Proposed Sheepmoor Wind Energy Facility and Auxiliary Infrastructure, Mpumalanga

Draft Scoping Report for Public

PREPARED FOR
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0684401

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ACRONYMS AND ABBREVIATIONS

Name	Description
BAR	Basic Assessment Report
BESS	Battery Energy Storage System
CA	Competent Authority
CARA	Conservation of Agricultural Resources, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DRDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
dB	Decibel
DFFE	Department of Forestry, Fisheries and the Environment (National)
DMRE	Department of Mineral Resources and Energy
DoE	Department of Energy
DWS	Department of Water and Sanitation
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 No. 73 of 1989)
EGI	Electricity Grid Infrastructure
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
ESA	Ecological Support Area
ESA	Early Stone Age
ESKOM	Eskom Holdings SOC Limited
EWT	Endangered Wildlife Trust

GNR	Government Notice Regulation
HIA	Heritage Impact Assessment
I&AP	Interested and Affected Party
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IPP	Independent Power Producer
IRP	Integrated Resource Plan
kV	Kilovolt
kWh	Kilowatt Hours
LSA	Late Stone Age
MSA	Middle Stone Age
MW	Megawatt
NCR	Noise Control Regulations
NDP	National Development Plan
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Area
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NPAES	National Protected Area Expansion Strategy
NSD	Noise-sensitive Development
NWA	National Water Act, 1998 (Act No. 36 of 1998)
OES	Ostrich Eggshell
PES	Present Ecological State
PGDS	Provincial Growth and Development Strategy
PPA	Power Purchase Agreement
PPP	Public Participation Process
PSEIA	Plan of Study for the Environmental Impact Assessment
REIPPPP	Renewable Energy Independent Power Producer Procurement Programme
RMPPP	Risk Mitigation Power Procurement Programme
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANRAL	South African National Roads Agency Limited
SANS	South African National Standards
SAWS	South African Weather Service
SCADA	Supervisory Control and Data Acquisition
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SIA	Social Impact Assessment
SR	Scoping Report
SPV	Special Purpose Vehicle
SSV	Site Sensitivity Verification
WEF	Wind Energy Facility
WULA	Water Use License Application
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)

EXECUTIVE SUMMARY

Sheepmoor Wind Energy Facility (Pty) Ltd ('the Project Applicant') is applying for EA to construct and operate the up to 360 MW Sheepmoor Wind Energy Facility (WEF) ('the proposed Sheepmoor WEF') and its auxiliary infrastructure; which includes one on-site substation, with capacity of up to 132 kV, to facilitate the connection between the WEF and the electricity grid. As well as an up to 132 kV over-head powerline of approximately 22.3 km (300 m corridor), traversing sixteen (16) land parcels, be constructed to connect the proposed WEF to the Eskom Uitkoms Substation (refer to FIGURE 1-1). Environmental Resources Management Southern Africa (Pty) Ltd ('ERM') has been appointed to act as the independent Environmental Assessment Practitioner (EAP) to undertake the Scoping and Environmental Impact Assessment (S&EIA) process for EA under Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998 - NEMA) as amended, for the Proposed Development.

SITE LOCATION AND PROPOSED DEVELOPMENT DESCRIPTION

The proposed Sheepmoor WEF is located approximately 30 km east of the town of Ermelo within the Msukaligwa Local Municipality, and Gert Sibande District Municipality, Mpumalanga Province.

The proposed Sheepmoor WEF will consist of the components listed below. It is important to note at the outset that the exact specifications of the project components will be determined during the detailed engineering design phase prior to construction (subsequent to the issuing of an EA, should such an authorisation be granted), but that the information provided below is seen as the worst-case scenario.

- Up to 45 wind turbines, with a maximum hub height of up to 150 m and a rotor diameter of up to 220 m;
- Temporary laydown areas which will accommodate the crane platforms and hardstand laydown area;
- BESS;
- Cabling between the turbines, to be laid underground where practical and feasible;
- One on-site substation with capacity of up to 132 kV to facilitate the connection between the WEF and the electricity grid;
- 132 kV over-head powerline of approximately 22.3 km (300 m corridor);
- Internal roads (existing roads will be upgraded wherever possible);
- A temporary site camp establishment and concrete batching;
- Operation and Maintenance (O&M) buildings; and
- Total permanent development footprint of up to 180 ha after rehabilitation.

The project is expected to have a 30-year life span, but with possible refurbishment this could be extended if deemed feasible at the time.

ENVIRONMENTAL LEGISLATIVE REQUIREMENTS

The EIA Regulations, 2014, published in Government Notice (GN) No. R. 982 as amended provide for the control of certain Listed Activities. These activities are listed in GN No. R. 983 (Listing Notice 1 - Basic Assessment), R. 984 (Listing Notice 2 - Scoping & EIA Process) and R. 985 (Listing Notice 3 - Basic Assessment) of 4 December and are prohibited to proceed until EA has

been obtained from the competent authority, in this case, the Department of Forestry, Fisheries and the Environment (DFFE).

On 7 April 2017; in Government Gazette 40772 the Minister of Environmental Affairs published amendments in Government Notice (GN) Number R. 326 to the Environmental Impact Assessment (EIA) Regulations of 2014 that provide for the control of certain Listed Activities. These activities are listed in Listing Notice 1 (GN R327), Listing Notice 2 (GN R325) and Listing Notice 3 (GN R324). Activities triggered within Listing Notice 1 and 3 require Basic Assessment; activities within Listing Notice 2 require a Scoping & EIA Process.

As the proposed Sheepmoor WEF and associated infrastructure triggers Activities in Listing Notices 1 - 3 and does not fall within a Renewable Energy Development Zone (REDZ), a full Scoping and EIA (S&EIA) process will be followed.

Listed Activities applicable to the proposed Sheepmoor WEF and associated infrastructure are referenced in the table below as well as Table 3.1. All potential impacts associated with these Listed Activities will be considered and assessed in this S&EIA process.

TABLE 0.1: APPLICABLE LISTED ACTIVITIES IN TERMS OF THE NEMA, AS AMENDED

Listing Notice	Activities
LN 1 GN R327[1]	11(i); 12 (ii, a, c); 14; 19; 24 (ii); 27 (i)(ii), 28 (ii); 48 (i)(a, c); and 56 (ii).
LN 2 GN R325[2]	1; and 15.
LN 3 GN R324[3]	4 (f)(i)(bb)(ee); 10(f,i)(bb)(ee); 12(f)(ii); 14(ii)(f)(i)(bb)(ff); 18(f)(i) (bb)(ee); 23 (ii, a, c)(f)(i)(bb)(ee)

Depending on the final design of the Sheepmoor WEF and associated infrastructure, there may be a requirement for the following additional permits / authorisations:

- Biodiversity Permits in terms of the National Environmental Management: Biodiversity Act (Act No 10 of 2004) (NEMBA);
- Waste Management License/s as required by the NEMA, Waste Act, 2008 (Act No. 59 of 2008) as amended;
- Mining Permits as required by the Minerals and Petroleum Resources Development Act, 2002 (MPRDA) (Act No. 28 of 2002) (MPRDA) as amended;
- Water Use Licenses as required by the National Water Act, 1998 (Act No. 36 of 1998) (NWA); and
- Heritage License in term of the National Heritage Resources Act 25 of 1999.

[1] "Listing Notice 1 of the EIA Regulations, promulgated under Government Notice R983 of 4 December 2014, as amended by Government Notice R327 of 7 April 2017."
[2] "Listing Notice 2 of the EIA Regulations, promulgated under Government Notice R984 of 4 December 2014, as amended by Government Notice R325 of 7 April 2017."
[3] "Listing Notice 3 of the EIA Regulations, promulgated under Government Notice R985 of 4 December 2014, as amended by Government Notice R324 of 7 April 2017."

These permits will be applied for should the project be authorised and be selected as a preferred bidder.

AREAS OF INITIAL INVESTIGATION

A number of initial specialist investigations were completed for this Draft Scoping Report (DSR) and their findings are included in this document.

Each of the specialist assessments will follow a systematic approach to the identification and assessment of impacts, with the principal steps being:

- Description of existing environment/baseline conditions;
- Prediction of likely potential impacts, including cumulative impacts (both positive and negative);
- Assessment of likely potential impacts (positive and negative);
- Identification of appropriate mitigation measures; and
- Assessment of residual (potential) environmental impacts.

The individual assessment methodologies and baseline descriptions are set out in this report. The approaches are in line with the legal requirements and industry best practice (IBP) guidelines and makes use of the experience and expertise of the EAP and the specialists.

NEED AND DESIRABILITY

Spatial framework and strategic planning / policy documents that are the most relevant on a national, provincial, metropolitan and local level were reviewed as part of this study. Planning policies are discussed in Section 2 of the Draft Scoping Report (DSR) (this report – Volume I) and in detail in the Specialist Scoping Reports (Volume II).

It is established that policy supports the development of renewable energy at all levels of governance. The intent of local, provincial and national policies is to address energy supply issues and aim to promote economic growth in South Africa.

The EIA Regulations, 2014, as amended, state that the objective of the scoping process includes to, through a consultative process, motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location.

The Guideline for Need and Desirability released by the DFFE in 2017 was used to assess the need and desirability of the proposed Sheepmoor WEF. According to the DFFE guideline[4]: "*Need and desirability is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development – in other words, that a development is ecologically sustainable and socially and economically justifiable – and ensuring the simultaneous achievement of the triple bottom-line.*"

Section 8 of this report describes need and desirability for this development and provides an explanation as to why wind energy can be considered as an alternative to meeting the need for

[4]https://www.dffe.gov.za/sites/default/files/legislations/needanddesirabilityguideline2017_0.pdf

increased electricity demand over other sources of generation such as fossil fuels. Summarily, these reasons include:

- Positive impact on climate change;
- Overcoming the country's energy constraints;
- Diversification and decentralisation of supply;
- Reduced costs of energy; and
- Positive economic development including job creation.

It is the intention of the Project Developer to bid the Sheepmoor WEF in the seventh bidding window of the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP) with the aim of evacuating the generated power from the WEF into the National Eskom Grid. This will aid in the diversification and stabilisation of the country's electricity supply in line with the objectives of the Integrated Resource Plan (IRP).

ALTERNATIVES

The Applicant identified the Sheepmoor WEF after conducting a series of pre-feasibility assessments by considering aspects such as potential wind speed, proximity to the grid connection point, available land, site access and suitable topography. The proposed developable area (the proposed development site) was refined based on these initial feasibility assessments and taking into consideration preconstruction avifaunal and bat monitoring results, which were conducted over a year-long period, reflecting extensive efforts to assess bird and bat populations in the area. The various alternatives considered as part of this Project are detailed in Section 6 of this report.

ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The EIA process is a decision-making tool with the specific aim of selecting an option that will provide an appropriate balance between the benefits of a proposed development and the potential adverse environmental impacts. The EIA process is designed to identify activities which may have a detrimental effect on the environment, and proposed mitigation measures to minimise or eliminate these potential impacts. Should this balance be achieved, the competent authority will issue an EA, with conditions, for the development to proceed. It must be noted that the DFFE have granted permission for the inclusion of the electrical infrastructure into a single application with the Wind Energy Facility, but two Environmental Authorisations (one for the WEF and one for the electrical infrastructure) will be issued if the application is successful.

SCOPING PHASE

The first phase of the EIA process is Scoping. The purpose of the scoping phase is to, through consultation with Interested and Affected Parties (I&APs), determine the extent of the impact assessment, including the potential impacts and issues that must be assessed during the EIA phase. The scoping phase also assesses each alternative (design, technology, location, etc.) of the development, against these potential impacts, to determine the best environmental option for the site to be further assessed during the EIA phase. The scoping phase also determines the methodology and terms of reference for specialist's studies to be undertaken for the proposed development.

This DSR describes the proposed development and includes an assessment of its alternatives. The report documents legal, planning and policy context for the proposed development as a renewable energy development. The baseline environment is described, and potential impacts are predicted. It documents the Scoping Phase public participation process (PPP), noting key stakeholders and it describes the EIA Phase assessment methodologies in the Plan of Study for EIA (PSEIA).

Environmental surveys, on site and desktop-based assessments were initiated and where possible, this survey information is included in the DSR. The DSR will be made available for public comment for the prescribed statutory comment period of 30 days. All comments received in response to the DSR will be tabled and responded to in a Comments and Responses Reports, which will be addressed and submitted with the Final Scoping Report (FSR) and PSEIA to the DFFE, as the competent authority (CA) for approval to mark the end of the Scoping phase.

EIA PHASE

Once the FSR is accepted by the DFFE, the EAP will compile the Draft EIA Report (DEIAr) and Draft Environmental Management Programme (EMPr), which will be made available for public comment for a further period of 30 days. All comments will be considered and incorporated into the Final EIA Report (FEIAr).

The reports will document the assessment of all potential impacts of the proposed development on the existing baseline environment. This will include an assessment of cumulative impacts between the proposed development, and other developments in the area.

Once the FEIAr has been submitted to the DFFE, the DFFE will then issue a decision on whether to grant or refuse EA.

DFFE: INFORMATION REQUIREMENTS FOR WEF APPLICATIONS

The DFFE's requirements for information for all applications for WEFs are included in this section of the report. Where this information is not provided in the tables below, the location of where it can be found in the report is indicated. Should the information not be available at this stage of the EA process (Scoping phase), it is specified that it shall be documented during the EIA phase.

TABLE 0.2: DETAILS OF THE AFFECTED FARM PROPERTIES AND SG 21 CODES

Sheepmoor WEF (West)			
Farm Name	**Farm No.**	**Portion No.**	**SG Code**
Remainder Portion 9 of the Farm Onverwacht No. 273	273	9	T0IT00000000027300009
Portion 10 of the Farm Onverwacht No. 273	273	10	T0IT00000000027300010
Portion 12 of the Farm Onverwacht No. 273	273	12	T0IT00000000027300012

Portion 3 of the Farm Onverwacht No. 273	273	3	T0IT00000000027300003
Portion 6 Of The Farm Onverwacht No. 273	273	6	T0IT00000000027300006
Portion 4 Of The Farm Onverwacht No. 273	273	4	T0IT00000000027300004
Portion 7 Of The Farm Onverwacht No. 273	273	7	T0IT00000000027300007
Portion 2 Of The Farm Onverwacht No. 273	273	2	T0IT00000000027300002
Portion 8 Of The Farm Onverwacht No. 273	273	8	T0IT00000000027300008
Portion 3 Of The Farm Onverwacht No. 287	287	3	T0IT00000000028700003
Onverwacht	287	4	T0IT00000000028700004
Onverwacht	287	5	T0IT00000000028700005
Onverwacht	287	6	T0IT00000000028700006
Waaihoek	286	4	T0IT00000000028600004
Remainder Portion 1 of the Farm Windhoek No. 291	291	1	T0IT00000000029100001
Remainder Portion 8 of the Farm Windhoek No. 291	291	8	T0IT00000000029100008
Sheepmoor WEF Grid Connection			
Portion 7 of the Farm Onverwacht No. 273	273	7	T0IT00000000027300007
Portion 8 of the Farm Onverwacht No. 273	273	8	T0IT00000000027300008
Portion 2 of the Farm Onverwacht No. 287	287	2	T0IT00000000028700002
Portion 4 of the Farm Onverwacht No. 287	287	4	T0IT00000000028700004
Portion 5 of the Farm Onverwacht No. 287	287	5	T0IT00000000028700005
Portion 4 of the Farm Waaihoek No. 286	286	4	T0IT00000000028700004
Portion 6 of the Farm Onverwacht No. 287	287	6	T0IT00000000028700006
Portion 8 of the Farm Windhoek No. 291	291	8	T0IS00000000029100008

Portion 1 of the Farm Windhoek No. 291	291	1	T0IS00000000029100001
	287		
Portion 6 of the Farm Zwartwater No. 288	288	6	
	298	4	
Portion 6 of the Farm Zwartwater No. 288	288	5	T0IT00000000028800005
Portion 1 of the Farm Weltevreden No. 289	289	1	T0IT00000000028900001
Portion 1 of the Farm Weltevreden No. 289	289	5	T0IT00000000028900005
Portion 9 of the Farm Weltevreden No. 289	289	9	T0IT00000000028900009
Remainder of Portion 1 of the Farm Weltevreden No. 289	289	RE/4	T0IT00000000028900004
Portion 16 of the Farm Weltevreden No. 289	289	16	T0IT00000000028900016
Portion 8 of the Farm Weltevreden No. 289	289	8	T0IT00000000028900008
Remainder of Portion 11 of the Farm Mooiplaats No. 290	290	RE/11	T0IT00000000029000011
Portion 10 of the Farm Weltevreden No. 289	290	10	T0IT00000000029000010
Remainder of the Farm Mooiplaats No. 290	290	RE	T0IT00000000029000000
Portion 2 of the Farm Mooiplaats No. 290	290	2	T0IT00000000029000002
Portion 30 of the Farm Witpunt No. 267	267	30	T0IT00000000026700030
Portion 14 of the Farm Mooiplaats No. 290	290	RE/14	T0IT00000000029000014
Remainder of Portion 9 of the Farm Mooiplaats No. 290	290	RE/9	T0IT00000000029000009
Portion 1 of the Farm Mooiplaats No. 290	290	RE/1	T0IT00000000029000001

