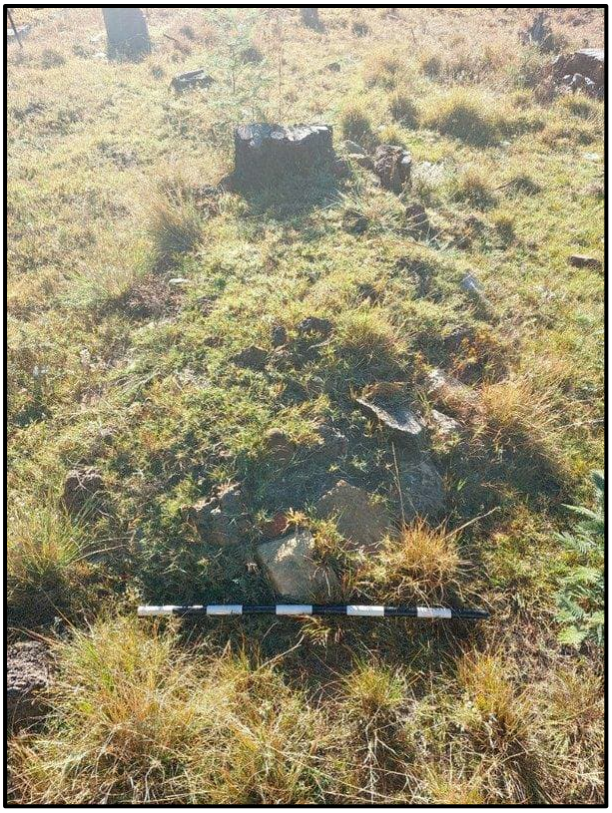


Figure 4.12. Overgrown grave at PF008.



Figure 4.13. Grave at PF008.

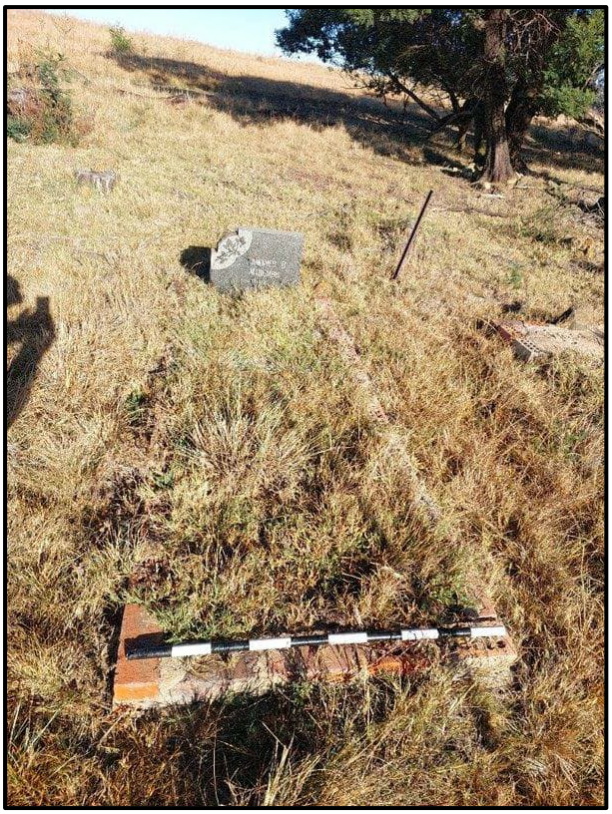


Figure 4.14. Brick grave at PF008 (1978).

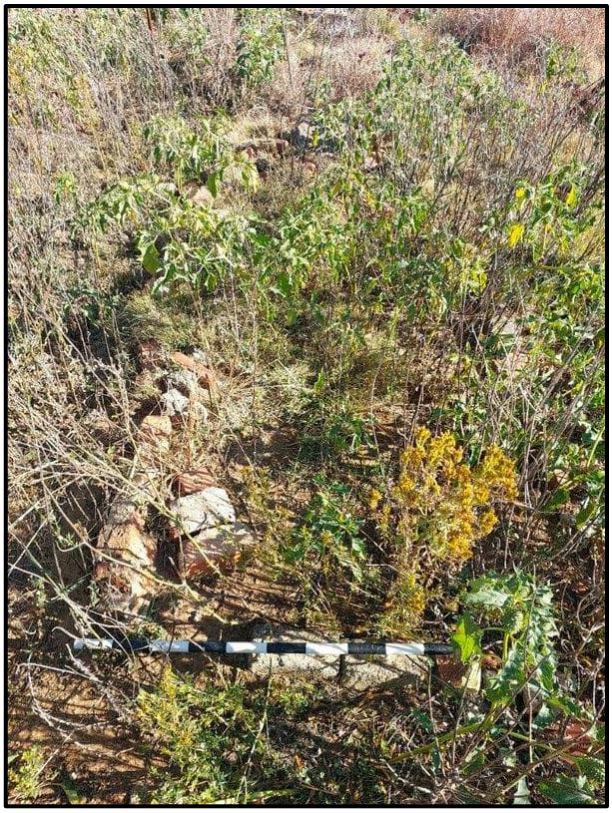


Figure 4.15. Overgrown grave at PF009.

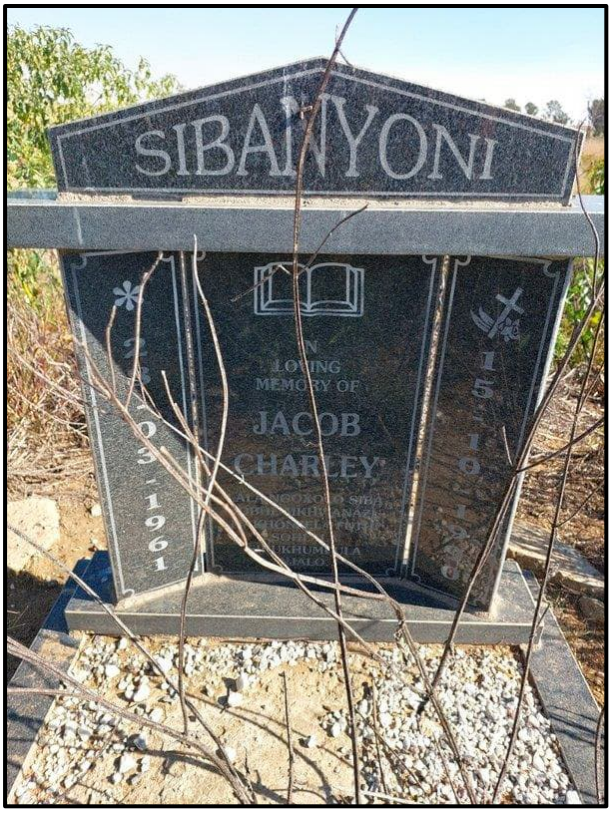


Figure 4.16. Granite grave at PF009 (1990).

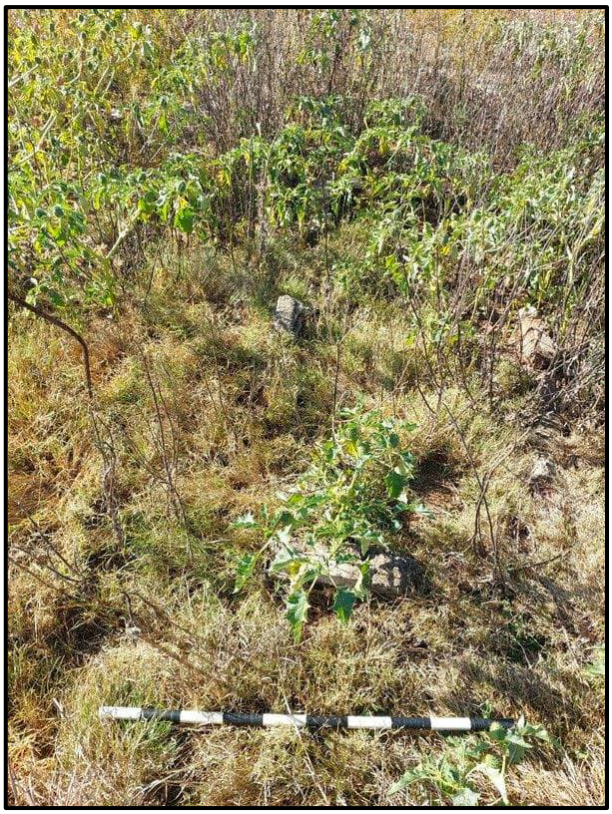


Figure 4.17. Overgrown grave at PF009.