Portion 3 of the Farm Onverwacht No. 287	287	3	T0IT00000000028700003
Portion 9 of the Farm Zwartwater No. 288	288	9	T0IT00000000028800009
Portion 10 of the Farm Zwartwater No. 288	288	10	T0IT00000000028800010
Zwartwater	288	2	T0IT00000000028800002
Zwartwater	288	1	T0IT00000000028800001
Weltevreden	289	10	T0IT00000000028900010
Weltevreden	289	11	T0IT00000000028900011
Weltevreden	289	6	T0IT00000000028900006
Weltevreden	289	RE/3	T0IT00000000028900003
Witpunt	267	RE/7	T0IT00000000026700007
Mooiplaats	290	7	T0IT00000000029000007
Mooiplaats	290	8	T0IT00000000029000008
Witpunt	267	29	T0IT00000000026700029
Camden Power Station	329	RE	T0IT00000000032900000

TABLE 0.3: GENERAL SITE INFORMATION

General Site Components	Description/Dimensions
Copies of deeds of all affected farm portions	Submitted with the Application Form to the DFFE.
Location of the site	Approximately 30 km east of Ermelo within the Msukaligwa Local Municipality, and Gert Sibande District Municipality.
Facility Area	Approximately 180 hectares. This is the permanent development footprint
Photos of areas that give a visual perspective of all parts of the site	Included in the Visual Scoping Report (Volume II: Specialist Scoping Reports)
Photographs from sensitive visual receptors (tourism routes, tourism facilities, etc.)	Included in the Visual Scoping Report (Volume II: Specialist Scoping Reports)

TABLE 0.4: WEF TECHNICAL DETAILS

Developer / Applicant		Sheepmoor WEF
DFFE Reference		To be confirmed
Site Access		Locality to be confirmed. Total width up to 15 m (12 m after rehabilitation) consisting of up to 3 m width for underground 33 kV reticulation.
WEF Maximum Generation Capacity		Up to 360 MW
Number of Turbines		Up to 45
Hub Height from ground level		Up to 150 m
Blade Length		Up to 110 m
Rotor Diameter		Up to 220 m
Length of internal roads		Unknown at this point.
Width of internal roads		Up to 15 m to be rehabilitated to up to 12 m.
On-site substation capacity		Up to 132 kV
Proximity to grid connection		Approximately 23 km
Grid Connection Capacity		Up to 132 kV
Area occupied by both permanent and construction laydown areas	Temporary turbine construction laydown and storage areas.	Crane platforms and hardstand laydown area up to 45 Ha
	Construction laydown/staging area which will also accommodate the O&M buildings.	Will be located within the permanent footprint area.
	Permanent footprint area dimensions, including roads, turbine hardstand areas, O&M buildings and battery pad.	O&M: Up to 1 Ha Hardstand areas: Up to 1 Ha per WTG Total area of final footprint (including roads): up to 180 Ha
Operations and maintenance buildings (O&M building) with parking area		Up to 1 ha
Height of fencing		2.8 m
Type of fencing		Where site offices are required, temporary screen fencing used to screen offices from the wider landscape.

TABLE 0.5: SITE MAPS AND GIS INFORMATION

Site Maps and GIS Information	Section of this Report
All maps/information layers are provided in ESRI Shapefile format.	
All affected farm portions must be indicated.	FIGURE 1-1: Site Locality Map
The exact site of the application must be indicated (the areas that will be occupied by the application).	FIGURE 1-1: Site Locality Map
A *status quo* map/layer must be provided that includes the following: Current use of land on the site including:	
Buildings and other structures	To be produced during EIA phase
Agricultural fields	To be produced during EIA phase
Grazing areas	To be produced during EIA phase
Natural vegetation areas (natural veld not cultivated for the preceding 10 years) with an indication of the vegetation quality as well as fine scale mapping in respect of Critical Biodiversity Areas and Ecological Support Areas	Figure 6: Preliminary Environmental Constraints Map
Critically endangered and endangered vegetation areas that occur on the site	Figure 6: Preliminary Environmental Constraints Map
Bare areas which may be susceptible to soil erosion	Section 5.5; Section 10.1
Cultural historical sites and elements	Section 5.11
Rivers, streams and water courses	Section 5.6
Ridgelines and 20 m continuous contours with height references in the GIS database	Volume II: Specialist Scoping Reports
Fountains, boreholes, dams (in-stream as well as off-stream) and reservoirs	To be produced during EIA phase
High potential agricultural areas as defined by the Department of Agriculture, Forestry and Fisheries	Screening Tool Report in Volume II
Buffer zones (also where it is dictated by elements outside the site): 500 m from any irrigated agricultural land 1 km from residential areas	To be produced during EIA phase
Indicate isolated residential, tourism facilities on or within 1 km of the site	To be produced during EIA phase
A slope analysis map/layer that include the following slope ranges: Less than 8% slope (preferred areas for turbines and infrastructure) Between 8% and 12% slope (potentially sensitive to turbines and infrastructure) Between 12%and 14% slope (highly sensitive to turbines and infrastructure)	To be produced during EIA phase

Steeper than 18% slope (unsuitable for turbines and infrastructure)	
A map/layer that indicate locations of birds and bats including roosting and foraging areas	Birds and Bat Studies I Volume II: Specialist Scoping Reports
A site development proposal map(s)/layer(s) that indicate: Turbine positions Foundation footprint Permanent laydown area footprint Construction period laydown footprint Internal roads indicating width (construction period width and operation period width) and with numbered sections between the other site elements which they serve (to make commenting on sections possible).	Figure 1-2
River, stream and water crossing of roads and cables indicating the type of bridging structures that will be used.	To be produced during EIA phase
Substation(s) and/or transformer(s) sites including their entire footprint.	Figure 1-2
Cable routes and trench dimensions (where they are not along internal roads) Connection routes to the distribution/transmission network (the connection must form part of the EIA even if the construction and maintenance thereof will be done by another entity such as ESKOM).	To be produced during EIA phase
Cut and fill areas at turbine sites along roads and at substation/transformer sites indicating the expected volume of each cut and fill	To be produced during EIA phase
Borrow pits	To be produced during EIA phase
Spoil heaps (temporary for topsoil and subsoil and permanently for excess material) Buildings including accommodation	To be produced during EIA phase

TABLE 0.6: DEVELOPMENT AREA GEOGRAPHIC COORDINATES - SHEEPMOOR WEF

Proposed Sheepmoor WEF Site Boundary and Associated Infrastructure		
Aspect	Latitude	Longitude
North East Corner	26°33'49.87"S	30°18'24.83"E
East Corner	26°37'32.85"S	30°17'51.58"E
South East Corner	26°41'15.89"S	30°14'50.39"E
South West Corner	26°40'20.40"S	30°13'48.39"E
West Corner	26°36'20.85"S	30°15'20.26"E

North West Corner	26°33'1.75"S	30°16'16.94"E
Facility Substation	26°36'36.42"S	30°16'38.44"E
Laydown Area	26°36'43.84"S	30°16'24.11"E
Facility Substation (Alternative 1)		
Centre Point	26°34'28.80"S	30°17'44.39"E
Laydown Area (Alternative 1)		
Centre Point	26°34'14.55"S	30°17'46.34"E30° 17.758’
Grid Connection Infrastructure (Preferred)		
Start Point	26°36'37.20"S	30°16'31.79"E
Point 1	26°36'42.92"S	30°14'8.48"E
Point 2	26°39'16.12"S	30°13'10.03"E
Point 3	26°38'19.12"S	30° 7'35.69"E
Point 4	26°37'55.96"S	30° 6'35.38"E
End Point	26°37'10.09"S	30° 5'49.81"E
Grid Connection Infrastructure (Alternative 1)		
Start Point	26°36'37.20"S	30°16'31.79"E
Point 1	26°36'42.92"S	30°14'8.48"E
Point 2	26°39'39.05"S	30°12'58.75"E
Point 3	26°39'0.48"S	30° 9'20.28"E
Point 4	26°37'57.55"S	30° 6'28.12"E
End Point	26°38'43.21"S	30° 4'7.93"E
Grid Connection Infrastructure (Alternative 2)		
Start Point	26°36'37.20"S	30°16'31.79"E
Point 1	26°39'50.39"S	30°15'35.72"E

Point 2	26°39'57.95"S	30° 8'49.12"E
End Point	26°38'44.16"S	30° 4'5.86"E
Grid Connection Infrastructure (Alternative 3)		
Start Point	26°36'37.20"S	30°16'31.79"E
Point 1	26°34'0.53"S	30°14'50.16"E
Point 2	26°34'28.46"S	30°10'31.80"E
Point 3	26°34'16.47"S	30° 9'48.09"E
Point 4	26°34'19.51"S	30° 9'9.75"E
Point 5	26°35'15.84"S	30° 8'55.57"E
Point 6	26°35'24.21"S	30° 8'24.75"E
Point 7	26°35'22.96"S	30° 7'45.70"E
Point 8	26°36'55.57"S	30° 6'22.18"
End Point	26°36'57.50"S	30° 5'46.48"E

Please refer to Figure 1-1 and Figure 1-2 for the proposed location and the preliminary site development plan, respectively.

SPECIALIST INVESTIGATION

Studies including soil, land and agricultural potential, aquatic / freshwater, terrestrial ecology (flora and fauna), avifauna, bats, visual / landscape, heritage and archaeology, palaeontology, noise, socio-economic and traffic and transportation have been completed and / or is underway to quantify possible impacts and magnitude of impacts.

SUMMARY OF FINDINGS

The DSR has captured the key and/or scoped issues and impacts for this proposed development by taking into account the findings of the specialists' scoping reports. The specialist reports document anticipated environmental impacts that may be experienced within both the biophysical and social environments.

It is the opinion of the EAP based on the assessments undertaken thus far that the application can proceed to the EIA phase and the scoping report can be accepted by the DFFE.

1. INTRODUCTION

1.1 PROJECT OVERVIEW

Sheepmoor Wind Energy Facility (Pty) Ltd ('the Project Applicant') is applying for EA to construct and operate the up to 360 MW Sheepmoor Wind Energy Facility (WEF) ('the proposed Sheepmoor WEF') and its auxiliary infrastructure; which includes one on-site substation, with capacity of up to 132 kV, to facilitate the connection between the WEF and the electricity grid. As well as an up to 132 kV over-head powerline of approximately 22.3 km (300 m corridor), traversing sixteen (16) land parcels, be constructed to connect the proposed WEF to the Eskom Uitkoms Substation (refer to FIGURE 1-1).

The proposed development is located approximately 30 km east of Ermelo, within the Msukaligwa Local Municipality, and Gert Sibande District Municipality.

The Project Applicant appointed Environmental Resources Management Southern Africa (Pty) Ltd (ERM), to act as the Environmental Assessment Practitioner (EAP) and to undertake the Scoping and Environmental Impact Assessment (S&EIA) process for EA; in line with Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998 – NEMA), and the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended). It must be noted that the DFFE have granted permission for the inclusion of the electrical infrastructure into a single application with the Wind Energy Facility, but two Environmental Authorisations (one for the WEF and one for the electrical infrastructure) will be issued if the application is successful.

1.2 PURPOSE AND AIM OF THE SCOPING REPORT

This DSR aims to present and assess the baseline environment as well as the initial proposed site development plan. While a preliminary turbine layout has been provided in Figure 1-2 the precise location of each turbine and associated infrastructure has not been finalised and will be determined based on the findings of the various specialist's assessments as well as other technical and financial constraints for this proposed development. The site development plan will continue to be refined through an iterative process taking into considering specialists' findings.

FIGURE 1-1 LOCALITY MAP

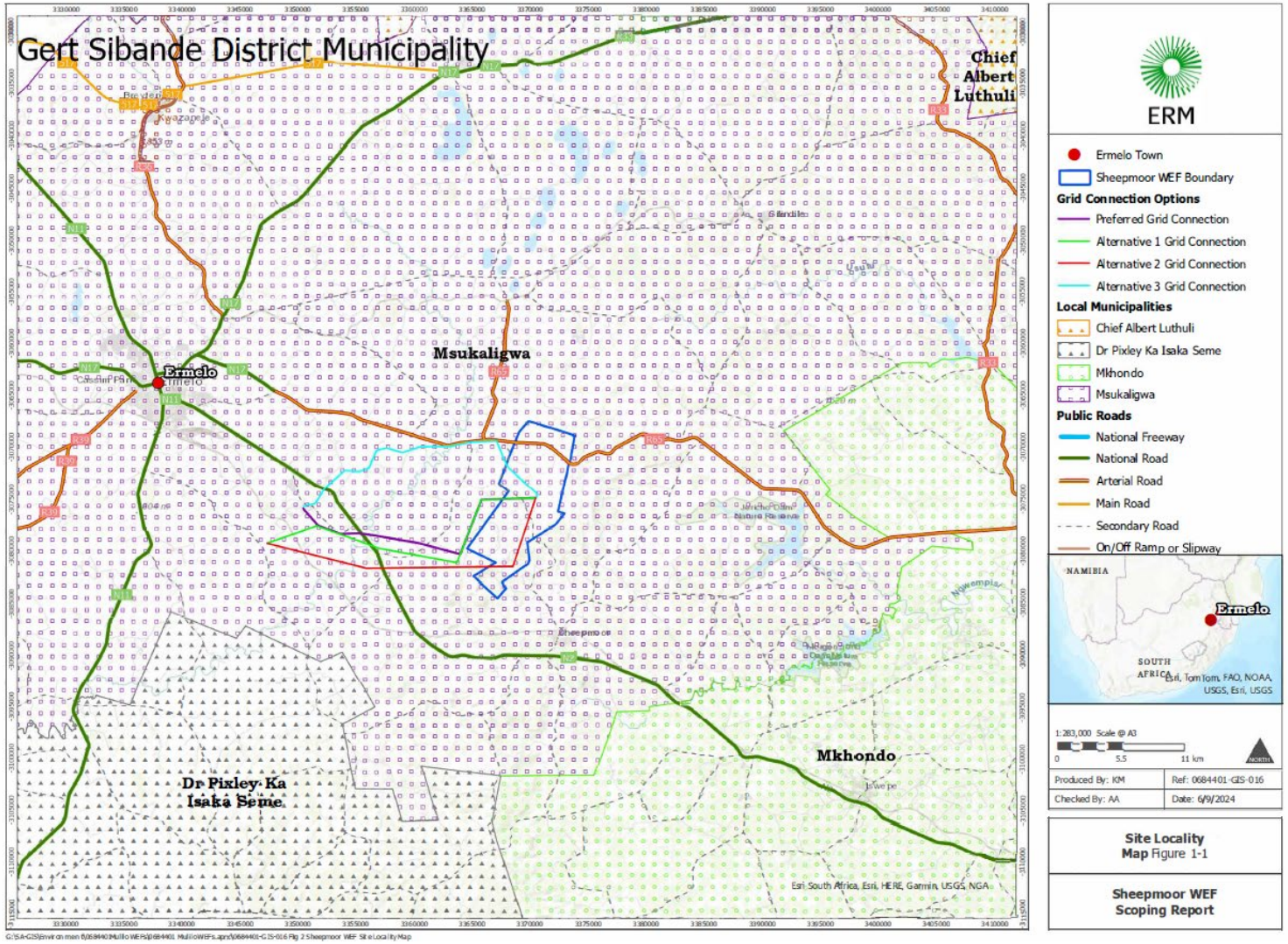
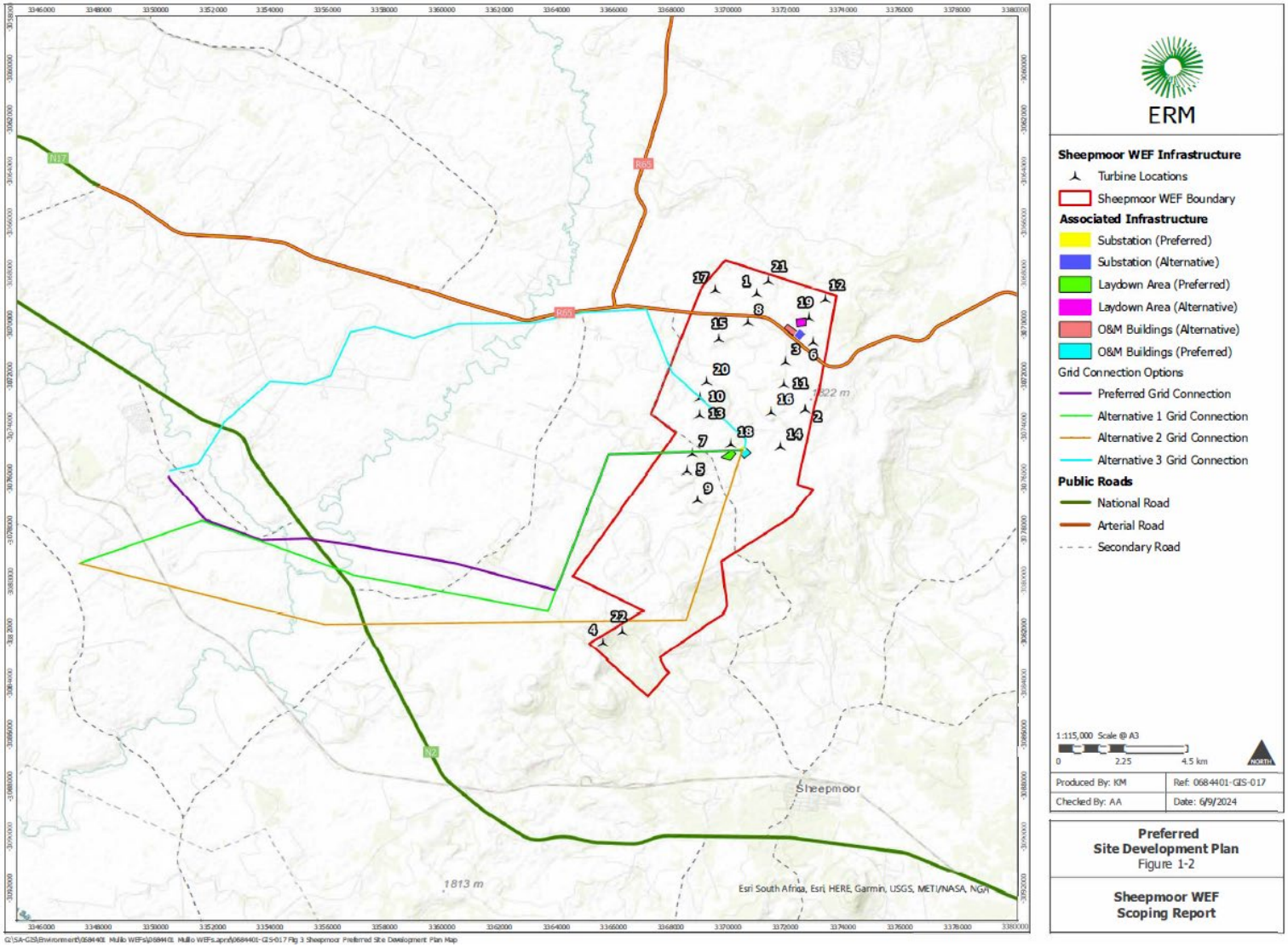