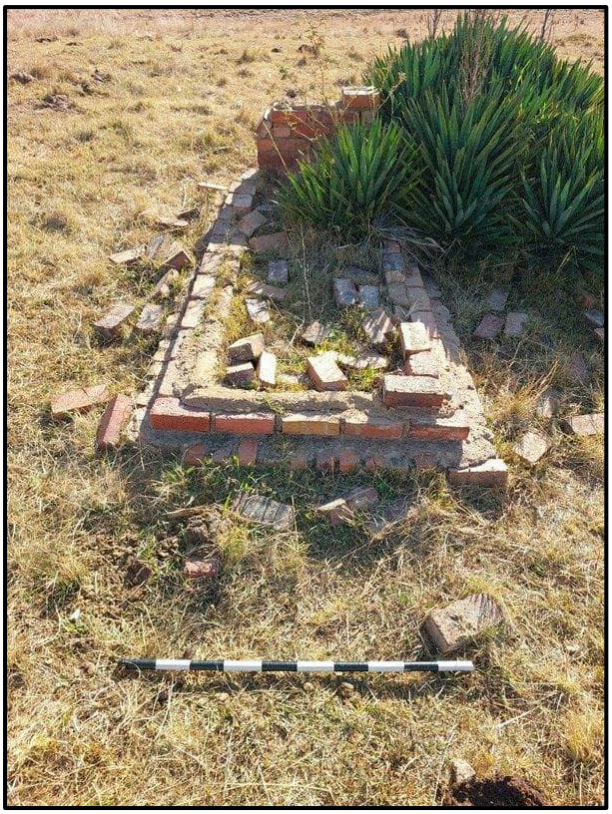


Figure 4.18. Single grave at PF010.



Figure 4.19. Single fenced off grave at PF011.



Figure 4.20. Single grave at PF011.



Figure 4.21. Site overview of burial site PF017.

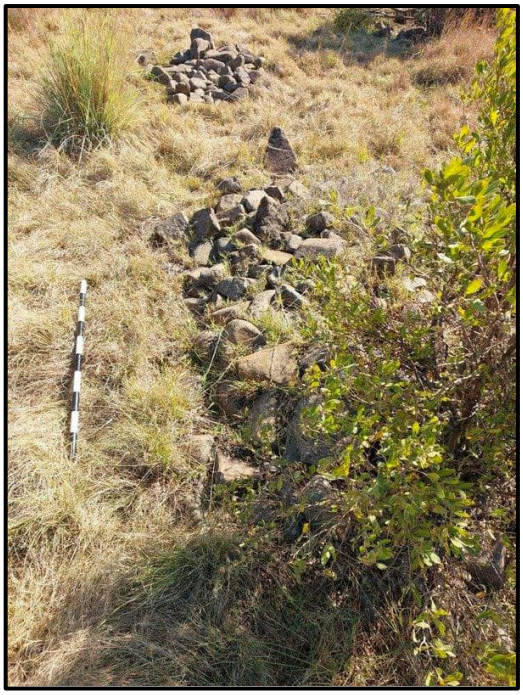


Figure 4.22. Stone packed grave at PF017.



Figure 4.23. View of stone packed graves at PF022.



Figure 4.24. Grave at PF022 (1976).



Figure 4.25. Stone packed graves at PF022.

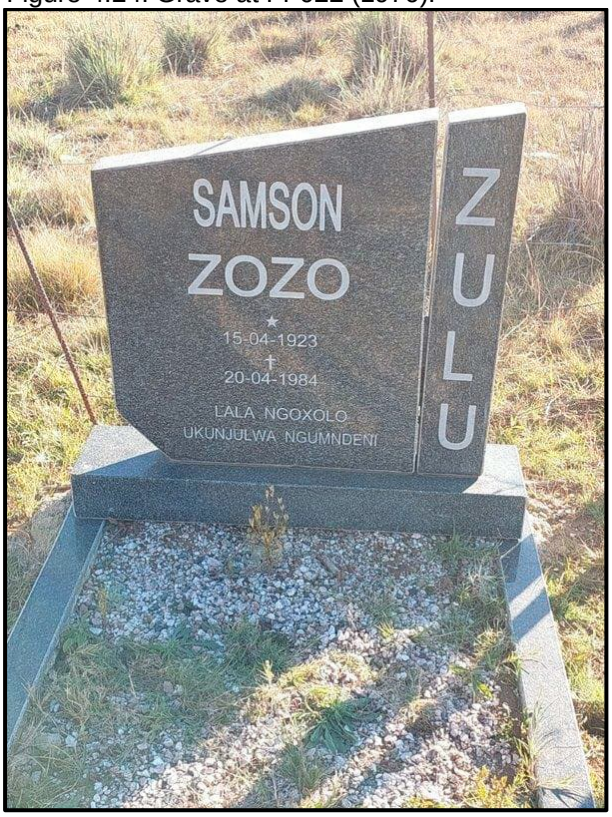


Figure 4.26. Granite grave at PF022 (1984).



Figure 4.27. Granite grave at PF024 (2014).



Figure 4.28. Granite grave at PF024 (2011).


Figure 4.29. Granite and stone grave at PF024.


Figure 4.30. Overgrown stone packed grave at PF024.

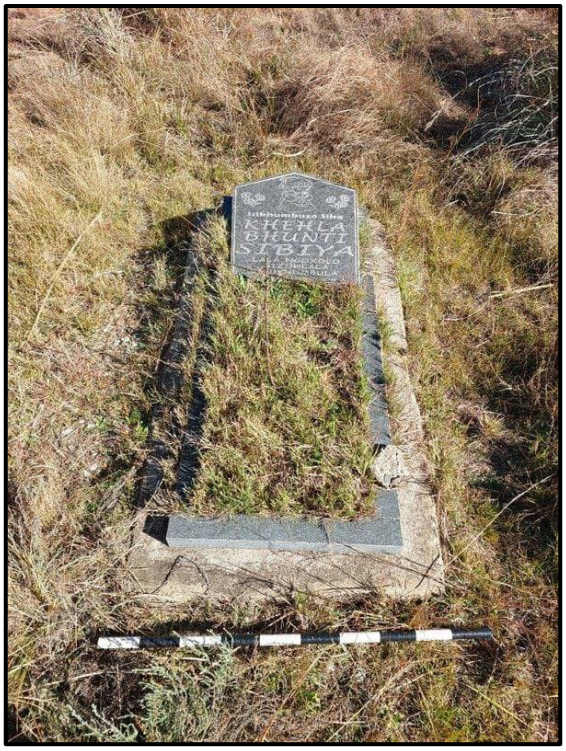


Figure 4.31. Overgrown granite and cement grave at PF024.



Figure 4.32. View of the two graves at burial site PF028.



Figure 4.33. View of fenced off burial site PF031.



Figure 4.34. Granite grave at PF031.



Figure 4.35. Granite grave at PF031 (1971).

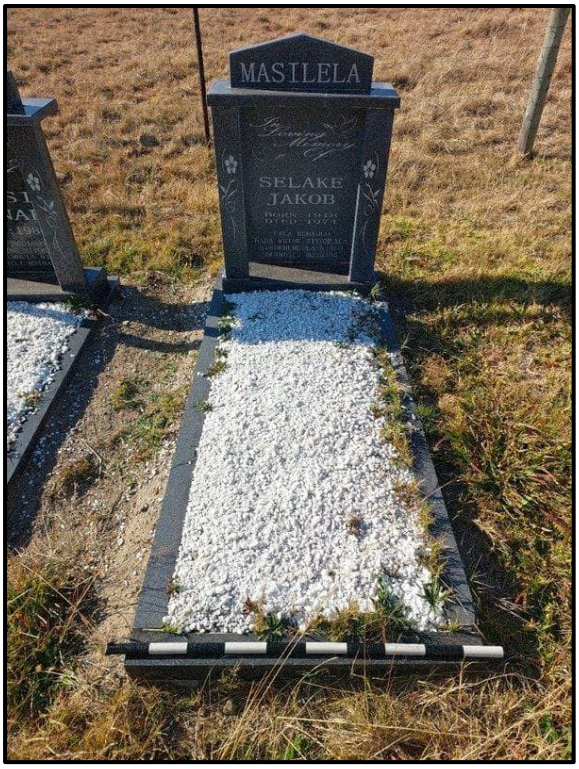


Figure 4.36. Granite grave at PF031 (1974).



Figure 4.37. Granite grave at PF031 (1980).


Figure 4.38. Packed grave at PF031.

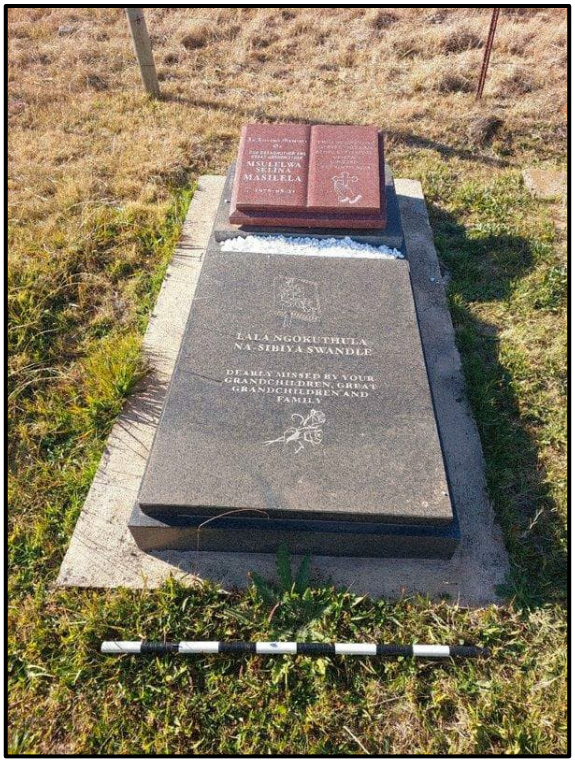


Figure 4.39. Granite grave at PF031 (1976).

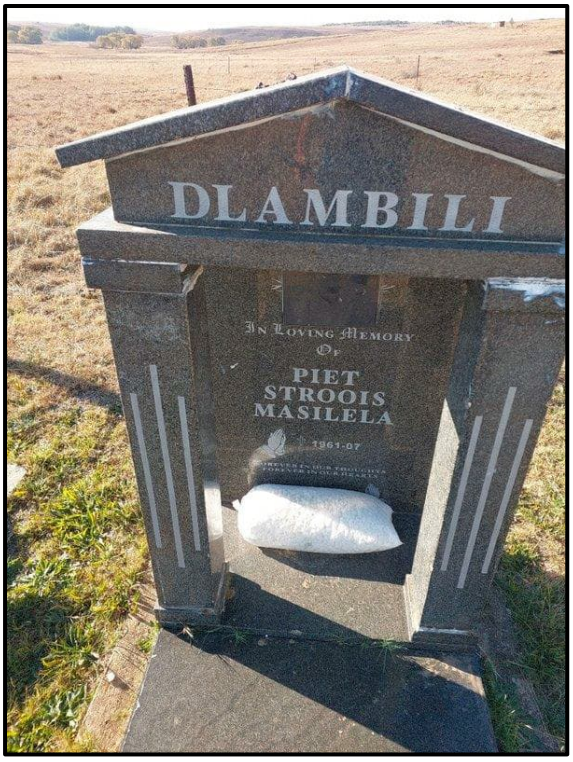


Figure 4.40. Granite grave at PF031 (1961).

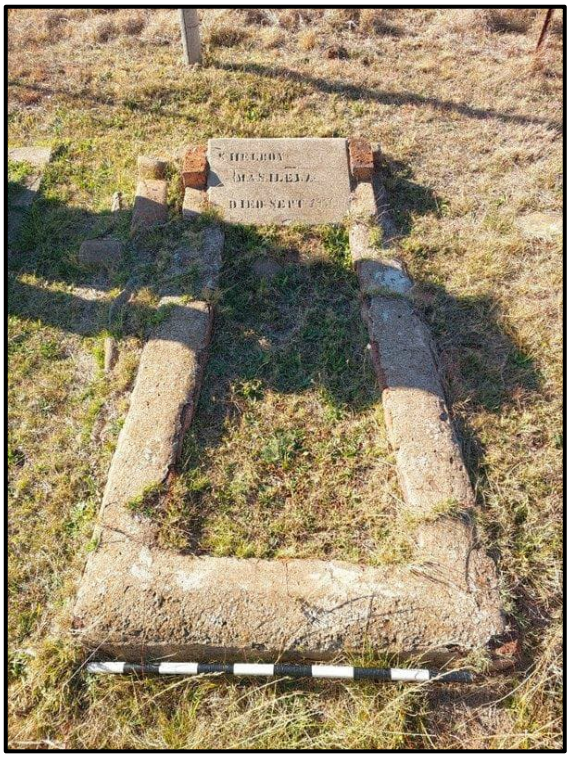


Figure 4.41. Cement and brick grave at PF031 (1950).

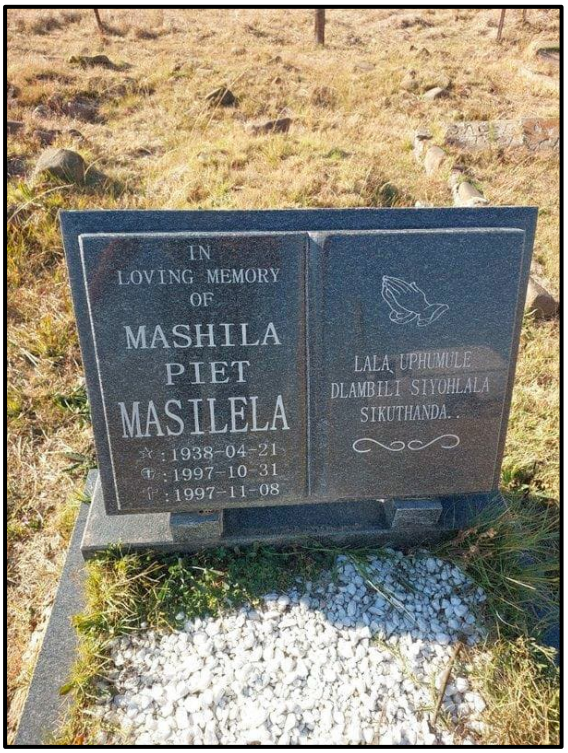


Figure 4.42. Granite grave at PF031 (1997).



Figure 4.43. Family grave at PF033.

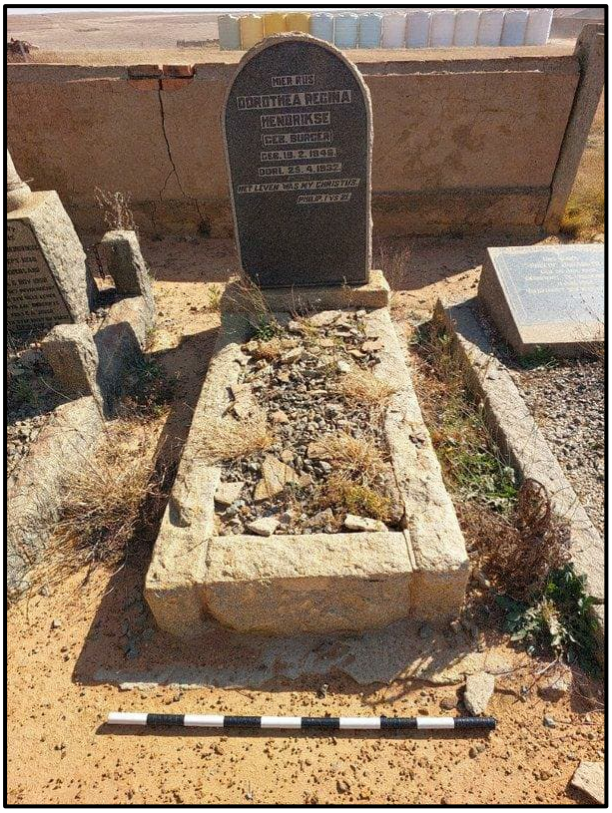


Figure 4.44. Stone and granite grave at PF033 (1932).

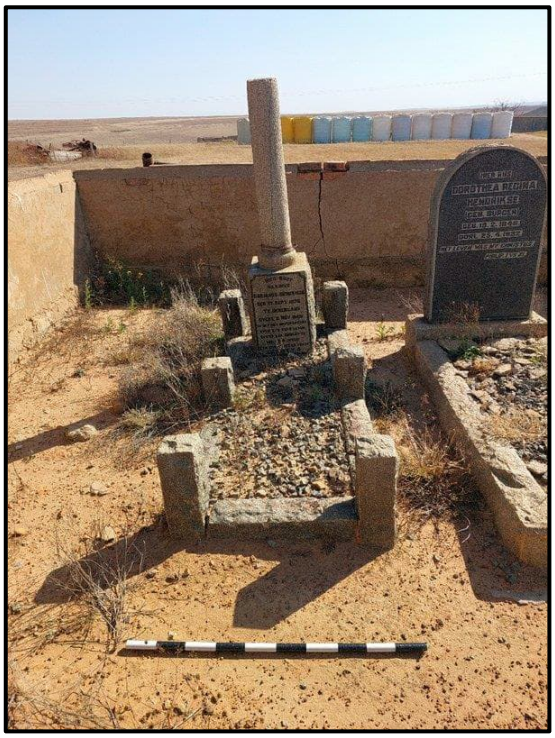


Figure 4.45. Stone and granite grave at PF033 (1903).



Figure 4.46. Grave with cover at PF033.



Figure 4.47. Overview of burial site PF034.



Figure 4.48. Stone circle packed graves at PF034.



Figure 4.49. Granite and stone grave at PF034 (1958).



Figure 4.50. Stone packed grave at PF034.



Figure 4.51. Granite grave at PF034 (1972).