FIGURE 1-2 PRELIMINARY SITE LAYOUT PLAN



2. TERMS OF REFERENCE

The primary objective of the Scoping process is to present sufficient information to the competent authority (CA) and I&APs on predicted potential impacts and develop the plan of study for the EIA.

The NEMA EIA Regulations 2014, as amended in 2017[5], regulate and prescribe the content of the Scoping Report (SR) and specify the type of supporting information that must accompany the submission of the report to the authorities. Table 2.1 shows how and where the legal requirements are addressed in this Draft Scoping Report. Section 9 of this SR provides a summary of the Public Participation Process (PPP), and the final SR will contain the Public Participation undertaken to date. As comments are received on the SR these will be collated and included in the final SR.

As per the EIA Regulations 2014, as amended, "*the objective of the scoping process is to, through a consultative process-*

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

The above activities are completed through consultation with:

- The lead authorities involved in the decision-making for the application (in this case, the Department of Forestry, Fisheries and the Environment (DFFE) for the WEF and the the grid connection);
- I&APs, provincial and local governments, and other relevant organisations to ensure that local issues are well understood; and

[5] Hereafter referred to as EIA Regulations 2014, as amended.

- The specialist team to ensure that technical issues are identified.

The existing environment within which a proposed development is to be located is investigated, through a review of relevant background literature and ground-truthing and any required long-term on-site monitoring.

A primary objective is to present key stakeholders with the findings of the assessments, obtain and document feedback and address all issues raised.

TABLE 2.1: LEGISLATIVE REQUIREMENTS FOR SCOPE OF ASSESSMENT AND CONTENT OF THE SCOPING REPORT

Appendix 2 Requirements NEMA, 1998 (Act No. 107 of 1998)		**Location in SR**
2 (1)	*A scoping report must information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include-*	
(a)	*details of-* *i. the EAP who prepared the report; and* ii. *the expertise of the EAP, including a curriculum vitae;*	Section 2.2 and Appendix A
(b)	*the location of the activity, including-* *i. the 21 digit Surveyor General code of each cadastral land parcel;* *ii. where available, the physical address and farm name;* *iii. where the required information in items (i) and (ii) is not available, the co-ordinates of the boundary of the property or properties;*	Executive Summary
(c)	*a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is-* *i. a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or* *ii. on land where the property has not been defined, the coordinates within which the activity is to be undertaken;*	Figure 1-1 – Site Locality Map
(d)	*a description of the scope of the proposed activity, including-* *i. all listed and specified activities triggered;* *ii. a description of the activities to be undertaken, including associated structures and infrastructure;*	Table 3.1 Section 7
(e)	*a description of the policy and legislative context within which the development is proposed, including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;*	Section 3
(f)	*a motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;*	Section 8

(g)	*a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including-* *i. details of the alternatives considered;*	Section 6 - 8
	ii. details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs;	Section 9
	iii. a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 9
	iv. the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 5
	v. the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts- *(aa) can be reversed;* *(bb) may cause irreplaceable loss of resources; and* *(cc) can be avoided, managed or mitigated;*	Section 10 - 11
	vi. the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 4
	vii. positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 10 - 11
	viii. the possible mitigation measures that could be applied and level of residual risk;	Section 10 - 11
	ix. the outcome of the site selection matrix;	Section 5 – 11
	x. if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Section 6
	xi. a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 12
(h)	*a plan of study for undertaking the environmental impact assessment process to be undertaken, including -* *i. a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;* *ii. aspects to be assessed by specialists;* *iii. a description of the proposed method of assessing the environmental aspects, including a description of*	Section 12

	the proposed method of assessing the environmental aspects including aspects to be assessed by specialists; *iv. a description of the proposed method of assessing duration and significance;* *v. an indication of the stages at which the competent authority will be consulted;* *vi. particulars of the public participation process that will be conducted during the environmental impact assessment process; and* *vii. a description of the tasks that will be undertaken as part of the environmental impact assessment process;* *viii. identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.*	
(i)	*an undertaking under oath or affirmation by the EAP in relation to-* *i. the correctness of the information provided in the report;* *ii. the inclusion of comments and inputs from stakeholders and interested and affected parties; and* *iii. any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;*	Appendix A
(j)	*an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;*	Appendix A
(k)	*where applicable, any specific information required by the competent authority; and*	n/a
(l)	*any other matters required in terms of section 24(4)(a) and (b) of the Act.*	n/a
2 (2)	*Where a government notice gazetted by the Minister provides for any protocol or minimum information requirement to be applied to a scoping report, the requirements as indicated in such notice will apply.*	Section 3

2.1 STRUCTURE OF THE SCOPING REPORT

The application for EA and assessment of impacts is ultimately a decision-making process with the specific aim of selecting an option that is technically feasible, practical, and will cause the least impact to the environment. The SR contains the following information:

- Nature of the activity;
- Need and desirability of the proposed development;
- Description of the receiving environment;
- Identification of potential feasible alternatives;
- Identification of potential positive and negative impacts;

- Identification of knowledge gaps; and
- A Plan of Study for the EIA phase.

The SR also contains the Plan of Study for the EIA Phase (PSEIA). This plan sets out the proposed approach to the EIA Phase study including the:

- Tasks that will be undertaken, including specialist reports and the manner in which such tasks will be completed;
- Stages at which the CA will be consulted; and
- Description of the methods of assessment and the details of the PPP.
    - The Scoping Report is set out in two volumes:
    - Volume I: Scoping Report
    - Volume II: Specialist Scoping Reports

The independent environmental assessment practitioner (EAP) and specific specialists identified potential negative and positive impacts that could arise as a result of the proposed development and the PSEIA has been developed. The appointment of specialists was made based on the list of specialists identified by the Screening Report (see Volume II) generated for the proposed development on the DFFE Screening Tool Portal. The structure of the report is provided in Table 2.2 below.

TABLE 2.2: STRUCTURE OF THIS SCOPING REPORT

Section	Title	Containing
Volume I: Scoping Report		**Assessment of the Proposed Development**
-	Executive Summary	Summary of the Project Specifications, Listed Activities, Specialist Investigations and Findings.
1	Introduction	Project Introduction, and Purpose and Aim of the Report.
2	Terms of Reference	Structure of the SR, Project Team Details, and Assumptions and Limitations of the Study.
3	Environmental Legal Framework	National Environmental Legislation, Applicable Acts, International Conventions and Treaties, Policies and Guidelines.
4	Scope of Work and Scoping Phase Methodology	Environmental Screening Tool Results, Specialists Studies Methodology, Assessment Techniques for the S&EIA.
5	Description of the Baseline Environment	A Description of the Receiving Environment.
6	Assessment of Alternatives	No-Go, Site Selection, Design Evolution and Technology Alternatives.
7	The Preferred Alternative	Description of the Preferred Proposed Development, including a description of the location, technical specifications and components.
8	Need and Desirability	Brief description of the Need and Desirability of the Proposed Development.

9	Public Participation Process	Initial and Scoping Phase - Public Participation Process, Summary of Issues.
10	Assessment of Potential Impacts	An Assessment of the Potential Impacts during the Construction, Operational and Decommissioning Phases.
11	Assessment of Cumulative Impacts	An Assessment of the Potential Cumulative Impacts.
12	Summary of Findings	A Summary of the Findings.
13	Plan of Study for EIA	Documents aspects requiring further assessment and the assessment methods proposed for the EIA Phase.
Appendix A	EAP Declaration of Independence and CV	EAP Commissioner of Oaths Declaration of Independence and CV.
Volume II: Specialist Scoping Reports		Respective Specialist Scoping Reports: • Soil and Agricultural Potential • Aquatic • Terrestrial Biodiversity and Plant • Animal Species • Avifauna • Bats • Visual / Landscape and Flicker • Heritage, Archaeology and Palaeontology • Noise • Socio-Economic • Traffic and Transportation
Appendix A		Screening Tool Report

2.2 PROJECT TEAM DETAILS

The Applicant, Sheepmoor Wind Energy Facility (Pty) Ltd, appointed ERM, with the lead EAP being Stephanie Gopaul to co-ordinate and manage the S&EIA application process. The appointed specialist team was based on the results of the DFFE Screening Tool Report generated.

TABLE 2.3: DETAILS OF THE APPLICANT

Name of the Applicant	Sheepmoor Wind Energy Facility (Pty) Ltd		
Name of contact person for applicant (if other)	Andrew Pearson		
Company Registration Number	2021/770267/07		
BBBEE status	Level 4		
Physical address	Portside, 5 Buitengracht St, Cape Town, 8001		
Postal address	PO Box 548 Howard Place		
Postal code	7450	Cell:	072 796 7733
Telephone	0216853240	Fax:	-
E-mail	Andrew@mulilo.com		

TABLE 2.4: DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

Name of the EAP organisation	Environmental Resource Management Southern Africa (Pty) Ltd		
Environmental Assessment Practitioner	Stephanie Gopaul		
Consultant	Lucien Barbeau		
Postal address	240 Main Road, Great Westerford Building, 1st Floor, Rondebosch, Cape Town		
Telephone	+27105963502	Postal Code:	7700
Cellular	+27 (0)76 340 8914	Fax:	(-) -
E-mail	ERM.ArcusAmsterdam@erm.com		
EAP Qualifications	• Masters in Environmental Management, University of the Free State, South Africa, 2012 • BSc. Environmental and Engineering Geology, University of KwaZulu Natal, South Africa, 2005		

Refer to Appendix A for the EAP's Declaration of Interest and Curriculum Vitae

TABLE 2.5: S&EIA PROJECT TEAM

Discipline	Specialist	Specialist Organisation
Consultant	Lucien Barbeau	ERM SA (Pty) Ltd
Soil and Agricultural Potential	Johann Lanz	Independent Consultant
Aquatic	Dr Brian Colloty	EnviroSci. Pty Ltd
Terrestrial Biodiversity and Plant	Jamie Pote	Independent Consultant
Animal Species	Jonathan Colville	Terrestrial Ecologist & Faunal Surveys
Avifauna	Albert Froneman	AfriAvian Environmental
Bats	Jonathan Aronson	Camissa Sustainability Consulting
Visual / Landscape and Flicker	Graham Young	Graham Young Landscape Architect
Heritage, Archaeology and Palaeontology	Gavin Anderson	UMLANDO: Archaeological Surveys & Heritage Management
Noise	Morné de Jager	Enviro Acoustic Research
Socio-Economic	Tony Barbour	Independent Consultant
Traffic and Transportation	Reabetswe Mokomele	SMEC South Africa

2.3 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations are applicable:

- The assumption is made that the information on which this report is based (baseline studies and project information, as well as existing information) is accurate and correct.
- It is assumed that the information contained in the Screening Tool Reports generated are accurate and correct and valid at the time of preparing this report.
- The project description information provided is preliminary and will require further detailed investigation, which will form part of the subsequent stages of this EIA process. Statements or indicators of significance in this report must be considered considering the uncertainty regarding the exact extent and significance of resources on the site at this stage of the process.
- The general location of the proposed wind turbines, maximum extent of access roads, and the connection of routings have been indicated. The actual position of each wind turbine will be determined by the outcome of the EIA process, as will the exact location of the proposed O&M buildings.
- With respect to specialist assessments, most have assumed that the issues identified are likely to be similar to other proposed WEF projects in the area, and desktop surveys and site visits have been carried out for the Scoping Phase of this EIA. Specialist site visits, and modelling has been undertaken and should further visits be required these will inform the EIA phase of the application process.
- The assumptions and limitations, presented in each specialist report, Volume II of this report, are noted.
- The developments to be included in the cumulative assessment is based on available public information, the most current DFFE database of renewable applications (at the time of writing the report, REEA_OR_2023_Q4.shp[6]), and if the applicant has submitted an application for EA.
- It is assumed that the PSEIA phase will be accepted and approved.

[6] South African Renewable Energy EIA Application Database (http://egis.environment.gov.za/frontpage.aspx?m=27).

3. ENVIRONMENTAL LEGAL FRAMEWORK

The proposed development requires EA prior to being constructed and operated. This section of the report highlights the important environmental legal considering during the S&EIA process.

3.1 THE NATIONAL ENVIRONMENT MANAGEMENT ACT, 1998 (ACT NO 107 OF 1998)

Section 2 of the National Environment Management Act, 1998 (NEMA) as amended, lists environmental principles that are to be applied by all organs of state regarding developments that may significantly affect the environment. Included amongst the key principles is the principle that all developments must be socially, economically and environmentally sustainable, and environmental management must place people and their needs at the forefront of its concern, to serve their physical, psychological, developmental, cultural and social interests equitably.

NEMA, as amended, also provides for the participation of potential and registered I&APs and it stipulates that decisions must take the interests, needs and values of all I&APs into account.

Chapter 5 of NEMA, as amended, outlines the general objectives and implementation of Integrated Environmental Management (IEM), the latter providing a framework for the integration of environmental issues into the planning, design, decision-making and implementation of plans and development proposals. Section 24 provides a framework for the granting of EAs.

To give effect to the general objectives of IEM, the potential impacts on the environment of listed activities must be considered, investigated, assessed and reported to the competent authority. Section 24(4) outlines the minimum requirements for procedures for the investigation, assessment and communication of the potential impact of activities.