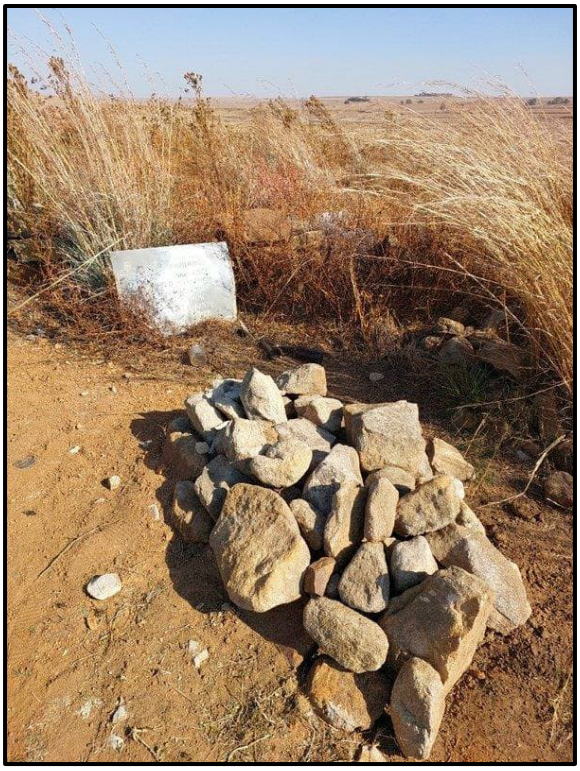

Figure 4.52. Stone packed grave at PF034.


Figure 4.53. View of the single grave at PFM003.


Figure 4.54. View of various mounded graves in burial site PFM004.



Figure 4.55. Stone packed graves in burial site PFM004.



Figure 4.56. Cement grave with granite dressing (1984).

5 HERITAGE MANAGEMENT ACTIONS

5.1 Heritage Management Actions and preventative protection measures

This chapter details the required preservation/management mechanism applicable to the Project.
The principles for planning and actions are directly correlated to and guided by defined objectives, targets and strategies as well as Preventative protection measures to prevent degradation and inadvertent impacts to the burial sites from potential risks associated with the development of the area. Management and Preventative protection measures comply with the following standards and are presented in Table 5.

- The National Heritage Resources Act, 1999 (Act No. 25 of 1999)
- Regulations to the National Heritage Resources Act (GN R 548)
- BGG Permitting Policy (2020)
- The Extension of Security of Tenure Act, 1997. Chapter III Section 6(4)

Table 5. Management actions and preventative protection measures

Objective	Action	Strategy
To comply with the requirements of the national legislative framework, with specific reference to the NHRA in terms of Section 36(3) where no person may, without a permit issued by SAHRA (b) destroy, damage, alter, exhume or remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. To safeguard tangible cultural heritage. To facilitate sustainable use of the heritage site.	Increase awareness of the site; *In situ* conservation of the graves; Identification of risks and proactive management of identified risks; Monitoring the grave site and surrounding area.	Training and indication of the burial site on development plans; Implementation of recommendations of this HSMP; Employ mitigation measures as outlined in the HSMP; Regular Monitoring and reporting on the Status Quo of the burial sites.
Preserve the grave sites *in situ*	Avoid accidental damage or destruction of the grave during construction and associated activities.	Indicate the burial sites on all development plans; Demarcate the grave site ensuring access for family members (adhering to legal requirements and relevant permits). Maintain a buffer zone of 30 m around the grave sites to maintain the status quo.
	Ensure continuous protection of the grave site.	Future developments in these areas should be limited and if development cannot be avoided in these areas, the development will be subject to SAHRA approval and the correct permit application procedure. The sites should be monitored and maintained (cleaned) on an ongoing basis.
		Implement a Storm Water Management plan to avoid direct or indirect impacts to the graves.
		Establish Access Protocol to graves for NoK.
		Demarcate the sites with access gate to provide physical barrier (adhering to legal requirements and relevant permits).
		The Community Liaison team should liaise with the community regarding the protection of the graves and the measures contained in the HSMP.
		Complete annual maintenance to remove overgrowth and reduce intensity of natural degradation processes.
Access	Ensure safe access to the graves for family members	Develop a suitable access protocol to ensure respectful, controlled, and culturally appropriate access for descendants and stakeholders (Section 5.5)

Chance Find Procedure	Monitoring of the Project area by the ECO during pre-construction and construction phases for heritage and burial site chance finds,	If chance finds are encountered to implement the Chance Find Procedure for the Project (Kraljevic 2025 a and b)
Stone Cairns	PFM011 is a possible burial site and if the site cannot be avoided with a 30m buffer further investigation will be required to determine whether it is indeed a grave. If so, the management actions in this report will apply.	Avoidance with a 30m buffer; If avoidance is not possible Ground Penetrating Radar/ test excavations can be conducted subject to the relevant permits to determine whether the site represents a grave.

5.2 Heritage Awareness

It is important to ensure that all employees and contractors working within the Phefumula Emoyeni One WEF and on the up to 400kv Grid Connection and MTS are aware of the applicable heritage legislation and the significance of grave sites. It is recommended that this is communicated during induction training for employees and contractors as well as through notices placed in strategic places, highlighting the South African Heritage Resources Act (Act 25 of 1999). A summary of a suggested training plan is included in Table 6.

Table 6. Suggested Training Plan Summary Table

Training Module	Target Audience	Training Content	Frequency	Responsible Party
Visitor Induction Briefing	Visitors, guests, contractors (short version)	Code of conduct, permitted access, grave sensitivity, emergency contacts	At each entry/visit	Site Custodian
Heritage Legislation & Compliance	Site custodians, contractors, officials	Overview of NHRA, Section 36, roles of SAHRA/PHRA, compliance obligations	Once-off (refresher as needed)	Heritage Specialist
Grave Identification & Field Recognition	Custodians, contractors, local reps	Surface indicators of graves, mapping, documentation, confidentiality	Annual refresher	Heritage Specialist
Chance Find Protocol (CFP) Training	Contractors, site staff, supervisors	Procedures, legal steps, chain of reporting, halt-of-work steps	Prior to construction phase	Environmental Officer, Consultant
Cultural Sensitivity & Consultation	All project personnel, including contractors	Belief systems, respect for cultural sites, engagement etiquette	Once-off; optional refresher	Community Liaison
Basic Site Conservation Techniques	Custodians, local monitors	Vegetation clearing, erosion control, maintenance of buffers and signage	Annual	Site Manager, Contractor
Documentation & Reporting Protocols	Custodians, environmental monitors	Recording grave information, visitor logs, incident reports	Bi-annually	Environmental Officer Site Manager

5.3 Ownership structures

Ownership of the grave reside with the *bona fide* NoK including:

1. The surviving spouse or partner of the deceased;
2. In the absences of a surviving spouse or partner, the eldest adult child of the deceased;
3. In the absence of an adult child, a parent of the deceased;
4. In the absence of a parent, an adult sibling of the deceased; and
5. In the absence of a sibling, the closest adult relative to the deceased.

Where the *bona fide* NoK are unknown the landowners/ developers will be considered the custodian of these graves.

5.4 Management Structure

SAHRA is the competent authority responsible for the regulation of the HSMP in terms of the national legislative framework. The developer is ultimately responsible for managing heritage resources in the project area in a legally compliant and socially responsible manner. Generally, the environmental team or Environmental Control Officer (ECO) take responsibility for the day-to-day management and monitoring of heritage resources or appoint a suitably qualified person to do so. The responsible party must ensure that all actions and planned development that might have an impact (indirectly or directly) on heritage resources are subject to the requirements and guidelines in this HSMP.

The various responsibilities and competencies include:

Positions	Responsibility
Environmental Control Officer	Ultimately responsible for the implementation of this HSMP in accordance with the legislative requirements and defined scope of this HSMP.
Environmental Control Officer	Responsible for identifying risks applicable to their area of responsibility as it may relate to the grave and this HSMP.
	Ensuring identified risks for their area of responsibility as it may relate to the grave and this HSMP are mitigated and updated on a continuous basis.
	Ensuring this HSMP as it may be relevant to their area of responsibility is implemented and adhered to.
Environmental Control Officer	Communication of the scope and procedures contained within this HSMP to support the developer.
	Ensuring identified risks to the burials are captured and recorded in the SHE Risk/Impact Register.
	Ensuring this HSMP is always implemented and adhered to.
	Progress reporting as defined in this HSMP for submission to the relevant competent authorities.
Environmental Control Officer	Communication of the scope and procedures contained within this HSMP to support staff.
	Responsible for identifying risks applicable to the burial sites and this HSMP that may manifest during development activities.
	Ensuring monitoring of the burial sites in accordance with the scope and procedures contained within this HSMP is implemented through auditing and visual inspections.
Environmental Control Officer	Monitoring of the burial sites in accordance with the scope and procedures contained within this HSMP.
Community Liaison Team	Liaise with affected families when applicable

5.5 Access

The recorded cemeteries and ruins are located within the Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS development area. To give effect to the NHRA requirement to safeguard the cultural significance of burial grounds and graves through sustainable use, the developer will implement actions that will enable access to the burial sites for living heritage purposes.