3.2 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REGULATIONS, 2014 AS AMENDED

The EIA Regulations 2014 as amended by GNR 326 of 2017 provide for the control of certain Listed Activities. These activities are listed in Government Notice No. R327 (Listing Notice 1 – Basic Assessment), R325 (Listing Notice 2 – Scoping & EIA Process) and R324 (Listing Notice 3 – Basic Assessment) of 7 April 2017, and are prohibited to commence until EA has been obtained from the competent authority, in this case, the Department of Forestry and Fisheries (DFFE).

The DFFE is the competent authority for all renewable energy proposals which will be bid into the Renewable Energy Independent Power Producer Procurement Programme (REIPPPP), as NEMA, as amended, states that:

"24C. (2) The Minister must be identified as the competent authority in terms of subsection (1) if the activity- (a) has implications for international environmental commitments or Relations"

EA, which may be granted subject to conditions, will only be considered upon compliance with GNR982, as amended by GNR326 of 7 April 2017.

Any EA obtained from the DFFE applies only to those specific listed activities for which the application was made. To ensure that all Listed Activities that could potentially be applicable to this proposal are covered by the EA, a precautionary approach is followed when identifying listed activities, that is, if an activity could potentially be part of the proposed development, it is listed.

The Listed Activities applicable to this proposed project are presented in Table 3.1 below. All potential impacts associated with these Listed Activities will be considered and adequately assessed in this authorisation process.

TABLE 3.1: NEMA LISTED ACTIVITIES APPLICABLE TO THE SHEEPMOOR WEF

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended in 2017.	Describe the portion of the proposed project to which the applicable listed activity relates.
Listing Notice 1 GN R 327 Activity 11	*The development of facilities or infrastructure for the transmission and distribution of electricity— (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts.*	The facility will include the construction of one onsite substation and 132 kV overhead transmission powerline to facilitate the connection between the WEF and the national grid. The facility will be constructed across various farm portions outside urban areas.
Listing Notice 1 GN R 327 Activity 12	*The development of— (ii) infrastructure or structures with a physical footprint of 100 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;*	The facility will entail the construction of built infrastructure and structures (such as wind turbines, hardstands, offices, workshops, O&M buildings, ablution facilities, onsite substations, laydown areas and security enclosures etc.). The infrastructure and structures are expected to exceed a footprint of 100 m^2 and some may occur within small drainage features and 32 m of the watercourses.
Listing Notice 1 GN R 327 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 meters or more but not exceeding 500 cubic meters.*	Construction of the facility will require dangerous goods in the form of hydrocarbon fuels (e.g., diesel), paints and solvents, oils and greases. Sewage and waste streams will be generated by the WEF. During construction of the WEF, the combined capacity of dangerous goods on site will exceed 80 m^3. The proposed on-site substation is likely to require the use of transformer oils/other hazardous substances during the operational phase.
Listing Notice 1 GN R 327	*The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation,*	The facility will entail the excavation, removal and moving of more than 10 m^3 of soil, sand, pebbles, or rock from

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended in 2017.	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity 19	*removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse;*	nearby watercourses on site, mainly for the purpose of constructing access roads.
Listing Notice 1 GN R 327 Activity 24	*The development of a road—* *(ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;*	Roads with a reserve wider than 13.5 meters are proposed for the facility. As required by Eskom, a service and maintenance road of 8m wide is required to be constructed underneath the OHL, for construction and maintenance purposes.
Listing Notice 1 GN R 327 Activity 27	*The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for -* *the undertaking of a linear activity; or maintenance purposes undertaken in accordance with a maintenance management plan.*	The facility will entail the construction of infrastructure with a combined physical footprint of more than 1 ha that will require clearance of indigenous vegetation.
Listing Notice 1 GN R 327 Activity 28	*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.*	The facility will take place outside of an urban area and across several adjoining farm portions and will have an estimated total development footprint of more than 20 ha.
Listing Notice 1 GN R 327 Activity 48	*The expansion of* *(i) infrastructure or structures where the physical footprint is expanded by 100 square metre or more,* *Where such expansion occurs within a watercourse; and* *(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.*	The facility will require the upgrading of existing roads within the project area, as well as watercourse crossing upgrades, where such upgrades may take place within watercourses and within 32 m from the edge of these watercourses. The total footprint of the upgrades to be undertaken on the existing roads would be more than 100 m^2 within a watercourse, or within 32 m of a watercourse.
Listing Notice 1 GN R 327 Activity 56	*The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre-* *(ii) where no reserve exists, where the existing road is wider than 8 metres;*	Existing farm access roads will be widened or lengthened. These roads would currently have no road reserve and will be wider than 8 meters in some areas during construction phase of the development.
Listing Notice 2 GN R 325	*The development of facilities or infrastructure for the generation of electricity from a renewable resource*	The WEF will have a total generation capacity output of more than 20 MW.

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended in 2017.	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity 1	*where the electricity output is 20 megawatts or more*	The facility is not situated within a REDZ or a strategic power corridor. A full S&EIA process will be undertaken.
Listing Notice 2 GN R 325 Activity 15	*The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-* *the undertaking of a linear activity;* *maintenance purposes undertaken in accordance with a maintenance management plan.*	The total development footprint of the facility is expected to be more than 20 ha. As a result, more than 20 ha of indigenous vegetation may be removed for the construction of the proposed projects.
Listing Notice 3 GN R 324 Activity 4	*The development of a road wider than 4 metres with a reserve less than 13,5 metres.* *f. Mpumalanga* *i. Outside urban areas:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Roads with a reserve wider than 4 meters are proposed for the facility. As required by Eskom, a service and maintenance road of 8m wide is required to be constructed underneath the OHL, for construction and maintenance purposes.
Listing Notice 3 GN R 324 Activity 10	*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:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Construction of the facility will require dangerous goods in the form of hydrocarbon fuels (e.g., diesel), paints and solvents, oils and greases. Sewage and waste streams will be generated by the WEF. During construction of the WEF, the combined capacity of dangerous goods on site will not exceed 80 m^3. The proposed on-site substation is likely to require the use of transformer oils/other hazardous substances during the operational phase.
Listing Notice 3 GN R324 Activity 12	*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* *ii. Within critical biodiversity areas identified in bioregional plans;*	The facility will require the clearance of natural vegetation in excess of 300 m^2 in areas of natural vegetation. A portion of the respective facility is located within a Critical Biodiversity area in the Mpumalanga Province.
Listing Notice 3 GN R324	*The development of—*	The facility will likely entail the development of infrastructure with physical footprints of 10m^2 or more

Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended in 2017.	Describe the portion of the proposed project to which the applicable listed activity relates.
Activity 14	*(ii) infrastructure or structures with a physical footprint of 10 square metres or more;* *f. Mpumalanga* *i. Outside urban areas:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ff) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	within a watercourse / surface water feature or within 32m from the edge of a watercourse / surface water feature. Although the layout will be designed to avoid the identified surface water features / watercourse as far as possible, some of the infrastructure / structures will likely need to traverse the identified surface water features / watercourses. The construction of the infrastructure (MV caballing and roads) for the development will occur within Critical Biodiversity Areas (CBAs) located outside of urban areas.
Listing Notice 3 GN R324 Activity 18	*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:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	Internal access roads will be required to access the wind turbines, as well as the respective substation. Existing roads will be used wherever possible. Internal access roads will thus likely be widened by more than 4 m or lengthened by more than 1 km. These roads will occur within the Mpumalanga Province, outside urban areas.
Listing Notice 3 GN R324 Activity 23	*The expansion of—* *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:* *(bb) National Protected Area Expansion Strategy Focus areas;* *(ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;*	The facility will likely entail the development and expansion of roads by $10m^2$ or more within a surface water feature / watercourse or within 32 m from the edge of a surface water feature / watercourse. Although the layout will be designed to avoid the identified surface water features / watercourses as far as possible, some of the existing internal and access roads may likely need to traverse some of the identified surface water features / watercourses. The proposed developments occur within CBAs, and are located outside urban areas.

3.3 THE NATIONAL HERITAGE RESOURCES ACT, 1999 (ACT NO 25 OF 1999 - NHRA)

Section 38 (1) of the National Heritage Resources Act, 1999 (NHRA) lists development activities that would require authorisation by the responsible heritage resources authority. Activities considered applicable to the proposed project include the following:

- "(a) The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300 m in length;
- (c) any development or other activity which will change the character of a site; and
- (i) exceeding 5000 m² in extent."

The NHRA, 1999, requires that a person intending to undertake such an activity must notify the relevant national and provincial heritage authorities at the earliest stages of initiating such a development. The relevant heritage authority would then in turn, notify the person whether a Heritage Impact Assessment Report should be submitted. According to Section 38(8) of the NHRA, 1999, a separate report would not be necessary if an evaluation of the impact of such development on heritage resources is required in terms of the Environment Conservation Act, 1989 (No. 73 of 1989) (ECA) (now replaced by NEMA, Act 107 of 1998) or any other applicable legislation. The decision-making authority must ensure that the heritage evaluation fulfils the requirements of the NHRA, 1999, and take into account any comments and recommendations made by the relevant heritage resources authority.

The Heritage Impact Assessment, which forms part of this S&EIA process will be submitted to the South African Heritage Resources Authority (SAHRA) for comment.

In South Africa, the law is directed towards the protection of human-made heritage, although places and objects of scientific importance are covered. The NHRA, 1999, also protects intangible heritage such as traditional activities, oral histories and places where significant events happened. While not specifically mentioned in the NHRA, scenic routes are recognised as a category of heritage resources which requires grading as the Act protects area of aesthetic significance.

The heritage impact assessment reports will be submitted to the SAHRA for comment.

3.4 NATIONAL DEPARTMENT OF AGRICULTURE, LAND REFORM AND RURAL DEVELOPMENT (DALRRD)

A renewable energy facility requires approval from the National Department of Agriculture, Land Reform and Rural Development (DALRRD) if the facility is on agriculturally zoned land. A *No Objection Letter* for the change in land use is required. This letter is one of the requirements for receiving municipal rezoning. This application requires a motivation backed by good evidence that the development is acceptable in terms of its impact on the agricultural production potential of the development site.

3.4.1 SUBDIVISION OF AGRICULTURAL LAND ACT, 1970 (ACT NO. 70 OF 1970 - SALA)

In terms of the Subdivision of Agricultural Land Act, 1970, any application for change of land use must be approved by the Minister of Agriculture. This is a consent for long-term lease in terms of the SALA. If DALRRD approval for the development has already been obtained in the form of the No Objection letter, then SALA approval should not present any difficulties. Note that SALA approval is not required if the lease is over the entire farm portion. SALA approval (if required) can only be applied for once the Municipal Rezoning Certificate and EA has been obtained.

3.5 CONSERVATION OF AGRICULTURAL RESOURCES, 1983 (ACT NO. 43 OF 1983)

The Conservation of Agricultural Resources Act (CARA), 1983 states that no degradation of natural land is permitted. The Act requires the protection of land against soil erosion and the prevention of water logging and salinization of soils by means of suitable soil conservation works to be constructed and maintained. The utilisation of marshes, water sponges and watercourses are also addressed.

Rehabilitation after disturbance to agricultural land is managed by the CARA. A consent in terms of CARA is required for the cultivation of virgin land. Cultivation is defined in CARA as “any act by means of which the topsoil is disturbed mechanically”. The purpose of this consent for the cultivation of virgin land is to ensure that only land that is suitable as arable land is cultivated. Therefore, despite the above definition of cultivation, disturbance to the topsoil that results from the construction of a renewable energy facility and its associated infrastructure does not constitute cultivation as it is understood in CARA. This has been corroborated by Anneliza Collett (Acting Scientific Manager: Natural Resources Inventories and Assessments in the Directorate: Land and Soil Management of the Department of Agriculture, Land Reform and Rural Development (DALRRD)). The construction and operation of the facility will therefore not require consent from the Department of Agriculture, Land Reform and Rural Development in terms of this provision of CARA.

3.6 NATIONAL VELD AND FOREST FIRE ACT, 1998 (ACT NO. 101 OF 1998)

The purpose of the National Veld and Forest Fire Act, as amended by the National Fire Laws Amendment Act (Act 12 of 2001), is to prevent and combat veld, forest and mountain fires throughout South Africa. The Act applies to the open countryside beyond the urban limit and puts in place a range of requirements. It also specifies the responsibilities of landowners. The term 'owners' includes lessees, people in control of land, the executive body of a community, the manager of State land, and the chief executive officer of any local authority. The requirements include, but are not limited to, the maintenance of firebreaks and availability of firefighting equipment to reasonably prevent the spread of fires to neighbouring properties.

3.6.1 THE ENVIRONMENT CONSERVATION ACT, 1989 (ACT NO.73 OF 1989), THE NATIONAL NOISE CONTROL REGULATIONS: GN R154 OF 1992

The Environment Conservation Act, 1989 (ECA) allows the Minister of Environmental Affairs and Tourism (now the "Minister of Forestry, Fisheries and the Environment") to make regulations regarding noise, amongst other concerns. The Minister has made noise control regulations under the ECA.

In terms of section 25 of the ECA, the national noise-control regulations (NCR) were promulgated (GN R154 in *Government Gazette* No. 13717 dated 10 January 1992). The NCRs were revised under Government Notice Number R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.

Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996 legislative responsibility for administering the NCR was devolved to provincial and local authorities.

These regulations define "**disturbing noise**" as:

> *"Noise level which exceeds the zone sound level or, if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more".*

These Regulations prohibits anyone from causing a disturbing noise as defined above. The Noise Assessment will take these Regulations into consideration when identifying and assessing the potential noise impacts associated with the proposed development.

3.7 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT, 2004 (ACT NO. 39 OF 2004)

Section 34 of the Air Quality Act, 2004 (AQA) makes provision for:

1. The Minister to prescribe essential national noise standards –

   For the control of noise, either in general or by specified machinery or activities or in specified places or areas; or

   For determining –

   a definition of noise; and

   the maximum levels of noise.

2. When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.

This section of the Act is in force, but no such standards have yet been promulgated.

An atmospheric emission license issued in terms of Section 22 may contain conditions in respect of noise. This however will not be relevant to this proposed development.

3.7.1 NATIONAL DUST CONTROL REGULATIONS, 2013

The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004), makes provision for national dust control regulations. These regulations prescribe dust fall

standards for residential and non-residential areas. These Regulations also provide for dust monitoring, control and reporting.

The acceptable dust fall out rates are:

Restriction Area	Dust Fall (D) (mg/m^2/day, 30-day average)	Permitted Frequency of exceedance
Residential	D<600	Two within a year, not sequential months
Non- Residential	600 <D< 1200	Two within a year, not sequential months

These rates are to be adhered to by the developer during the life of the project.

3.8 NATIONAL WATER ACT, 1998 (ACT NO. 36 OF 1998 - NWA)

The National Water Act, 1998 (NWA) provides for constitutional requirements including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State.

A water resource includes any watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse is interpreted 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 to be a watercourse.

Relevant water uses for the proposed construction of the WEF which will require access roads over watercourses and drainage channels and boreholes for construction water, in terms of Section 21 of the Act include but are not limited to the following:

- Section 21 (a): Abstraction of water from boreholes and rivers or dams;
- Section 21 (c): Impeding or diverting the flow of water in a watercourse;
- Section 21 (i): Altering the bed, banks, course or characteristics of a watercourse; and
- Section 21 (g): Storage of domestic waste in conservancy tanks.

GN 1199 of 18 December 2009 allows for GA for the above water uses based on certain conditions. It also stipulates that these water uses must be registered with the responsible authority.

Pollution of river water is a contravention of the NWA. Chapter 3, Part 4 of the NWA deals with pollution prevention and in particular the situation where pollution of a water resource occurs or might occur as a result of activities on land. The person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources.

Chapter 3, Part 5 of the NWA deals with pollution of water resources following an emergency incident, such as an accident involving the spilling of a harmful substance that finds or may find its way into a water resource. The responsibility for remedying the situation rests with the person responsible for the incident or the substance involved.

3.8.1 PERMIT REQUIREMENTS

A Water Use License Application (WULA) or a GA may be required. This will be determined by the Department of, Water and Sanitation (DWS) during the WULA pre-application process.

This process will run separate to this EA application process.

3.9 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT, 2004 (ACT NO. 10 OF 2004 - NEMBA)

3.9.1 THREATENED OR PROTECTED SPECIES LIST, 2015

Amendments to the Threatened or Protected Species (TOPS) list were published on 31 March 2015 in Government Gazette No. 38600 and Notice 256 of 2015. Certain flora and fauna that occur on the site may be threatened or protected.