A suitable access protocol should ensure respectful, controlled, and culturally appropriate access for descendants and stakeholders, the following requirements apply:

- Access to the grave sites must be by prior arrangement and facilitated through the appointed Community Liaison Officer or Site Manager to ensure that visits do not conflict with operational or safety requirements.
- The grave sites should be securely demarcated (adhering to permit requirements) with a clear access gate and signage indicating its significance and access procedures.
- Family members must be allowed periodic supervised visits, particularly during culturally significant periods or for commemorative practices, with provisions for privacy and dignity.
- Ongoing stakeholder engagement, especially with NOK, is essential to assess the adequacy of the arrangements and to ensure that the protocol remains sensitive to evolving cultural needs.
- All visits must be recorded in a visitor log and included in annual heritage monitoring reports submitted to SAHRA.

5.6 Potential risks

This section describes the identified risks and potential impacts to the burial sites and is summarised in Table 7.

This HSMP aims at balancing the preservation of the heritage site in situ against the identified risks and potential impacts. Various preservation mechanisms are identified for implementation.

Table 7. Identified and future risks, potential impacts and assessment

Risk Category	Risk Description	Risk Level	Mitigation Measures	Monitoring/Response	Responsible Party
Physical Damage	Accidental disturbance of graves during construction or maintenance activities	High	Enforce buffer zones; CFP training; Indicate sites on development plans pre-construction	Daily site checks during construction	Site Custodian, Contractor
Unauthorized Access	Trespassing, theft, or vandalism of grave features	Medium	Signage, controlled access system	Monthly inspections, visitor log review	Site Custodian, Security Officer
Grave Erosion or Collapse and Environmental impacts	Natural erosion or soil instability around grave sites, Encroachment by invasive plants or uncontrolled animal access	Medium	Regular maintenance, vegetation management, stormwater diversion	Annual condition assessments	Environmental Officer
Loss of Cultural Knowledge	Lack of community consultation and fading memory of undocumented graves	High	Ongoing oral history documentation, liaison with elders and families	Annual community engagement sessions	Community Liaison
Non-compliance with NHRA	Activities that breach Section 36 protections due to lack of awareness or oversight	High	Staff training, integration of heritage into EMP and contractor induction	Regular audit reporting to SAHRA	Developer, Environmental Manager
Chance Finds During Works	Discovery of unknown graves or features during excavation/ construction	High	Implement Chance Find Procedure	Immediate implementation of Chance Find Protocol	Contractor, Heritage Specialist
Community Conflict	Misunderstanding or disagreement over heritage site use or development plans	Medium	Transparent consultation, clear protocols, representation in decision-making	Documented meetings, grievance mechanism	Community Liaison, Project Manager
Neglect or Mismanagement	Failure to implement HSMP or monitor heritage conditions over time	Medium–High	Assign clear responsibilities; integrate with EMP and project reporting cycles	Annual management review and reporting to SAHRA	Developer, Heritage Consultant

Risk Register Key:

- **High**: Immediate attention required. Could result in irreversible damage or legal penalties.
- **Medium**: Moderate impact; management required to prevent escalation.
- **Low**: Minor risk; monitor periodically.

5.7 Monitoring

Most monitoring activities will be required throughout the construction phase of the development. Where required, external technical specialists must be appointed to comply with the requirements of the HSMP. These requirements must be reviewed in line with any project changes, altered where necessary, and requirements withdrawn where no longer relevant.

Quarterly monitoring can be conducted by the ECO. Monitoring will be conducted pro-actively and reported on in line with SAHRA requirements. Monitoring requirements for the project are summarized in Table 8 and should be implemented together with the specific management actions in Table 7. The Monitoring plan for the project should be revised upon completion of the project and with approval from SAHRA.

Table 8. Monitoring requirements for the cemeteries at Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS

Heritage Monitoring					
Aspect	**Area**	**Responsible for monitoring and measuring**	**Frequency**	**Proactive or reactive measurement**	**Method**
PF002, PF004, PF007, PF008, PF009, PF010, PF011, PF017, PF022, PF024, PF028, PF031, PF033, PF034, PFM001, PFM003, PFM004, PFM008, PFM011	Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS	ECO	Quarterly	Proactively	• Assess current site conditions and compare them with the baseline recorded during the HIA's. • Document site conditions using dated photographic evidence. • Identify and record any signs of degradation, disturbance, or environmental impact. • Maintain monitoring results in a site register for reference and auditing. • Include monitoring findings in regular environmental and heritage progress reports. • Conduct formal annual monitoring by a suitably qualified and accredited archaeologist. • Submit the annual monitoring report to SAHRA for review and noting.

6 EXCLUSIONS AND LIMITATIONS

The following exclusions and limitations apply to this HSMP:

- This HSMP pertains only to known graves and burial sites identified during the heritage impact assessment processes.
- The plan does not include broader cultural heritage resources (e.g., archaeological sites, historical structures, intangible heritage).
- The management of unknown or unmarked graves or burial sites is not directly addressed herein, other than through the Chance Find Protocol.
- The HSMP is based on information available as of the date of the HIAs and any subsequent verification assessments conducted.
- Any new discoveries or changes to grave conditions or contexts made after the finalisation of the HIAs are outside the current scope and will require additional specialist input and/or amendment to this plan.
- The HSMP is limited to compliance with the National Heritage Resources Act, No. 25 of 1999 and does not extend to land use, property rights, or environmental legislation.
- The presence of additional subsurface features; unmarked or unidentified graves cannot be entirely excluded due to the limitations of non-invasive survey methods and the nature of pedestrian surveys.
- Any future requests for access, commemoration, or reburial by descendant communities must be negotiated directly with the landowner and regulatory authority, outside the current scope of this plan.
- The plan does not provide for stakeholder consultation, and this will be facilitated by the EAP or developer if required.
- This plan is intended as a guidance document subject to approval from SAHRA.
- The plan does not absolve the developer or landowner of any legal responsibility or accountability regarding damage to graves or non-compliance with the National Heritage Resources Act.

7 THE WAY FORWARD

Implementation of the HSMP will ensure that the Phefumula Emoyeni One WEF and up to 400kv Grid Connection and MTS development conserves the recorded cemeteries and burial sites. The cemeteries will remain *in situ* within the development area that could potentially be impacted on by long-term, and cumulative impacts caused by development activities. By implementing the mitigation measures in this report, damage to sites will be minimised. Ongoing monitoring of the project will ensure that the grave site is managed in an appropriate manner to protect the integrity of the resources. The HSMP should be implemented together with the EMPr for the project and must be viewed as a dynamic document that should be revised annually.

The HSMP will be publicly available via the SAHRIS portal. Furthermore, awareness of the site will be created through appropriate signage along various access routes and at the cemeteries. Phefumula Emoyeni One (Pty) Ltd aims to maintain *in situ* conservation of the burial sites throughout the Project life and promote the sustainable use thereof via the various measures contained in this HSMP.

8 REFERENCES

Kraljević, L. 2025a. Heritage Impact Assessment for the proposed Phefumula Emoyeni One Up to 400kV Grid Connection and MTS, Mpumalanga

Kraljević , L. 2025b. Heritage Impact Assessment for the proposed Phefumula Emoyeni One Wind Energy Facility (WEF), Mpumalanga

Appendix G

SHUT DOWN ON DEMAND PROTOCOL

Public

Phefumula Emoyeni One Windfarm

Protocol for Implementing Automated Shutdown on Demand (ASDoD) and Observer-led Shutdown on Demand (OSDoD)

June 2025

1. Objective

To prevent avian fatalities caused by turbine collisions through the implementation of Automated Shutdown on Demand (ASDoD) and / or Observer-led Shutdown on Demand (OSDoD) systems in response to the presence of high-risk bird species at the windfarm. This protocol ensures alignment with South African environmental legislation and best practice guidelines.

2. Scope

This protocol applies to all or selected turbines within the windfarm and is focused on the detection and mitigation of collision risks for priority and species of conservation concern as identified by the avifaunal specialist studies and deemed as target species for SDoD.

3. Responsibilities

- Environmental Manager: Oversees programme implementation and reporting.
- Control Room Operators: Monitor real-time system alerts and ensure proper turbine response.
- System Integrator / OEM: Maintains detection systems and shutdown functionality.
- Avifaunal Specialist: Reviews detection data, provides guidance on risk species and implementation of adaptive management.
- Compliance Officer: Ensures legal and permit obligations are met.
- Field Observers: Conduct in-flight monitoring and initiate shutdowns as needed.
- Technical experts: Responsible for remote and or onsite management and maintenance of the ASDoD system.

4. 4. Detection System and Technology

Technology Used:

- AI-assisted visual detection for diurnal detection of target species (e.g., camera-based system capable of detecting and identifying the target species timeously to allow for the shutdown of the respective turbines to prevent collisions).
- Radar-based bird tracking for nocturnal detection, increased range and redundancy of the camera systems being used during the day.

Detection Capabilities:

- Real-time bird tracking at a minimum of 1,500 meters.
- Identification of species, altitude, and flight trajectory.
- Risk classification based on likelihood of collision.

5. Target Species:

The Phefumula Emoyeni One WEF site presents a potential collision risk to the following Target Bird species for which SDoD will be implemented at the site:

Species Name	Scientific Name	Global Conservation Status	Regional Conservation Status
African Marsh Harrier	*Circus ranivorus*	-	EN
Black Harrier	*Circus maurus*	EN	EN
Black Stork	*Ciconia nigra*	-	VU
Black-winged Pratincole	*Glareola nordmanni*	NT	NT
Blue Crane	*Grus paradisea*	VU	NT
Blue Korhaan	*Eupodotis caerulescens*	NT	LC
Cape Vulture	*Gyps coprotheres*	VU	EN
Denham's Bustard	*Neotis denhami*	NT	VU
Greater Flamingo	*Phoenicopterus roseus*	-	NT
Lanner Falcon	*Falco biarmicus*	-	VU
Lesser Flamingo	*Phoeniconaias minor*	NT	NT
Martial Eagle	*Polemaetus bellicosus*	EN	EN
Pallid Harrier	*Circus macrourus*	NT	NT

Species Name	Scientific Name	Global Conservation Status	Regional Conservation Status
Secretarybird	*Sagittarius serpentarius*	EN	VU
Southern Bald Ibis	*Geronticus calvus*	VU	VU

6. Shutdown Protocol

Trigger Conditions:

Target species detected flying toward a turbine within pre-defined risk envelopes which will allow for sufficient time to issue a command and for the turbine to stop. Consequently the risk envelopes may differ depending on the species or the SDoD mechanism used and will be developed in detail during the design and implementation stage.

Automated Shutdown Procedure:

System (camera or radar) sends an automated command to affected turbine(s) based on the detected presence of an approaching target species. The Turbine SCADA system executes a safe stop of the turbine.

Bird flight path is tracked by the system and details recorded on the number of birds that passed through the likely blade swept area. Once the bird or birds have safely vacated the area a command is issued from system for the turbine to be restarted.

Observer-led Shutdown Procedure:

- Observers provide three different warnings to the control room based on the distance of the species to the turbines:
  - Yellow: Bird observed.
  - Orange: Bird flying toward turbines at estimated rotor height.
  - Red: Bird enters species-specific risk zone – Shut down command issued.
- Observers identify turbines to be shut down and order the operator unit to shut down the specified turbines.
- Bird flight path is tracked by the system and details recorded on the number of birds that passed through the likely blade swept area.
- After the collision risk event, observers inform the operation unit to resume operation of the specified turbines.

Fallback Protocol:

- In the event of system failure, pro-active curtailment, visual monitoring and manual shutdown override must be available.

7. Monitoring and Reporting

Data Logging:

- Logs include detection events, turbine shutdowns, duration, restart times as well as birds passing through the Blade swept area while the turbine is off.
- Bird species and behaviour annotated if identifiable.

Monthly Reporting:

- Summary of shutdown events, species involved, turbine IDs, operational impact.
- Submitted to Environmental Manager and included in quarterly environmental reports.

Annual Review:

- Effectiveness evaluated, and adjustments made to sensitivity, shutdown delay, species list, or technology.

8. Maintenance and Testing

- System Calibration: Every 6 months or as required.
- Software Updates: Per vendor recommendation.
- Functional Testing: Biannual simulated shutdowns to verify response time and turbine logic.

9. Community and Stakeholder Engagement

- Annual avifaunal impact summary shared with stakeholders and conservation groups.
- System performance and outcomes presented at annual environmental stakeholder meetings.

10. Continuous Improvement

- Integration with ornithological research and AI model updates.

- Evaluation of complementary bird deterrent methods.
- Collaboration with local experts to refine species-specific risk thresholds.

Appendix H

SECRETARYBIRD PROTOCOL

Public

Appendix K – Secretarybird Mitigation Strategy

Background & Justification

Secretarybirds (*Sagittarius serpentarius*) are large, ground-nesting raptors vulnerable to habitat disturbance and collision risk from wind energy infrastructure. Given their low reproductive rates and territorial fidelity, effective mitigation strategies must be proactive rather than reactive. While Secretarybirds exhibit territorial fidelity, they do not consistently reuse a single nest structure across breeding seasons. Instead, breeding pairs may switch between multiple tree structures within their core territory, utilizing different nest sites over time. This behaviour highlights the importance of monitoring all potential nesting structures within a given territory, rather than focusing on a single nest location. Furthermore, a mitigation strategy would need to account for this in order to be effective.

Our suggested tiered approach (**Figure 1**) provides adaptive management, combining remote sensing, artificial intelligence (AI)-based monitoring, and real-time mitigation actions to minimize potential impacts on breeding Secretarybirds.

The mitigation framework consists of five tiers, from pre-operational site assessments to active curtailment and phased shutdown on demand (SDoD) during confirmed breeding activity.

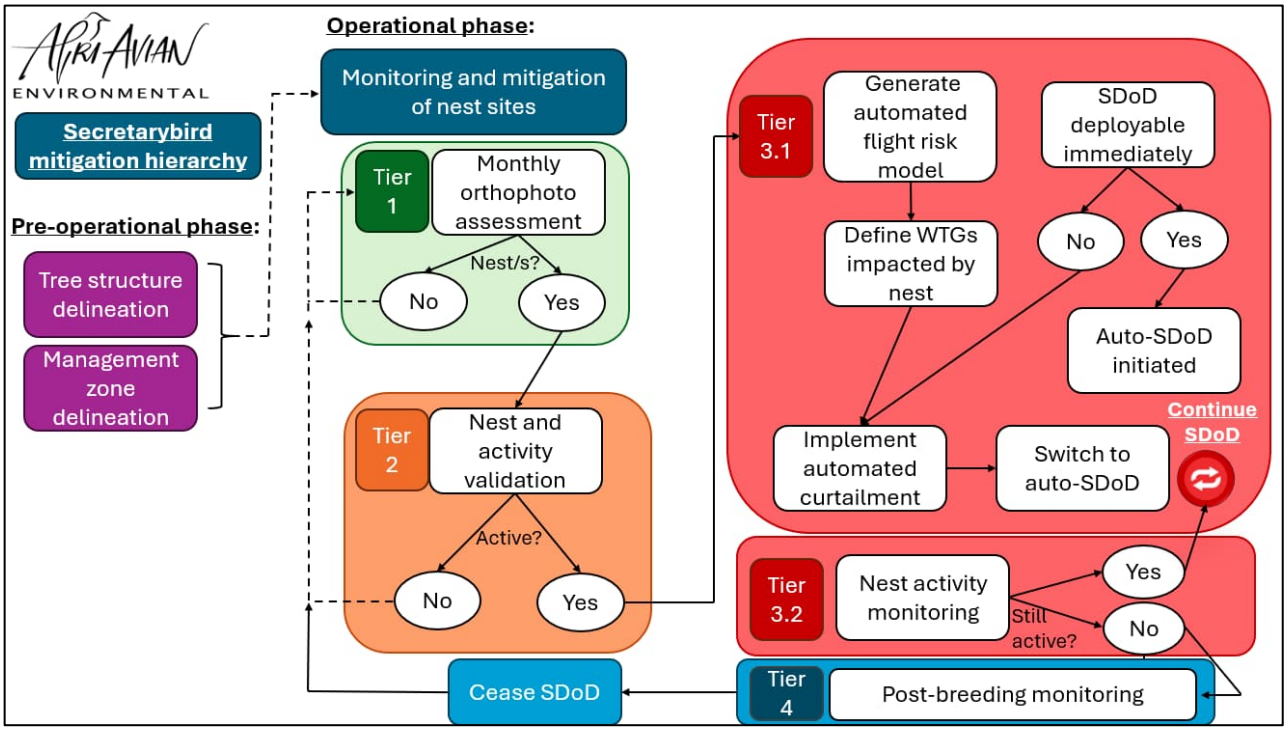


Figure 1: A hierarchal tiered proactive mitigation approach is recommended for Secretarybirds given the observed lack of nest site fidelity. This approach will allow for the identification of any active (new and/or old) nests and mitigate accordingly.

Tier 0: Pre-Operational Assessments

1. Tree Structure Delineation (Nest Habitat Mapping)

Objective: Identify and map all potential nest structures within the Project Area of Influence (PAOI)—including the WEF site and a 3 km buffer—before construction begins.

Methods:

- Canopy Height Model (CHM) generation from LiDAR or high-resolution aerial or satellite imagery.