3.9.2 ALIEN AND INVASIVE SPECIES REGULATIONS, 2016

The Act and Regulations set out various degrees of Invasive Species (Plants, Insects, Birds, Animals, Fish and Water Plants) and requires that certain of those invasive species are documented and, in some cases, removed from properties in South Africa.

The Regulations list 4 categories of invasive species that must be managed, controlled or eradicated from areas where they may cause harm to the environment, or that are prohibited to be brought into South Africa. A Terrestrial Ecology Assessment will be conducted as part of this S&EIA process to identify as well as propose ways in which to manage alien invasive species found at the proposed site area.

3.10 THE NATURE AND ENVIRONMENTAL CONSERVATION ORDINANCE NO. 19 OF 1974

The Ordinance was developed to protect both animal and plant species within the various provinces of the country which warrant protection. These may be species which are under threat, or which are already considered to be endangered and species are listed in the relevant documents. Specialists Assessment will be conducted as part of this S&EIA process to identify threatened or endangered species or species or concern present on site. These assessments will also propose methods in which to mitigate the associated impacts on such species.

3.11 NATIONAL FORESTS ACT, 1998 (ACT NO. 84 OF 1998 - NFA)

This act lists protected tree species and prohibits certain activities. The prohibitions provide that *"no person may cut, damage, disturb, destroy or remove any protected tree, or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister".* Any protected tree species recorded within the proposed site area shall be managed in accordance with the NFA a relevant.

3.12 ASTRONOMY GEOGRAPHIC ADVANTAGE ACT, 2007 (ACT. 21 OF 2007)

The Act provides for the preservation and protection of areas within the Republic that are uniquely suited for optical and radio astronomy. The Square Kilometer Array radio telescope is located in the declared Karoo Central Advantage Array and as such it is protected against harmful interference from wireless communication and electromagnetic emissions from electrical equipment. According to the DFFE Screening Tool, there were no Weather Radar installations within a 60km radius.

3.13 NATIONAL ROAD TRAFFIC ACT, 1996 (ACT NO. 93 OF 1996) (NRTA)

The technical recommendations for highways (TRH 11): *"Draft Guidelines for Granting of Exemption Permits for the Conveyance of Abnormal Loads and for other Events on Public Roads"* outline the rules and conditions which apply to the transport of abnormal loads and vehicles on public roads and the detailed procedures to be followed in applying for exemption permits are described and discussed.

Legal axle load limits and the restrictions imposed on abnormally heavy loads are discussed in relation to the damaging effect on road pavements, bridges, and culverts.

The general conditions, limitations, and escort requirements for abnormally dimensioned loads and vehicles are also discussed and reference is made to speed restrictions, power/mass ratio, mass distribution, and general operating conditions for abnormal loads and vehicles. Provision is also made for the granting of permits for all other exemptions from the requirements of the National Road Traffic Act and the relevant Regulations.

The South African National Roads Authority (SANRAL) and the Provincial Department of Transport would act as a Competent/Commenting Authority as a result of the proposed road infrastructure associated with the Sheepmoor WEF.

3.14 CIVIL AVIATION ACT, 2009 (ACT NO. 13 OF 2009) (CAA)

The Civil Aviation Act, 2009 (Act No. 13 of 2009) (CAA), governs civil aviation in the Republic. The Act provides for the establishment of a stand-alone authority mandated with the controlling, promoting, regulating, supporting, developing, enforcing and continuously improving levels of safety and security throughout the civil aviation industry. This mandate is fulfilled by the South African Civil Aviation Authority (SACAA), an agency of the Department of Transport (DoT).

The SACAA achieves the objectives of the Act by complying with the Standard 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). All proposed developments or activities in South Africa that potentially could affect civil aviation (such as Wind Farms) must be assessed by SACCAA in terms of the CARs and the South African Civil Aviation Technical Standards (SA CATs), in order to ensure civil aviation safety.

The SACAA and Air Traffic Navigation Services (ATNS) is included as a stakeholder and will be provided with an opportunity to comment during the public participation period.

3.15 PROMOTION OF ACCESS TO INFORMATION ACT, 2000 (ACT NO. 2 OF 2002) (PAIA)

The PAIA gives effect to the constitutional right of access to any information held by the state and any information that is held by another person and that is required for the exercise or protection of any rights; and to provide for matters connected therewith. The PAIA will be adhered to during all stakeholder engagement activities undertaken as part of this S&EIA process.

3.16 NATIONAL ENVIRONMENTAL MANAGEMENT ACT: NATIONAL APPEALS REGULATIONS, 2014

The purpose of these regulations is to regulate the procedure contemplated in section 43(4) of the National environmental management act relating to the submission, processing and consideration of a decision on an appeal. This Act is used to help guide and understand the appeal process and the procedures may follow.

3.17 ADDITIONAL RELEVANT LEGISLATION

The applicant must also comply with the provisions of other relevant national legislation. Additional relevant legislation that has informed the scope and content of this S&EIA Report includes the following:

- Constitution of the Republic of South Africa, 1996 (Act No. 108, 1996);
- Aviation Act, 1962 (Act No. 74, 1962);
- National Environmental Management: Waste Act, 2008 (Act No. 59, 2008);
- National Environmental Management: Protected Areas Act, 2003 (Act No. 57, 2003);
- National Roads Act, 1998 (Act No. 7, 1998)
- Occupational Health and Safety Act, 1993 (Act No. 85 of 1993);
- National Veld and Forest Fire Bill of 10 July 1998;
- Fertiliser, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947;
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- Independent Communications Authority of South Africa Act, 2000 (Act No. 13 of 2000; as amended); and
- Screening Report referred to in Regulation 16(1)(v) of the Environmental Impact Assessment Regulations 2014, as amended.

3.18 CONVENTIONS AND TREATIES

3.18.1 THE PARIS AGREEMENT (2016)

South Africa is one of 195 countries that are signatory to The Paris Agreement. The Paris Agreement is a legally binding instrument within the United Nations Framework

Convention on Climate Change (UNFCCC) that provides guidance for action on climate change, focusing on sustainable development and poverty eradication. It sets the goal of preventing increase in global average temperature to below 2 degrees Celsius and pursuing efforts to limit global temperature increase to 1.5 degrees Celsius. Previous Minister of the DFFE, Ms Edna Molewa, signed the Paris Agreement on Climate Change on behalf of South Africa on 22 April 2016.[7]

The proposed WEF fits the emission reduction targets of the Paris Agreement and its aim of sustainable development.

3.19 THE CONVENTION ON BIOLOGICAL DIVERSITY (CBD) (1993)

This is a multilateral treaty for the international conservation of biodiversity, the sustainable use of its components and fair and equitable sharing of benefits arising from natural resources. Signatories have the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction. South Africa became a signatory to the CBD in 1993, which was ratified in 1995.

The convention prescribes that signatories identify components of biological diversity important for conservation and monitor these components in light of any activities that have been identified which are likely to have adverse impacts on biodiversity. The CBD is based on the precautionary principle which states that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimise such a threat and that in the absence of scientific consensus the burden of proof that the action or policy is not harmful falls on those proposing or taking the action.

3.19.1 THE RAMSAR CONVENTION (1971)

The Convention on Wetlands, called the Ramsar Convention, as it was adopted in the Iranian city of Ramsar in 1971 and came into force in 1975, is an intergovernmental treaty that provides the framework for the conservation and wise use of wetlands and their resources. Under the three pillars of the convention the Contracting Parties commit to work towards the wise use of all their wetlands through national plans, policies and legislation, management actions and public education; designate suitable wetlands for their list of Wetlands of International Importance (the "Ramsar List") and ensure their effective management; and Cooperate internationally on transboundary wetlands, shared wetland systems, shared species, and development projects that may affect wetlands.

3.19.2 THE CONVENTION ON THE CONSERVATION OF MIGRATORY SPECIES OF WILD ANIMALS (CMS OR BONN CONVENTION) (1983)

An intergovernmental treaty, concluded under the sponsorship of the United Nations Environment Programme, concerned with the conservation of wildlife and habitats on a

[7] https://www.environment.gov.za/mediarelease/southafrica_ratifies_parisagreement (accessed on 24 January 2019).

global scale. The fundamental principles listed in Article II of this treaty state that signatories acknowledge the importance of migratory species being conserved and agree to take action to this end "*whenever possible and appropriate*", "*paying special attention to migratory species the conservation status of which is unfavourable and taking individually or in cooperation appropriate and necessary steps to conserve such species and their habitat*".

3.19.3 THE AGREEMENT ON THE CONSERVATION OF AFRICAN-EURASIAN MIGRATORY WATERBIRDS (AEWA) (1999)

An intergovernmental treaty developed under the framework of the Convention on Migratory Species (CMS), concerned with the coordinated conservation and management of migratory waterbirds throughout their entire migratory range. Signatories of the Agreement have expressed their commitment to work towards the conservation and sustainable management of migratory waterbirds, paying special attention to endangered species as well as to those with an unfavourable conservation status. The assessment of the ecology and identification of sites and habitats for migratory waterbirds is required to coordinate efforts that ensure that networks of suitable habitats are maintained and investigate problems likely posed by human activities.

3.20 NATIONAL CLIMATE CHANGE RESPONSE WHITE PAPER (2011)

Climate change is already a measurable reality and along with other developing countries, South Africa is especially vulnerable to its impacts. This White Paper presents the South African Government's vision for an effective climate change response and the long-term, just transition to a climate-resilient and lower-carbon economy and society. South Africa's response to climate change has two objectives:

- Effectively manage inevitable climate change impacts through interventions that build and sustain South Africa's social, economic and environmental resilience and emergency response capacity.
- Make a fair contribution to the global effort to stabilise greenhouse gas (GHG) concentrations in the atmosphere at a level that avoids dangerous anthropogenic interference with the climate system within a timeframe that enables economic, social and environmental development to proceed in a sustainable manner.

3.21 POLICIES AND GUIDELINES

3.21.1 ENVIRONMENTAL IMPACT ASSESSMENT GUIDELINES

Relevant guidelines and policies as applicable to the management of the S&EIA process and to this application have also been taken into account, as indicated below:

- IEM Guideline Series (Series 3): Stakeholder engagement (2002);
- IEM Guideline Series (Series 4): Specialist studies (2002);
- IEM Guideline Series (Series 5): Impact Significance (2002);
- IEM Guideline Series (Guideline 5): Companion to the EIA Regulations 2010 (October 2012);

- IEM Guideline Series (Series 7): Cumulative Effects Assessment (2002);
- IEM Guideline Series (Guideline 7): Public Participation in the EIA process (October 2012);
- IEM Guideline Series (Series 7): Alternatives in the EIA process (2002);
- IEM Guideline Series (Guideline 9): Draft guideline on need and desirability in terms of the EIA Regulations 2010 (October 2012);
- DEA (2017) Guideline on Need and Desirability, Department of Environmental Affairs (DEA) Pretoria, South Africa (2017);
- IEM Guideline Series (Series 12): Environmental Management Plans (EMP) (2002); and
- IEM Guideline Series (Series 15): Environmental impact reporting (2002).

3.21.2 THE EQUATOR PRINCIPLES (EPS) III, 2013

The principles applicable to the project are likely to include:

- Principle 2: Environmental and Social Assessment;
- Principle 3: Applicable Environmental and Social Standards;
- Principle 4: Environmental and Social Management System and Equator Principles Action Plan;
- Principle 5: Stakeholder Engagement;
- Principle 6: Grievance Mechanism;
- Principle 7: Independent Review;
- Principle 8: Covenants;
- Principle 9: Independent Monitoring and Reporting; and
- Principle 10: Reporting and Transparency.

These principles, among various requirements, include a requirement for an assessment process and an Environmental and Social Management Plan (ESMP) to be prepared by the client to address issues raised in the assessment process and incorporate actions required to comply with the applicable standards, and the appointment of an independent environmental expert to verify monitoring information.

3.21.3 SOUTH AFRICAN WIND ENERGY FACILITY GUIDELINES

The following guidelines are relevant to the proposed WEF and the potential impacts they may have on bats/avifauna and habitat that support bats/avifauna:

- South African Best Practice Guidelines for Pre-Construction Monitoring of Bats at Wind Energy Facilities. 5th Edition. 2020;
- South African Best Practice Guidelines for Operational Monitoring of Bats at Wind Energy Facilities. 5th Edition. 2020;
- South African Bat Fatality Threshold Guidelines. Edition 2. 2018;
- The Species Environmental Assessment Guideline (SANBI, 2020);

- Best-Practice Guidelines for assessing and monitoring the impact of wind-energy facilities on birds in southern Africa. Third Edition, 2015;
- Best Practice Guidelines for Verreaux's Eagle and Wind Energy (BirdLife South Africa, 2017), and the more recent draft update of these: Verreaux's Eagles and Wind Farms (BirdLife South Africa, 2021);
- The Southern African Bird Atlas Project 2 data, available at the pentad level (http://sabap2.adu.org.za/v1/index.php) (accessed at www.mybirdpatch.adu.org.za);
- IUCN 2021. The IUCN List of Threatened Species. 2021 - 3. http://www.iucnredlist.org/;
- Wind Energy Impacts on Birds in South Africa: A Preliminary review of the results of operational monitoring at the first wind farms of the Renewable Energy Independent Power Producer Procurement Programme in South Africa. BLSA. Occasional Report Series: 2;
- On a collision course: the large diversity of birds killed by wind farms in South Africa (Perold et al. 2020);
- Birds & Renewable Energy. Update for 2019. BirdLife South Africa. Birds and Renewable Energy Forum, 10 October 2019; and
- Avian Wind Farm Sensitivity Map. Birdlife South Africa. http://www.birdlife.org.za/conservation/birds-and-wind-energy/windmap.

3.21.4 INTERNATIONAL FINANCE CORPORATION (IFC) PERFORMANCE STANDARDS

The IFC's Performance Standards on Social and Environmental Sustainability (Referred to as Performance Standards hereinafter) is an environmental and social risk management tool provided by the IFC for its investment and financing clients, and is also one of the major applicable standards of the Equator Principles. As the global influence of the Equator Principles has continued to rise, more and more Equator Principles Financial Institutions (EPFI) have been applying the Performance Standards in their assessments of environmental and social impacts. Under this backdrop, the Performance Standards have become the world's leading system and tool for environmental and social risk management.

The IFC Performance Standards encompass eight topics as described in Table 3-2 below. Given that South Africa has a complex and well-balance environmental regulatory system, the IFC Performance Standards are wholly addressed in the NEMA, 1998, as amended, framework.

For reference purposes the Project Applicant, will be referred to as the 'Borrower' in Table 3.2. The project will not have adverse impacts on PS5: Land Acquisition and Involuntary Resettlement and PS7: Indigenous Peoples as there is no displacement or resettlement, and none such indigenous people are found in the proposed development area of influence.