- Tree structure classification using a trained/developed criteria-based model, which incorporates metrics of tree structure, topography and land-use types of tree structures.
- This training data incorporated a local database of tree structures used for roosting and breeding, with the resultant trained model yielding high precision (0.97) and recall (0.96). As a precautionary approach, lowering the probabilistic threshold used to define suitable tree structures would potentially increase the areas searched during tier 1, but offer greater protection to birds.

2. Management Zone Delineation

Objective: Define Secretarybird Management Zones that integrate:

- Tree structure mapping results (tier 0.1 above).
- Existing nest records (historical or confirmed active nests), as well as prominent roost sites.
- Flight risk model outputs (larger medium-risk areas).

Tier 1: Monthly Orthophoto Monitoring (AI-Based Nest Detection)

Objective: Systematic drone-based monitoring to proactively detect activity at nest and roost structures.

Methods:

- Drone surveys conducted monthly over Management Zones identified in Tier 0.
- Captured high-resolution orthophotos are rapidly processed to detect potential nest and roost structures by the below Nest Detection Model.
- Deep machine learning-Based Nest Detection Model:
- State-of-the-art object detection with high speed & accuracy.
- Trained on an extensive annotated dataset of Secretarybird nest and roost structures.
- Achieves 98% detection accuracy.
- Uses real-time object detection to pinpoint nest structures in the imagery.
- Baseline data collection should begin during the construction phase to inform operational monitoring.
- Results guide Tier 2 validation efforts.

Tier 2: In-Situ Validation of Nesting Activity

Trigger: A nest or frequently used roost structure is identified via drone imagery.

Validation protocol:

- On-site field validation is conducted by an experienced ornithological field specialist.
- Key observations recorded:
- Nest status: Early nest building, incubation, or active chick-rearing.
- Adult behaviour: Courtship displays, nest defence, or feeding interactions.
- Nest usage frequency: To differentiate between roosting sites and active breeding attempts.

Outcome: If breeding activity is confirmed, proceed to Tier 3 for immediate mitigation measures.

Tier 3: Risk Mitigation (Curtailment & SDoD Activation)

Trigger: Confirmed breeding or pre-breeding activity detected in Tier 2 validation.

Immediate Mitigation Actions:

1. Flight Risk Model Application

- Immediate real-time deployment of flight risk model through a respective AfriAvian webapp.
- Determines specific wind turbine generators (WTGs) that pose the highest risk to breeding pairs (nest site).

2. Automated Curtailment of Identified WTGs
   - Immediate response measure—curtailment initiated for all identified high-risk turbines near the nest site.
3. Phased Implementation of SDoD (Shutdown on Demand)
   - Where possible, observer-based or automated (e.g. radar) SDoD is phased in across the respective WTGs.
   - Until full SDoD implementation, curtailment remains in effect to offer protection.
     Objective: Minimize collision risk while maximizing Secretarybird breeding success

Tier 4: Post-Breeding Monitoring & Recovery

Trigger: Breeding activity ceases or concludes (fledged young or nest abandonment).

Validation protocol:

- An experienced ornithologist conducts on-site field validation to confirm post-breeding conditions are met.

Post-Breeding Protocol:

- Curtailment and/or SDoD measures cease.
- Revert to Tier 1 monitoring (monthly drone surveys continue).
- Adjustments to Management Zones if needed (e.g., changes in nest site fidelity, new territory identified, etc.).

Long-Term Impact:

Continuous monitoring and adaptive management ensure that mitigation measures remain effective over consecutive breeding seasons.

Flight Risk Prediction Model for Automated Curtailment (Tier 3, action 2):

1. Background & Justification

Mitigating collision risks for Secretarybirds in wind energy facilities requires a proactive, real-time response system that minimizes risk while maintaining operational efficiency. To support Tier 3 mitigation measures, a Flight Risk Prediction Model was developed to:

- Predict high-risk periods for Secretarybird flight based on weather conditions, time of day, and time of year.
- Trigger automated curtailment of wind turbines near active nests during elevated risk periods.
- Reduce false negatives (missed risky periods) to ensure maximum protection for Secretarybirds.
- This model leverages machine learning to dynamically assess risk in near-real-time using local meteorological data.

2. Model development and training

The Flight Risk Model was trained on an extensive dataset of Secretarybird flight lines, capturing:

- Temporal Flight Patterns: Time of day & time of year influence on flight activity.
- Weather Conditions: Wind speed, wind direction, temperature, and humidity.
- Distance from Nest: Flight probability relative to nest location.
- Topographic: ruggedness and other related metrics.

Model Testing & Selection

A sensitivity analysis was conducted to evaluate multiple classification models. The goal was to minimize false negatives (periods incorrectly predicted as "low risk" when they were actually high-risk), as these could lead to Secretarybirds being exposed to unmitigated collision hazards.

The best-performing model achieved:

- Recall: 84% (high ability to correctly identify risky periods).
- Precision: 72% (moderate ability to avoid false positives).
- Overall Accuracy: 75%

These results indicate strong predictive capability, ensuring that most hazardous flight periods are correctly identified while minimizing unnecessary turbine curtailment.

3. Model Predictions & Risk Temporal Trends

Applying the model to historical flight data revealed that:

- During the peak breeding season, risky periods typically occur in 10–30% of diurnal hours.
- Time of day, wind speed and nest proximity significantly influence risk probabilities.
- By leveraging this predictive framework, mitigation efforts can be strategically optimized, avoiding indiscriminate curtailment while focusing only on periods of elevated risk.

4. Integration with the Mitigation Program

The Flight Risk Model is fully integrated into the Proactive Mitigation Program under Tier 3 (Triggered Curtailment).

Automated Curtailment Process:

1. Weather Data Acquisition: The model retrieves real-time meteorological data from local weather masts via an API connection.
2. Risk Calculation: Based on weather, time of day, and seasonal patterns, the model predicts the probability of Secretarybird flight risk in the immediate period (e.g., next 30–60 minutes).
3. Curtailment Activation: If flight risk exceeds a predefined threshold, a curtailment notification is automatically triggered for high-risk WTGs near the active nest. This notification can be sent to the designated receiver within the control room.
4. Observer or Automated Shutdown on Demand (SDoD): If (or once) available, SDoD is phased in to provide more targeted protection and lowering the shutdown time (i.e. only issue shutdowns when birds fly).

This Flight Risk Prediction Model provides science-driven, near-real-time curtailment activation, ensuring Secretarybirds are protected when flight risk is highest while minimizing unnecessary disruptions to wind farm operations.

Potential future refinements include:

- Expanding the dataset with additional flight observations to improve model robustness.
- Integrating vantage point observations, imaging or radar tracking to enhance validation.
- Adaptive model recalibration based on ongoing flight monitoring data.

By continuously refining and deploying this model, Secretarybird conservation efforts can be proactively strengthened, setting a new standard for avian-wind energy mitigation strategies.

Appendix I

AVIFAUNA MANAGEMENT PLAN

Public

Appendix H – Environmental Management Plan

MANAGEMENT PLAN FOR THE PLANNING AND DESIGN PHASE

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISPLACEMENT DUE TO DISTIURBANCE AND HABITAT TRANSFORMATION					
Displacement of priority avifauna due to disturbance and habitat transformation	Prevent mortality of priority avifauna	1. Restrict construction to the immediate infrastructural footprint. Access to remaining areas should be strictly controlled to minimise disturbance of priority species. This recommendation especially applies within the very high and high sensitivity areas depicted in the sensitivity maps **(Section 5.7 Specialist Sensitivity Analyses and Verification)**. 2. Prioritise upgrading existing roads (where the requisite roads authority permission has been issued) over constructing new roads. 3. Strictly implement the recommendations of ecological and botanical specialists to reduce the level of habitat loss.	Design lay-out around the proposed buffer zones	Once-off during the planning phase.	Project Developer
AVIFAUNA: MORTALITY DUE TO COLLISIONS WITH THE TURBINES					

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
Mortality of priority avifauna due to collisions with the wind turbines	Prevent mortality of priority avifauna	1. No turbines should be constructed in the turbine exclusion buffer zones as indicated in the sensitivity maps (**Section 5.7 Specialist Sensitivity Analyses and Verification**). 2. All wind turbines must have one blade patterned according to a South African Civil Aviation Authority (SACAA) approved pattern to reduce the risk of raptor collisions. All wind turbines must have one blade patterned according to a South African Civil Aviation Authority (SACAA) approved pattern to reduce the risk of raptor collisions. Refer to **Appendix I** for details. 3. It is recommended that all wind turbines (WTGs) be subjected to either Observer-led Shutdown on Demand (OSDoD) or Auto SDoD (ASDoD) during daylight hours and radar flight detection technology for flocks of target species at night. 4. Formal live-bird monitoring should commence following initial turbine operation, as per	Design lay-out around the proposed buffer zones.	1. Once-off during the planning phase. 2. As soon as the first turbines start turning.	Project Developer

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		the Best Practice Guidelines (Jenkins et al. 2015), to determine the extent to which priority species displacement has occurred. Avifaunal monitoring should take place annually for the operational lifespan of the WEF.			