TABLE 3.2: DESCRIPTION OF THE IFC PERFORMANCE STANDARDS

PS Description	Project Applicability
Performance Standard 1: Assessment and Management of Environmental and Social (E&S) Risks and Impacts **Objective:** Underscores the importance of identifying E&S risks and impacts and managing E&S performance throughout the life of a project.	
Borrowers are required to manage the environmental and social performance of their business activity, which should also involve communication between the Borrower/Investee, its workers and the local communities directly affected by the business activity. This requires the development of a good management system, appropriate to the size and nature of the business activity, to promote sound and sustainable environmental and social performance as well as lead to improved financial outcomes.	Section 2 of Chapter 1 of the NEMA, as amended, provides details of the environmental management principles that should be adhered to during the entire project life. Chapter 6 of the NEMA EIA Regulations, 2014 (as amended) outlines the requirements for Public Participation in respect of a project. This document represents the S&EIA process (equitable to an ESIA) undertaken for the proposed development, and comprehensively assesses the key environmental and social impacts and complies with the requirements of the NEMA EIA Regulations, 2014 (as amended). The proposed development will be managed in terms of environmental and social impacts through an approved Environmental Management Programme (EMPr) which is drafted as part of the EIA process. The following have been included as part of this Assessment: • Description of relevant Policy; • Identification of Risks and Impacts; • EMPr (included in the EIA phase); • Requirements for Monitoring and Review; • Stakeholder Engagement as part of PPP; • External Communication and Grievance Mechanism; and • Recommendation for ongoing Reporting to Affected Communities.
Performance Standard 2: Labour and Working Conditions **Objective:** Recognizes that the pursuit of economic growth through employment creation and income generation should be balanced with protection of basic rights for workers.	
For any business, its workforce is a valuable asset and a sound worker-management relationship is a key component of the overall success of the enterprise. By protecting the basic rights of workers, treating workers fairly and providing them with safe and healthy working conditions, Borrowers can enhance the efficiency and productivity of their operations and strengthen worker commitment and retention.	Whilst PS 2 is applicable to the proposed development, it will not be addressed in detail in this report as Labour and Working conditions are typically addressed prior to construction, once EA has been awarded. Recommendations are provided regarding development of a detailed Human Resources (HR) and Occupational Health and Safety (OHS) system by the Applicant. In terms of the proposed development, construction will require the appointment of an EPC contractor (and others) for completion. Appointment of contactors and employees will be 'fair and equal', and workers will be provided with a safe, healthy and inclusive work environment. The EMPr will incorporate the requirements for compliance with local and international Labour and Working legislation and good practice on the part of the contractors.
Performance Standard 3: Resource Efficiency and Pollution Prevention **Objective:** Recognizes that increased industrial activity and urbanization often generate higher levels of air, water and land pollution, and that there are efficiency opportunities.	
Increased industrial activity and urbanization often	The Project is not likely to have many large-scale and long-term impacts related to pollution.

generate increased levels of pollution to air, water and land that may threaten people and the environment at the local, regional and global level. Borrowers are required to integrate pollution prevention and control technologies and practices (as technically and financially feasible as well as cost-effective) into their business activities.	Measures to address air, water and land pollution will be contained in the EMPr. There are no material resource efficiency issues associated with the proposed development and the EMPr will include general resource efficiency measures. The project is not greenhouse gas (GHG) emissions intensive and the detailed assessment and reporting of emissions is not required. This project, however, seeks to facilitate resource efficiency and pollution prevention by contributing to the South African green economy. The project will not release industrial effluents and waste generation will be managed according to the 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. Land contamination of the site from previous land use is not a concern as the project area is mostly an agricultural area where low intensity agriculture / grazing is practiced.
Performance Standard 4: Community Health, Safety, and Security **Objective:** Recognizes that projects can bring benefits to communities but can also increase potential exposure to risks and impacts from incidents, structural failures, and hazardous materials.	
Business activities can increase the potential for community exposure to risks and impacts arising from equipment accidents, structural failures and releases of hazardous materials as well as impacts on a community's natural resources, exposure to diseases and the use of security personnel. Borrowers are responsible for avoiding or minimizing the risks and impacts to community health, safety and security that may arise from their business activities.	The requirements for PS 4 have been addressed in this report (10.7) and will be managed in accordance with the EMPr. It is understood that the project infrastructure and equipment will be designed to good industry standards to minimise risks to communities, however a community health and safety plan should be compiled by the Applicant prior to construction to meet the requirements of IFC Performance Standard 4 (Community Health, Safety and Security). To ensure compliance with PS 4, Applicant will need to evaluate the risks and impacts to the health and safety of the affected community during the design, construction and operation of the proposed development and establish preventive measures to address them in a manner commensurate with the identified risks and impacts as contained in this report. Such measures need to adhere to the precautionary principle for the prevention or avoidance of risks and impacts over minimization and reduction.
Performance Standard 5: Land Acquisition and Involuntary Resettlement **Objective:** Applies to physical or economic displacement resulting from land transactions such as expropriation or negotiated settlements.	
Land acquisition due to the business activities of a Borrowers may result in the physical displacement (relocation or loss of shelter) and economic displacement (loss of access to resources necessary for income generation or as means of livelihood) of individuals or communities. Involuntary resettlement occurs when affected individuals or	Not Applicable

communities do not have the right to refuse land acquisition and are displaced, which may result in long-term hardship and impoverishment as well as environmental damage and social stress. Borrowers are required to avoid physical or economic displacement or minimize impacts on displaced individuals or communities through appropriate measures such as fair compensation and improving livelihoods and living conditions.	
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources **Objective**: Promotes the protection of biodiversity and the sustainable management and use of natural resources.	
Protecting and conserving biodiversity (including genetic, species and ecosystem diversity) and its ability to change and evolve, is fundamental to sustainable development. Borrowers are required to avoid or mitigate threats to biodiversity arising from their business activities and to promote the use of renewable natural resources in their operations.	In terms of protecting and conserving biodiversity, specialists have assessed the impacts of the proposed development within the area of influence and will recommend measures to prevent/avoid/mitigate these potential impacts during the EIA phase. Specialist methods include a combination of literature review, stakeholder engagement and consultation, and in-field surveys. This 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.
Performance Standard 7: Indigenous Peoples Objective: Aims to ensure that the development process fosters full respect for Indigenous Peoples.	
Indigenous Peoples are recognized as social groups with identities that are distinct from other groups in national societies and are often among the marginalized and vulnerable. Their economic, social and legal status may limit their capacity to defend their interests and rights to lands and natural and cultural resources. Borrowers are required to ensure that their business activities respect the identity, culture and natural resource-based livelihoods of Indigenous Peoples and reduce exposure to impoverishment and disease.	Not Applicable. As per the international instruments under the United Nations (UN) Human Rights Conventions, no indigenous peoples are living within the study area. The Project does not involve displacement.
Performance Standard 8: Cultural Heritage	

Objective: Aims to protect cultural heritage from adverse impacts of project activities and support its preservation.

Aims to protect cultural heritage from adverse impacts of project activities and support its preservation.	A cultural heritage impact assessment and paleontological impact assessment has been undertaken for the proposed development (10.8). Consultation will also take with the SAHRA.

4. SCOPE OF WORK AND SCOPING PHASE METHODOLOGY

The EIA process formally commences with notifying the competent authority (in this case the DFFE) of the proposed development through the submission of an application form. The EAP, along with a team of technical specialists, commence the Scoping Phase, to inform decision regarding the appropriate "scope" of the EIA phase.

The existing environmental baseline of the site proposed for development is established during this phase through a desktop assessment and site visits. The type of development is considered and its anticipated impacts on the existing environment informs the specialists' studies to be undertaken. The methodology of how these impacts should be assessed within the EIA phase is also determined.

A DSR – this document, is compiled which is made available for public and stakeholder review and comment for a legislated period of 30 days. All comments received in response to the DSR will be considered, responded to in the Comments and Responses Trail and incorporated, where applicable, into the Final Scoping Report (FSR) and Plan of Study for EIA.

Should the FSR be approved by the DFFE, the EIA Phase is initiated, which includes further detailed specialist assessments. A Draft EIA Report is compiled and incorporates these findings. The Draft EIA Report is made available for stakeholder and public review for a period of 30 days. Comments are again considered and responded to in a Final EIA Report.

I&APs are then notified of the submission of the Final EIA Report to DFFE.

Once a Final EIA Report has been submitted, the competent authority (the DFFE) will make a decision within 57 days on whether to grant or refuse EA for the application.

4.1 DFFE ENVIRONMENTAL SCREENING TOOL

In terms of GN R960 (promulgated on 5 July 2019) and Regulation 16 (1) (b) (v) of the EIA Regulations, 2014 (as amended), the submission of a Screening Report generated from the national web based environmental screening tool is compulsory for the submission of BA and EIA applications in terms of Regulation 19 and 21 of EIA Regulations, 2014 (as amended). The Screening Report generated for the proposed development is included in Volume II of this Report.

The screening report was generated based on the selected classification, i.e., Infrastructure | Electricity | Generation | Renewable | Wind. No intersections with Environmental Management Frameworks (EMF) were found. In terms of development incentives, restrictions, exclusions or prohibitions, no intersections with any development zones were found.

Based on the selected classification to produce the screening tool report, and the environmental sensitivities of the development footprint, the screening report generates a list of specialist assessments identified for inclusion in the assessment report. It is the

responsibility of the EAP to confirm this list and to motivate in the assessment report, the reason for not including any of the identified specialist study.

Table 4.1 provides a summary of the specialist assessments identified by the screening tool reports, and the response to each assessment in terms of the proposed development.

Specialist assessments undertaken (Volume II) have considered the results of the DFFE Screening Tool in their terms of reference.

Specialist assessments undertaken (Volume II: Specialist Scoping Reports) have considered the results of the DFFE Screening Tool in their terms of reference.

TABLE 4.1: SPECIALIST ASSESSMENTS IDENTIFIED IN TERMS OF THE NATIONAL WEB-BASED SCREENING TOOL & SPECIALIST

Identified Specialist Assessment	**Assessment Protocol**	**Identified Sensitivity**	
		By DFFE Screening Report	**By Specialist / EAP**
Agriculture Theme	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 MW or more, gazetted on 20 March 2020. This protocol replaces the requirements of Appendix 6 of the Environmental Impact Assessment Regulations.	Very High Sensitivity	Very High Sensitivity
	Comment: This site sensitivity verification verifies those parts of the site that are indicated as cropland as being of high agricultural sensitivity (or very high for irrigated cropland), and the rest of the site as being of medium agricultural sensitivity with a maximum land capability of 7.		
Aquatic Biodiversity Theme	Protocol for the Specialist Assessment and minimum report content requirements for Environmental Impacts on Aquatic Biodiversity, gazetted on 20 March 2020.	Very High Sensitivity	High Sensitivity
	Comment: The sensitivity ratings of High No-go and Low were determined through an assessment of the aquatic habitat sensitivity and related constraints. However, these No-Go areas (with buffers) relate in general terms to the project and there are areas where encroachment on these areas would occur (i.e. existing road crossings within systems, but this is considered acceptable since these areas have already been impacted. These proposed constraints / buffers do not include bird and or bat specialist buffers / constraints as theirs buffers along aquatic features are at times far larger around aquatic features, than those required for the known aquatic species within this region.		

Archaeological and Cultural Heritage Theme	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Low Sensitivity	High Sensitivity
	Comment: The screening report states that the affected area is of low significance. I disagree with this as there have been no previous surveys in the general area with which the screening tool can compare. Just because an area does not have known sites, does not mean it is of low significance. It means that there have probably been no previous survey heritage. The survey results indicate the area is of low, medium and high significance.		
BAT Impact Theme	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	High Sensitivity	Medium Sensitivity
	Comment: Based on current taxonomic information and field data, no threatened species were recorded or expected to occur on site. The acoustic monitoring results show that the median number of bat passes/hour per night at height (50 m and 90 m) would classify the PAOI as low sensitivity for Cape serotine and moderate to high sensitivity for Egyptian free-tailed bat depending on season. The outcome of the Site Sensitivity Verification (SSV) is that the overall sensitivity of the site varies by bat species and season, linked to their relative activity levels. However, the two sensitivities are based on different data types. The Screening Tool is based on broad scale habitat data whereas the SSV is based on bat collision risk with wind turbines derived from activity data collected within the project boundary, and is therefore a better approximation of the project sensitivity because collision is the primary impact. As such the SSV disputes the current environmental sensitivity of the proposed project area, arguing that the sensitivity should be reduced to low for Cape serotine, medium-high for Egyptian free-tailed bat. This has been given an average rating of Medium for the purposes of this table.		
Landscape / Visual Theme	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Very High Sensitivity	Very High Sensitivity
	Comment: The very high sensitivity rating for the landscape theme does relate to the potential visual impact of the study area. The area consists of a varied landscape which includes wide open grasslands, valleys, ridges and escarpments.		

Plant Species Theme	Protocol for specialist assessment and minimum report content requirements for Environmental Impacts on Terrestrial Plant Species, gazetted on 20 March 2020.	Medium Sensitivity	Medium Sensitivity
	Comment: The Screening Tool indicated that the Plant Theme Sensitivity as being of medium sensitivity. However, the very nature of the original vegetation in this area (Moist Sandy Highveld Grassland) is low growing and visually uniform, which does not provide much visual screening. Although the grassland vegetation is not overly sensitive to the development it does not assist in reducing the visual expose of the turbines.		
Avian Theme	Protocol for the specialist assessment and minimum report content requirements for the Environmental Impact Assessment Regulations. 2014 (GNR 326, 7 April 2017) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).	Low Sensitivity	Not Determined.
	Comment: As the DFFE screening tool resulted in low sensitivity, the avian species are applicable under the Animal Theme. Based on the available SABAP2 data, the Site Sensitivity Verification survey, and the integrated pre-construction monitoring surveys conducted at the WEF Project Site, a classification of High Sensitivity for avifauna (for the Animal Species Theme) is confirmed for the Sheepmoor WEF and a classification of Low Sensitivity is suggested for the Vulture Species Theme. Additionally, based on the Site Sensitivity Verification survey and the integrated pre-construction monitoring conducted at the Project Site thus far, the classification of High Sensitivity for avifauna is supported for the Sheepmoor WEF Grid Connection PAOI.		
Civil Theme	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Civil Aviation Installations, gazetted on 20 March 2020.	Medium Sensitivity	Not Determined.
	Comment: According to the Screening Tool, this proposed Sheepmoor WEF is located within 5km of an air traffic control or navigation site.		
Defence Theme	Protocol for the specialist assessment and minimum report content requirements for Environmental Impacts on Defence Installations, gazetted on 20 March 2020.	Low Sensitivity	Low Sensitivity
	Comment:		

	Site verification confirms the low sensitivity. During the public consultation, the South African National Defence Force (SANDF) will be consulted by the EAP / Project Applicant to confirm that there will be no impact on the defence installation of the development area and immediate surrounds. A site sensitivity verification report will be produced by the EAP for inclusion as part of the EIA process.		
Animal Species Theme	Protocol for specialist assessment and minimum report content requirements for Environmental Impacts on Terrestrial Animal Species, gazetted on 20 March 2020.	High Sensitivity	High Sensitivity
	Comment: The screening tool indicated "High" sensitivity for the two faunal SCC species. Considering the known habitat preferences for the two SCC species, it is the opinion of the specialists that the project area ranges from Low to High sensitivity; several areas representative of important habitat are considered High sensitivity and should ideally be excluded within the development footprint, and/or a process of micro-siting would be required if development occurs in these areas. The nature of the site and its suitability as habitat for the two species is discussed in the remainder of the report. The High sensitive areas are indicated on a constraints map.		
Noise Theme	Protocol for specialist assessment and minimum report content requirements for Noise Impacts, gazetted on 20 March 2020.	Very High Sensitivity	Very High Sensitivity
	Comment: There are permanent or temporary residential activities located within 2,000m from the area where wind turbines may be developed. These residential activities are considered to be noise-sensitive, and the areas are considered to have a "Very High" sensitivity to noise.		
Flicker Theme	Site Sensitivity Verification requirements where a specialist assessment is required but no Specific Assessment Protocol has been prescribed, gazetted 20 March 2020.	Very High Sensitivity	Not Determined.
	Comment: No flicker assessment has been / will be undertaken for the scoping phase. The outcome of the noise assessment / visual study will assist the EAP in the flicker assessment during the EIA phase of the development.		
Traffic Assessment	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Not Determined.	Not Determined.

	Comment: Traffic assessment was identified as a required specialist assessment, but no environmental sensitivity was determined by the screening report. A desk-based traffic assessment was undertaken for the proposed development. A site visit will be undertaken for the EIA phase.		
Geotechnical Theme	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Not Determined.	Not Determined.
	Comment: Geotechnical assessment was identified as a required specialist assessment, but no environmental sensitivity was determined by the screening report. The EAP is of the opinion that a Geotechnical Assessment for the development can and will only be undertaken prior to the commencement of the construction phase. The EAP has not included this assessment as part of the application process.		
Terrestrial Biodiversity Theme	Protocol for the Specialist Assessment and minimum report content requirements for Environmental Impacts on Terrestrial Biodiversity, gazetted on 20 March 2020.	Very High Sensitivity	Medium Sensitivity
	Comment: Preferred areas would be low aquatic and/or terrestrial sensitivity areas, followed by moderate sensitivity areas (where strategic footprints would need to follow a clear mitigation process and rationale.		
Palaeontology Theme	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Very High Sensitivity	Very High Sensitivity
	Comment: The area is of very high palaeontological sensitivity. Dr Alan Smith undertook a desktop Palaeontological Impact Assessment (PIA) for the proposed Sheepmoor WEF. While the palaeontology is of very high sensitivity as it forms part of the Vryheid formation, very few significant vertebrate fossils have been found in it.		
RFI (Radio Frequency	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Very High Sensitivity	Not Determined

Interference) Theme	Comment: The screening tool described the study area as very high Radio Frequency Interference Theme (RFI) sensitivity. The South African Radio Astronomy Observatory (SARAO) will be included as a registered I&AP as part of the EIA process. During the public consultation of the proposed development the network operators will be consulted to determine if the closest proposed turbine will be within range which will affect the distribution from the radar stations.		
Socio-Economic Assessment	Site Sensitivity Verification Requirements where a Specialist Assessment is required but no specific assessment protocol has been prescribed, gazetted on 20 March 2020.	Not Determined.	Not Determined.
	Comment: Socio-economic assessment was identified as a required specialist assessment, but no environmental sensitivity was determined by the screening report. Following the scoping assessment and verification, it is recommended that a full Social Impact Assessment be undertaken by a social specialist.		