AVIFAUNA: MORTALITY DUE TO ELECTROCUTION					
Electrocution of avifauna on the internal 33kV network	Prevent mortality of priority avifauna	1. All medium voltage cables should be buried as far as practically possible. 2. A raptor-friendly pylon design must be used, and the pylon design must be approved by the avifaunal specialist.	Design engineers to consult with avifaunal specialist on the final design of the poles.	Once-off during the planning phase.	Project Developer

MANAGEMENT PLAN FOR THE CONSTRUCTION PHASE (INCLUDING PRE- AND POST-CONSTRUCTION ACTIVITIES)

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISPLACEMENT DUE TO DISTURBANCE					

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
The noise and movement associated with the construction activities at the development footprint will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of priority avifauna by ensuring that contractors are aware of the requirements of the Construction Environmental Management Programme (CEMPr.)	A site-specific CEMPr must be implemented, which gives appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the CEMPr and should apply good environmental practices during construction. The CEMPr must specifically include the following: 1. No off-road driving. 2. Maximum use of existing roads. 3. Measures to control noise and dust according to latest best practice. 4. Restricted access to the rest of the property. 5. Strict application of all recommendations in the botanical and biodiversity specialist reports pertaining to the limitation and rehabilitation of the footprint.	1. Implementation of the CEMPr. Oversee activities to ensure that the CEMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance. 2. Ensure that construction personnel are made aware of the impacts relating to off-road driving. 3. Construction access roads must be demarcated clearly. Undertake site inspections to verify. 4. Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance. 5. Ensure that the construction area is demarcated clearly and that construction personnel are made aware of these demarcations. Monitor	1. On a daily basis 2. Monthly 3. Monthly 4. Monthly 5. Monthly	1. Contractor and ECO 2. Contractor and ECO 3. Contractor and ECO 4. Contractor and ECO 5. Contractor and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
			via site inspections and report non-compliance.		
AVIFAUNA: DISPLACEMENT DUE TO HABITAT TRANSFORMATION					
Total or partial displacement of avifauna due to habitat transformation associated with the vegetation clearance and the presence of the wind turbines and associated infrastructure.	Prevent unnecessary displacement of avifauna by ensuring that the rehabilitation of transformed areas is implemented according to the recommendations of the biodiversity/vegetation specialist.	1 Ensure that all the recommendations for mitigation from the biodiversity/botanical specialist, including rehabilitation of disturbed areas, are strictly implemented.	1. Appointment of specialist to coordinate and monitor the rehabilitation of the vegetation.	1. Once-off	1. Wind farm operator

AVIFAUNA: MORTALITY DUE TO COLLISIONS ON THE 33KV NETWORK					
Bird collisions with the internal 33kV cables.	Prevent mortality of priority avifauna.	1. Overhead lines should be restricted to an absolute minimum and should only be allowed if underground cabling is unfeasible due technical (not financial) constraints. 2. Bird flight diverters should be installed on all 33kV overhead lines on the full span length on the earthwire (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.	Fit Eskom approved Bird Flight Diverters on the entire overhead section of the 33kV network.	1. Once-off	1. Contractor

MANAGEMENT PLAN FOR THE OPERATIONAL PHASE

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: MORTALITY DUE TO COLLISIONS WITH THE WIND TURBINES					
Bird collisions with the wind turbines	Prevention of priority species collision mortality on the wind turbines.	1. Formal live-bird monitoring and carcass searches should be implemented at the start of the operational phase, as per the most recent edition of the Best Practice Guidelines at the time (Jenkins *et al*. 2015) to assess collision rates. The	1. Appoint Avifaunal Specialist to compile operational monitoring plan, including live bird monitoring and carcass searches. 2. Implement operational monitoring plan.	1. Once-off 2. Years 1, 2, 5 and every five years after that for the duration of the operational lifetime of the facility.	1. Wind farm operator 2. Wind farm operator 3. Wind farm operator 4. Wind farm operator/avifaunal specialist 5. Wind farm operator/avifaunal specialist

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		exact time when operational monitoring should commence, will depend on the construction schedule, and should commence when the first turbines start operating. Avifaunal monitoring should take place annually for the operational lifespan of the WEF. 2. A procedure for the immediate removal of carcasses within the development area must be implemented to prevent vultures from being attracted to the area where they could be at risk of collision with the turbines. 3. It is recommended that all wind turbines (WTGs) to be subjected to either Observer-led Shutdown on Demand (OSDoD) or Auto SDoD (ASDoD) during daylight hours and radar flight detection technology for flocks of target species at night. 4. Furthermore, if annual estimated collision rates of	3. Engage with the landowner to design and implement an effective system to locate a carcass promptly and ensure the immediate removal of the carcass before it can attract vultures. 4. Appoint a team of suitably qualified, trained, dedicated, and resourced team of observers to be present on site for all daylight hours throughout the year. It is absolutely essential that passionate, hardworking staff is hired for this role. This team must be stationed at observation points with full visible coverage of all turbine locations. The observers must detect incoming priority bird species, track their flights, judge when they enter a turbine proximity threshold,	3. Before the first turbines start turning. 4. As and when required, within six months of threshold having been exceeded. 5. Quarterly and annually	

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		other species of conservation concern indicate unsustainable mortality levels of priority species, i.e. if natural background mortality together with the estimated mortality caused by turbine collisions exceeds a critical mortality threshold as determined by the avifaunal specialist in consultation with other experts e.g. BLSA, additional measures will have to be implemented which could include shutdown on demand. This must be undertaken in consultation with a qualified avifaunal specialist.	and alert the control room to shut down the relevant turbine until the risk has reduced. 5. A full detailed method statement must be designed by an avifaunal specialist prior to the commercial operations date (COD) and must be in place by the time that the wind farm starts operating. 6. Compile quarterly and annual progress reports detailing the results of the operational monitoring and progress with any recommended mitigation measures.		
AVIFAUNA: MORTALITY DUE TO ELECTROCUTIONS ON THE 33KV NETWORK/SUBSTATIONS					
Electrocution of priority species on the on-site sub-stations and internal 33kV network	Prevention of electrocution mortality on the overhead sections of the 33kV internal cable network/on-site substation.	1. Conduct regular inspections of the overhead sections of the internal reticulation network to look for carcasses. 2. Apply insulation reactively in the substation if	1. Carcass searchers under the supervision of the Avifaunal Specialist. 2. Design and implement mitigation measures if mortality thresholds are exceeded.	1. At least once every two months. 2. As and when required, within six months of threshold having been exceeded.	1. Operations Manager/Avifaunal specialist 2. Wind farm operator/Avifaunal specialist 3. Wind farm operator/Avifaunal specialist

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		electrocutions of SCC are recorded.	3. Compile quarterly and annual progress reports detailing the results of the operational monitoring and progress with any recommended mitigation measures.	3. Quarterly and annually	

MANAGEMENT PLAN FOR THE DECOMMISSIONING PHASE

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
AVIFAUNA: DISPLACEMENT DUE TO DISTURBANCE ASSOCIATED WITH THE DISMANTLING ACTIVITIES					
The noise and movement associated with the de-commissioning activities at the WEF footprint will be a source of disturbance which would lead to the displacement of avifauna from the area	Prevent unnecessary displacement of avifauna by ensuring that contractors are aware of the requirements of the EMPr.	A site-specific EMPr must be implemented, which gives an appropriate and detailed description of how construction activities must be conducted. All contractors are to adhere to the EMPr and should apply good environmental practice during construction. The EMPr must specifically include the following: 1. No off-road driving. 2. Maximum use of existing roads. 3. Measures to control noise and dust according to latest best practice.	1. Implementation of the EMPr. Oversee activities to ensure that the EMPr is implemented and enforced via site audits and inspections. Report and record any non-compliance. 2. Ensure that construction personnel are made aware of the impacts relating to off-road driving. 3. Access roads must be demarcated clearly. Undertake site inspections to verify.	1. On a daily basis 2. Monthly 3. Monthly 4. Monthly 5. Monthly	1. Contractor and ECO 2. Contractor and ECO 3. Contractor and ECO 4. Contractor and ECO 5. Contractor and ECO 6. Contractor and ECO

Impact	Mitigation/Management Objectives and Outcomes	Mitigation/Management Actions	Monitoring		
			Methodology	***Frequency***	***Responsibility***
		4. Restricted access to the rest of the property. 5. Strict application of all recommendations in the biodiversity/vegetation specialist report pertaining to the limitation of the footprint.	4. Monitor the implementation of noise control mechanisms via site inspections and record and report non-compliance. 5. Ensure that the footprint area is demarcated and that construction personnel are made aware of these demarcations. 6. Monitor via site inspections and report non-compliance.		



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

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