4.2 SPECIALIST SCOPING METHODOLOGY

To evaluate the potential preliminary environmental impacts and verify the sensitivity of the screening report, information relating to the existing environmental conditions was collected through field and desktop research, this is known as the baseline.

Each of the specialist assessments followed a systematic approach to the assessment of impacts, with the key steps being:

- Description of existing environment/baseline conditions;
- Site Sensitivity Verification;
- Prediction of likely potential impacts, including cumulative impacts (both positive and negative), where relevant;
- Plan of Study for the EIA Phase; and
- Summary of findings and recommendations.

The methodology each specialist used to collate their report is summarised below and is available in each Specialist Report attached to this Report as Volume II.

4.2.1 SOILS, LAND USE AND AGRICULTURAL POTENTIAL

The assessment was based on a verification of current agricultural land use on the site and was informed by existing climate, soil, and agricultural potential data for the site. The level of agricultural assessment is considered entirely adequate for an understanding of on-site agricultural production potential for the purposes of this assessment.

For this purpose, only an understanding of the general range and distribution patterns of different soil conditions across the site is required. A more detailed soil survey would be extremely time consuming and impractical to conduct, given the very large assessment area, and would not provide any additional data that would add value to the assessment of the agricultural impact of the WEF. This is because a wind farm extends over a very large surface area.

The layout design of a wind farm is complex and there are multiple interacting factors that determine the turbine locations that will ensure the viability of the wind farm. Each turbine influences the amount of wind that the other turbines receive. Therefore, the location of one turbine cannot simply be shifted without requiring other turbines to be shifted as well, to retain the viability of all the turbines. To shift turbines to account for variation in soil conditions would be extremely complex and would require a level of soil mapping detail across the whole wind farm area that would be practically impossible to achieve.

4.2.2 FRESHWATER AND WETLANDS (AQUATICS)

The study followed the approaches of several national guidelines regarded for aquatic assessments. These were then modified by the specialist, to provide a relevant mechanism of assessing the present state of the study systems applicable to the specific environment, and in a clear and objective manner, assess the potential impacts associated with the proposed development site. The methodology also included the considerations of the

Macfarlene & Bredin (2017) buffer models and revisions to the SANBI National Wetland Inventory.

The assessment made use of the National Wetland Classification System (NWCS) approach and included delineating any natural waterbodies and assessing the potential consequences of the proposed development on the surrounding watercourses.

The aquatic report was produced to meet the criteria to fulfil a Specialist Assessment Report as portions of the proposed development area were rated as very high sensitivity as per the DFFE Screening Tool.

4.2.3 TERRESTRIAL ECOLOGY (FLORA AND FAUNA)

The terrestrial biodiversity assessment and report is based on a comprehensive desktop study to identify potential risks to terrestrial biodiversity inclusive of the DFFE National Environmental Screening Tool, relevant regional biodiversity planning frameworks, any previous studies as well as interrogation of applicable databases.

The methodology used for the Faunal Assessment, including a background desktop study and site visit is outlined in the subsections below:

Desktop Study

- Distributional records for the invertebrate Species of Conservation Concern (SCC) were extracted from digitized databases of several South African museums (e.g., Iziko Museum of South Africa, Ditsong National Museum of Natural History, South African National Collections of Insects).
- For both faunal SCC, online resources, such as the IUCN Red List of Threatened Species (https://www.iucnredlist.org/), the Orthoptera Species File Online (http://orthoptera.speciesfile.org/HomePage/Orthoptera/HomePage.aspx), and iNaturalist (https://www.inaturalist.org/) were also consulted for information on geographic distributions and habitat requirements.
- Published information on the two faunal SCC were investigated to further assess their distribution range, ecology, habitat, and any life history requirements.
- Ecosystem-level data and broad-scale habitat was assessed using the following resources:
    - Vegetation Map of South Africa (SANBI, 2018; Skowno et al., 2019).
    - Mpumalanga Biodiversity Sector Plan (MBSP) terrestrial assessment (MTPA, 2014a, 2014b; Lötter, 2015).
    - Ecosystem Threat Status and Protection level of South Africa's ecosystems (Skowno et al., 2019; South African National Biodiversity Institute and Department of Forestry, 2021).
    - Landcover based habitat modification (Skowno, 2020).
    - South Africa's Important Bird Areas (IBA) (Marnewick et al., 2015): IBAs are selected using the presence of globally threatened species, groups of species with a restricted range (<50 000 km^2), species assemblages confined to a single biome, and congregations of one or more species.

This study is primarily desktop based and relies on most recent available information including literature, online and other databases and aerial photography as well as a limited time site visit, in the late mid-autumn and mid-winter season.

4.2.4 AVIFAUNA

The following methods and sources were used to compile this report:

- Bird distribution data of the Southern African Bird Atlas Project (SABAP2) was obtained from the University of Cape Town (https://sabap2.birdmap.africa/), to ascertain which species occur within the Broader Area i.e. within a block consisting of 12 pentads. A pentad grid cell covers 5 minutes of latitude by 5 minutes of longitude (5'× 5'). Each pentad is approximately 8 × 9 km. From 2007 to date, a total of 179 full protocol lists (i.e., surveys lasting a minimum of two hours each) have been completed for this area. In addition, 218 ad hoc protocol lists (i.e., surveys lasting less than two hours but still yielding valuable data) have been completed;
- The national threatened status of all priority species was determined with the use of the most recent edition of the Red Data Book of Birds of South Africa (Taylor et al. 2015), and the latest authoritative summary of southern African bird biology (Hockey et al. 2005);
- The global threatened status of all priority species was determined by consulting the (2022.2) IUCN Red List of Threatened Species (http://www.iucnredlist.org/);
- A classification of the vegetation in the WEF application site was obtained from the Atlas of Southern African Birds 1 (SABAP 1) (Harrison et al. 1997) and the National Vegetation Map (2018) from the South African National Biodiversity Institute website (Mucina & Rutherford 2006 & http://bgisviewer.sanbi.org);
- The Important Bird Areas of Southern Africa (Marnewick et al. 2015) was consulted for information on potentially relevant Important Bird Areas (IBAs);
- Satellite imagery (Google Earth ©2023) was used in order to view the Broader Area on a landscape level and to help identify sensitive bird habitat;
- Priority species for wind developments were identified from the most recent (November 2014) list of priority species for wind farms compiled for the Avian Wind Farm Sensitivity Map (Retief et al. 2012);
- The South African National Biodiversity BGIS map viewer was used to determine the locality of the proposed site relative to National Protected Areas;
- The DFFE National Screening Tool was used to determine the assigned avian sensitivity of the WEF and Grid application site;
- The primary source of information on avifaunal diversity, abundance and flight patterns at the site were the results of a **pre-construction programme** conducted between Feb 2022 and Feb 2024 at the proposed Mulilo WEF Cluster (Emvelo WEF, Rochdale WEF and Sheepmoor WEF application sites). The primary methods of data capturing were walk transect counts, drive transect counts, focal point monitoring, vantage point counts and incidental sightings; and

- Information gained from pre-construction monitoring at four potential wind farm sites in close proximity to the current site, namely Ujekamanzi WEFs 1–2 and Camden WEFs 1–2 also assisted in providing a comprehensive picture of avifaunal abundance and diversity in the greater area, including the current study area.

The objective of the pre-construction monitoring at the proposed Sheepmoor WEF was to gather baseline data over a period of four seasons (seven surveys) on the following aspects pertaining to avifauna:

- The abundance and diversity of birds at the proposed WEF site and at a suitable control site, to measure the potential displacement effect of the wind farm.
- Flight patterns of priority species to assess the potential collision risk with the turbines and associated power line infrastructure.

Monitoring at the WEF sites and a Control Site were conducted by a team of monitors during the following time envelopes:

- 21 February–03 March 2022;
- 21–27 April 2022;
- 01–16 June 2022;
- 06–21 October 2022;
- 14–17 January 2023 (Transect counts only);
- 05–09 May 2023;
- 28–30 June 2023; and
- 22–26 August 2023.

Additional Vantage Point and Transect Count monitoring was conducted near the identified Martial Eagle nest to gain a better understanding of their flight behaviour. Five surveys were conducted, in addition to the seven surveys completed as part of the pre-construction monitoring.

The five additional surveys were conducted during the following time envelopes:

- 17–22 October 2023;
- 15–23 November 2023;
- 30 November–05 December 2023;
- 17–22 January 2024; and
- 14–20 February 2024.

4.2.5 BATS

The Project Area of Influence (PAOI) was defined as the Area of Interest (AoI) of the development cluster plus a 10 km buffer given that bats are flying mammals (Scottish Natural Heritage 2019). This area was studied at a desktop level to determine which bat species (i.e., impact receptors) are likely to occur within the PAOI, to provide information on their natural history and conservation status, and to contextualise the project site within the larger social-ecological environment with respect to bats.

Bats were also studied through 12 months of field surveys in the AoI which began on 26 April 2022 and ended on 13 May 2023. Monitoring continued at two locations until November 2023 and these additional data will be incorporated into the final EIA reporting for the proposed development. Bat activity was sampled at 10 locations within the AoI with Wildlife Acoustics, Inc. SM4 bat detectors.

At eight locations (AM4 – AM11), SMM-U2 microphones were positioned at the top of a 10 m aluminium mast. At the remaining two locations (AM1 and AM3), microphones were positioned on meteorological towers at 10 m, 50 m, and 90 m respectively.

Sampling took place nightly, from 30 minutes before sunset to 30 minutes after sunrise, and the study summarises 383 nights of bat activity data. This monitoring period therefore spans of all four seasons providing a representative account of temporal bat activity patterns across a year. Acoustic data retrieved from each bat detector were processed using Kaleidoscope® Pro (Version 5.4.2, Wildlife Acoustics, Inc.). Bats were automatically identified using the embedded "Bats of South Africa Version 5.4.0" reference library and verified by inspecting echolocation files. The number of acoustic files recorded was used as a measure to quantify bat activity, whereby each file was considered one bat pass of the microphone.

Roost surveys were also undertaken, which entailed discussions with landowners to locate any known roosts or potential roosts with evidence of bats. In addition, buildings at farmsteads within the PAOI, as well as accessible rocky outcrops/crevices, were systematically surveyed during field visits in November 2022 (spring), and January 2023 (summer). The surveys aimed to directly observe roosting bats, locate evidence of roosting bats (e.g., culled insect remains, fur-oil-stained exit and entry points, guano/droppings), and assess the likelihood for each potential roost to support bats.

4.2.6 NOISE

This assessment was based on a desktop study as well as ambient noise level data collected during the site visit that was undertaken in June 2023, and was assessed in terms of the Noise Sensitivity Theme using the National Web-based Environmental Screening Tool. Basic predictive models were also used to identify potential issues of concern. Wind turbines do emit noises at sufficient levels to propagate over large distances and the assessment indicates the potential noise impact on the closest receptors.

The data indicate ambient sound levels are generally low, with faunal and other natural sounds as the main source of noise in the area. Wind-induced noises influence ambient sound levels during periods with increased winds, with the ambient sound levels determined by numerous factors (vegetation type and density, faunal species in the area, etc.).

The low ambient sound level was confirmed during a site visit conducted from the 7 to 9 June 2023 during periods with low winds, with data to be processed and included in the recommended Noise Impact Assessment Report for the EIA Phase. The ambient sound levels were measured in terms of Government Notice Regulation 20 of March 2020.

4.2.7 HERITAGE, ARCHAEOLOGY AND PALAEONTOLOGY

The method for Heritage assessment consists of several steps. The scoping assessment relied on a desktop assessment as well as a preliminary site visit to get an understanding of the features of heritage and palaeontological significance in the area. The Impact Assessment phase, however, will include a more detailed field assessment.

An existing database held by the specialist was used to assess the potential presence of sites of heritage, archaeological and palaeontological significance. The database includes information from several provinces, most of the national and provincial monuments and battlefields in Southern Africa (http://www.vuvuzela.com/googleearth/monuments.html) and cemeteries in southern Africa (information supplied by the Genealogical Society of Southern Africa). The database is in Google Earth format and thus used as a quick reference when undertaking desktop studies.

Where available, 1st and 2nd edition 1:50 000 topographical and 1937 aerial photographs are also assessed, to assist in general location and dating of buildings and/or graves.

Where required historical architects, palaeontologists, and historians are also consulted where necessary.

4.2.8 VISUAL / LANDSCAPE

A field survey was undertaken on the 31st May and 13th June 2023. The method used for the study was both desk based (using Google Earth) and a site inspection. Google Earth, the Surveyor General, SANBI, the South African protected and Conservation Areas Database – DFFE, and Environment Geographic Information Systems were used to identify homesteads and structures that may be visually impacted. This information was referenced during the site inspection. The field study entailed travelling along public roads that surrounded and crossed the study area to determine the potential visibility from these areas.

The physical characteristics of the project components were described and illustrated based on information supplied by the EAP. Thereafter, the landscape's character was described and rated in terms of its aesthetic appeal using recognised contemporary research in perceptual psychology as the basis, and its sensitivity as a landscape receptor.

The sense of place of the study area was described as to its uniqueness and distinctiveness. The primary informant of these qualities was the spatial form and character of the natural landscape together with the cultural transformations associated with the historical/current use of the land. Additionally, visibility of the proposed Project was determined using on-site observations and a viewshed assessment.

Lastly, illustrations, in basic simulations, of the proposed WEF and the proposed 132kV powerlines were overlaid onto panoramas of the landscape, as seen from nearby sensitive viewing points, to give the reviewer an idea of the scale and location of the proposed Project within its landscape context. Visual intrusion (contrast) of the proposed Project was determined by simulating its physical appearance from these sensitive viewing areas. The severity and significance of the visual impact of Sheepmoor WEF were rated based on

the method described above and measures to mitigate the negative impacts of Sheepmoor WEF were recommended.

4.2.9 SOCIO-ECONOMIC

The approach to the Scoping Level SIA study is based on the Western Cape Department of Environmental Affairs and Development Planning Guidelines for Social Impact Assessment (February 2007). These guidelines are based on IBP.

In this regard the study involved:

- Review of socio-economic data for the study area;
- Review of relevant planning and policy frameworks for the area;
- Review of information from similar studies, including the SIAs undertaken for other renewable energy projects in the study area;
- Site visit; and
- Identification and assessment of the social issues associated with the proposed project.

Interviews with key stakeholders and I&APs will be undertaken during the assessment phase.

4.2.10 TRAFFIC AND TRANSPORTATION

A desktop study and site visit were conducted to understand the existing receiving environment of the proposed Project site. The site was then evaluated based on its advantages and disadvantages in terms of traffic and transportation, particularly relative to available access and infrastructure of the existing road network.

The potential traffic and transport related impacts were then identified for future assessment and the data collection and consultation requirements for the full Impact Assessment were determined. This information can be used as input into the wider scoping assessment and evaluation of the sites from the perspective of other disciplines, for the selection of the final site.

5. DESCRIPTION OF BASELINE ENVIRONMENT

To evaluate the potential E&S impacts, information relating to the existing environmental conditions or baseline environment is collected through field and desktop research. The baseline environment also extends into the future, although predictions of any changes can involve a high number of variables and may be subject to potentially large uncertainties. As a result, in most cases, the baseline is assumed to remain unchanged throughout the operation of the development. Where this is not the case, this is stated.

The baseline environment has been used to identify any potential sensitive receptors on and near the site, and it is used to assess what changes may take place during the construction, operation and decommissioning phases of the development and the effects, if any, that these changes may have on these receptors.

Within each technical assessment, data is collected from public records and other archive sources and where appropriate, extensive field surveys are carried out. The timing/seasonality of the work within the study area is also outlined within each assessment where applicable.

5.1 REGIONAL AND LOCAL CONTEXT

The study area is located within the Msukaligwa Municipality (MM) within the Mpumalanga Province (Figure 1-1). The MM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality (GSDM).

The MM is a Category B municipality, established in 2001 following the completion of the demarcation process and first democratic local government election in 2000.

It is one of the seven local municipalities in Gert Sibande District Municipality. It was an amalgamation of the erstwhile Ermelo Transitional Council (TLC), Breyten TLC, Chressiemeer Transitional Rural Council (TRC), Lothair TRC, Davel TRC and Sheepmoor TRC.

5.2 TOPOGRAPHY AND TERRAIN

A gently to moderately undulating landscape is present on the Highveld plateau supporting short to medium-high, dense, tufted grassland. Where it has not been disturbed scattered small wetlands, narrow stream alluvia, pans and occasional ridges or rocky outcrops are present.

5.2.1 LANDSCAPE OF THE PROJECT AREA OF INFLUENCE

The Project Area of Influence (PAOI) is situated in the Grassland Biome and comprises predominantly Eastern Highveld Grassland vegetation. The landscape associated with this vegetation consists of slight to moderately undulating plains with small scattered rocky outcrops. The vegetation is short, dense grassland (Mucina and Rutherford 2006). Wakkerstroom Montane Grassland occurs in the middle of the PAOI, on low mountains and undulating plains.

Here the vegetation comprises of short montane grassland on plateaus and flat areas. On steep, east facing slopes and in drainage areas, short forest and thicket occurs. Both vegetation types are endemic, and Eastern Highveld Grassland is classified as Vulnerable while Wakkerstroom Montane Grassland is classified as Least Concern (SANBI 2018). The PAOI includes some low hills and wetland depressions and has largely been transformed by cultivation in the west, commercial forestry in the east and urban sprawl, including extensive areas of alien invasive trees. The PAOI is in a summer rainfall region and has a cool-temperate climate with dry winters, frequent occurrence of frost and large differences in both diurnal and seasonal temperature extremes (Mucina and Rutherford 2006).

Critical Biodiversity Areas (CBA), areas of high biodiversity value that must be maintained in a natural state, are located throughout the PAOI, classified as either "CBA Irreplaceable" and "CBA Optimal". The former category comprises:

- Areas required to meet conservation targets and those with irreplaceability values greater than 80 %;
- Areas which represent critical linkages or pinch-points in the landscape that must remain natural; and
- Critically Endangered ecosystems (MTPA 2014).

The latter category comprises areas that are not 'irreplaceable', but they are the most optimal land configuration to meet all biodiversity targets. Ecological Support Areas (ESA), not essential for meeting biodiversity targets but important in supporting the functioning of CBAs and delivering important ecosystem services, are also located throughout the PAOI.

The south of the PAOI falls within a National Protected Areas Expansion Strategy (NPAES) Focus area (Moist Escarpment Grasslands), targeted for protected area expansion for improved ecosystem representation, ecological sustainability and resilience to climate change. Chrissiesmeer Protected Environment and Jericho Dam Nature Reserve overlap the north and east of the PAOI respectively.

5.3 CLIMATE CONDITIONS

Msukaligwa Municipality falls under the central Mpumalanga climatic zone characterized by warm, rainy summers and dry winters with sharp frosts. Rainstorms are often violent (up to 80mm per day) with severe lightning and strong winds, sometimes accompanied by hail. The winter months are droughty with the combined rainfall in June, July and August making up only 3.9% of the annual total (734mm). The average daily maximum temperature in January (the hottest month) is 25.2°C and in July (the coldest month) is 16.7°C. Due to its position near the escarpment, the area is somewhat windier than is typical for the South - Eastern Mpumalanga Highveld, although the majority of winds are still light, and their direction is controlled by topography.

The Sheepmoor WEF is in a summer rainfall region and has a cool-temperate climate with dry winters, frequent occurrence of frost and large differences in both diurnal and seasonal temperature extremes (Mucina and Rutherford 2006).

Error! Reference source not found. below indicates the climatic conditions of the proposed Sheepmoor Wind Energy Facility.

TABLE 5.1: CLIMATIC CONDITIONS OF THE PROPOSED SHEEPMOOR WEF

	Parameter	Value
Climate	Köppen-Geiger climate description (Beck et al, 2018)	Temperate, dry winter, hot summer
	Mean Annual Rainfall (mm) (Schulze, 2009)	604
	Reference Crop Evaporation Annual Total (mm) (Schulze, 2009)	1205
	Climate capability classification (out of 9) (DAFF, 2017)	6 (moderate-high)

5.4 GEOLOGY

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

5.5 SOILS, LAND USE AND AGRICULTURAL POTENTIAL

The site falls within an area that is classified as a Protected Agricultural Area. A Protected Agricultural Area is a demarcated area in which the climate, terrain, and soil are generally conducive for agricultural production and which, historically, has made important contributions to the production of the various crops that are grown across South Africa. Within Protected Agricultural Areas, the protection, particularly of arable land, is considered a priority for the protection of food security in South Africa. However, there may be much variation within a Protected Agricultural Area and all land within it is not necessarily of sufficient agricultural potential to be suitable for crop production, due to site-specific terrain, soil, and other constraints. All land within a Protected Agricultural Area is therefore not necessarily worthy of prioritised protection as agricultural production land.

5.6 NOISE

Ambient sound levels were measured over a 2-night period from 7th to 9th June 2023 at six locations in the vicinity of the WEF, resulting in more than 900 daytime and 500 night-time measurements. Each measurement was collected over a 10-minute period and included a number of sound level descriptors, including; equivalent values, minimum and maximum levels, statistical sound levels as well as spectral information. Confidence levels in the resulting data are high and it is expected that the ambient sound level data would be applicable of other locations in the area.

Bird communication noises were significant and generally dominant, with some sounds from domestic animals (dogs, cows, sheep and chickens) audible at times.

Considering the average fast-weighted sound level data collected in the area:

- daytime fast-weighted sound levels ranged from 24 to more than 70 dBA, with average daytime sound levels being 43.3 dBA. This is typical of a rural noise district and considering the developmental character, a rating level of 45 dBA (typical of a rural noise district) will be assumed for the daytime period; and
- night-time fast-weighted sound levels ranged from 21 to more than 58 dBA, with average night-time sound levels being 37.3 dBA. This is typical of a rural to suburban noise district, with a typical rating level of 35 dBA.

5.7 FRESHWATER AND WETLANDS (AQUATICS)

The proposed Sheepmoor WEF is located in a portion of the Inkomati-Usuthu Water Management Area, within the upper catchment of the Usuthu River (SQ W54A), while the remainder of the WEF and proposed grid connection options are located in the Upper Vaal River (SQ C11A & C11B) in the Vaal Water Management Area (Figure 4). Thus, several permanent rivers and a variety of wetland hydrogeomorphic types are anticipated both associated with the riverine valleys and bench or plateaux areas located between river valleys on higher lying areas.

The study region is further characterised by several National Biodiversity Assessment (2018) Wetland Clusters, National Freshwater Ecosystem Area (NFEPAs) and Strategic Water Resources Areas.

The geology is mostly shales or sandstone of the Vryhied Group, with several intrusions associated with dolerite sills and dykes in areas associated with the Karoo Supergroup. This typically allows for the development of riverine areas, some with floodplains, interspersed by the rocky inselbergs and small ridges and or bench / plateaus observed.

Overall, these catchment and subsequent rivers / watercourses and wetlands range from a Largely Natural to transformed states. Current impacts occur in localised areas and included the following:

- Mining;
- Large scale farming;
- Forestry;
- Erosion due small road crossings and tracks;
- Grazing; and
- Small to large river impoundments, and off channel farm dams.

In terms of the National Freshwater Ecosystems Priority Areas (NFEPA) assessment, all the watercourses within the site have been assigned a condition score of C (Nel et al. 2011), indicating that they are Moderately Modified, but still have biological significance, while the NBA (2018) data indicated that most mainstem system near the WEF, had a River Conservation Score of B (Usuthu) and B on the Vaal River. These scores were substantiated by observations made in the field within the study area, and due to the impacts or disturbance observed these scores would be upheld. The final EIA report will

be supplied with more detailed analysis of the respective systems once the proposed layout has been refined, as there are just too many systems to assess individually at this stage.

Any ratings will the also be substantiated with an assessment of the study area catchments linked to Critical Biodiversity Areas (CBA) and Ecological Support Areas, as shown in the Mpumalanga CBA spatial data.

The National Freshwater Ecosystems Priority Areas (NFEPA) (Nel et al., 2011), also earmarked sub-quaternaries, based either on the presence of important biota (e.g. rare or endemic fish species) or conversely the degree of riverine degradation, i.e. the greater the catchment degradation the lower the priority to conserve the catchment. The important catchments areas are then classified as Freshwater Ecosystems Priority Areas (FEPAs). The study area falls within several FEPA and Upstream FEPA catchments associated with the Usuthu & Vaal river systems. This is large due to the presence of several important fish and aquatic invertebrate habitats that as well as the provision and maintenance of flows within the lower catchments.

FIGURE 5-1 PROJECT LOCALITY MAP INDICATING THE VARIOUS QUATERNARY CATCHMENT BOUNDARIES (ORANGE DOTTED LINES) IN RELATION TO THE STUDY AREA (SOURCE DWS AND NGI).

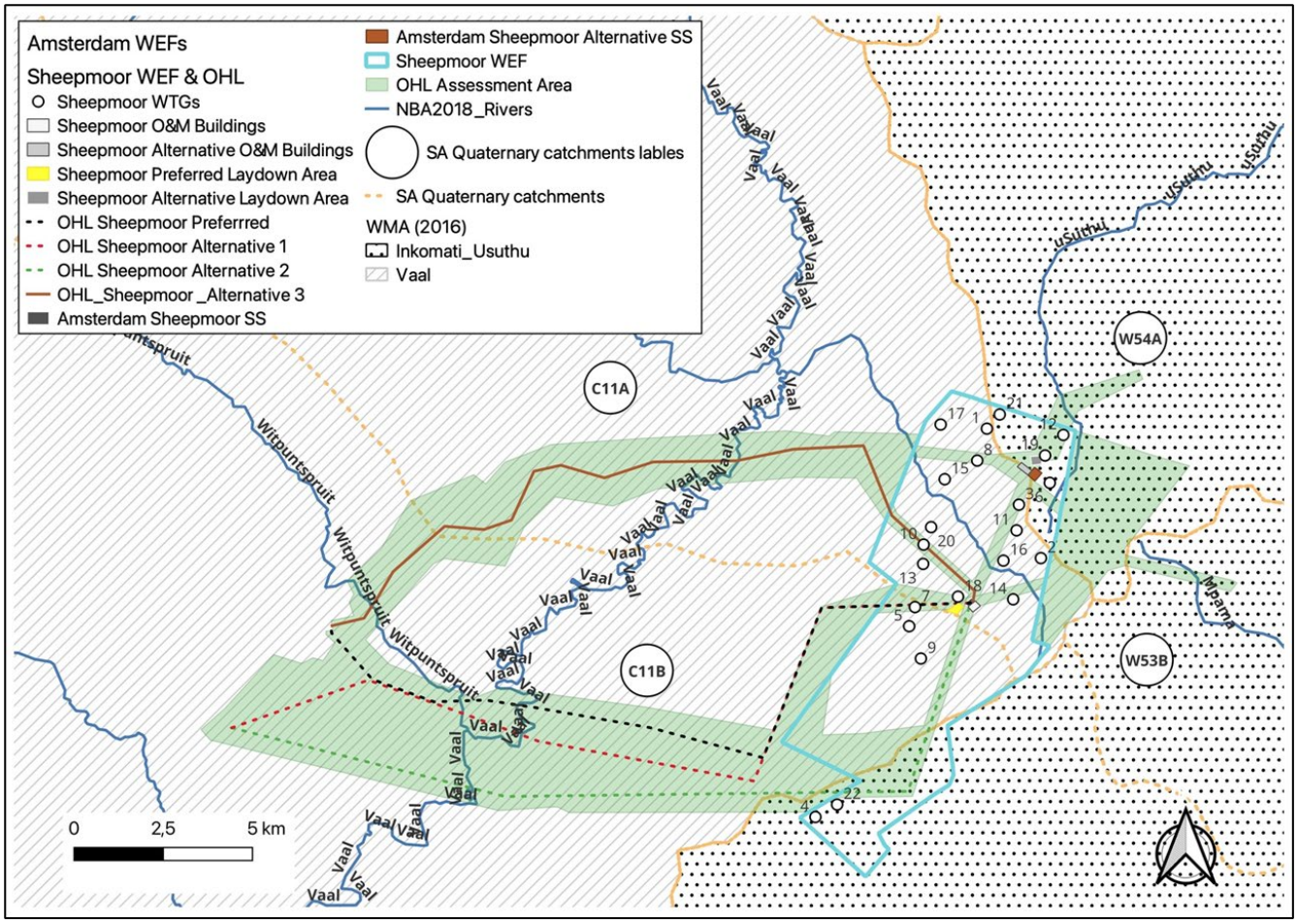
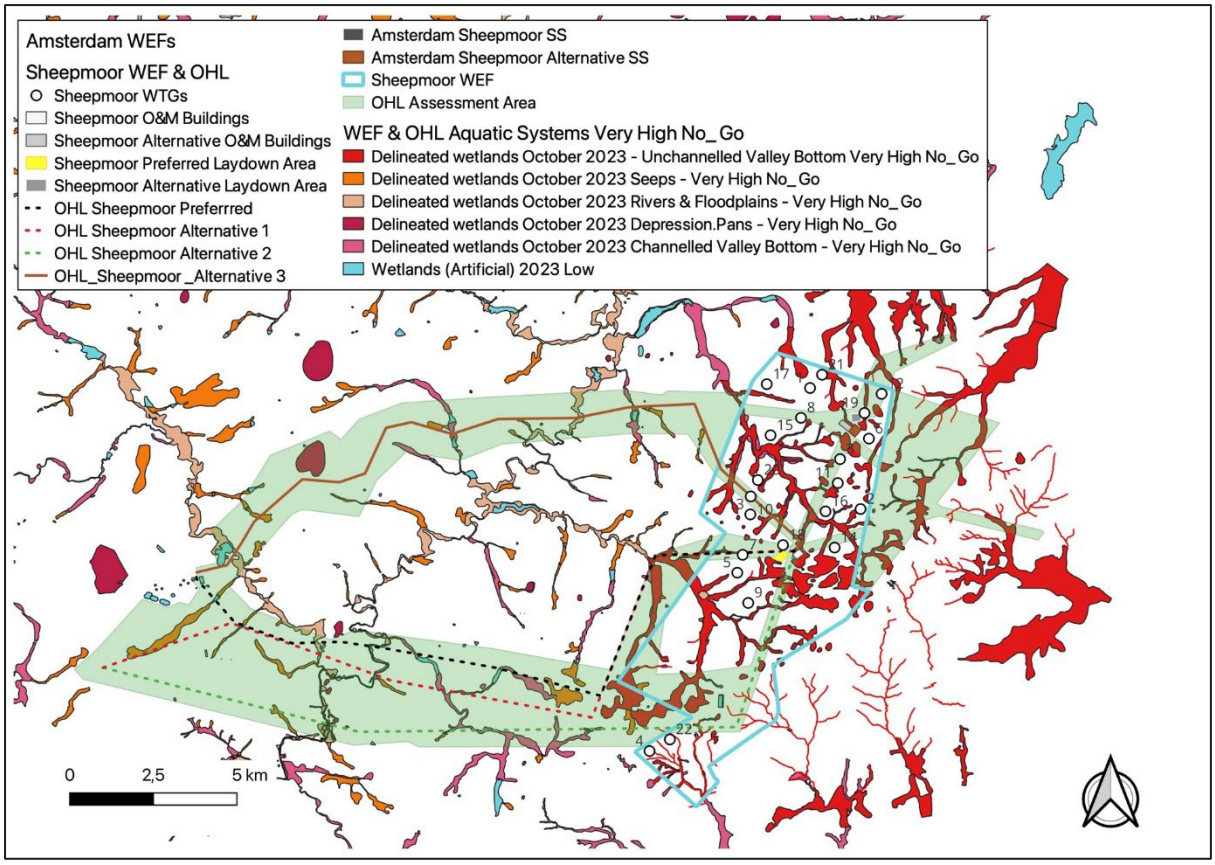


FIGURE 5-2 THE CONFIRMED WATERCOURSES AND WETLANDS WITHIN THE STUDY AREA



5.8 TERRESTRIAL BIODIVERSITY (FLORA AND FAUNA)

Flora – Vegetation Types

Several threatened or protected, endemic and range restricted species are known from the surrounding area. Due to the localised nature of the impact, as well as the level of degradation of the site, the risk of a species suffering any significant loss is low to medium.

The site falls within the general distribution range of several endemic species and other SCC, some with a highly localised distribution and/or some of which may be Critically Endangered, Endangered, Vulnerable or Rare. Some of these species are also only from a single or a few populations. As per Table 5.2:, Critically Endangered flora species are likely not present, but two Endangered species are known to occur in the vicinity.

Seasonal site verification will be required to confirm presence or absence, which may include follow up at final walkdown stage for micro-siting. Sensitive species names have not been included as per reporting protocols.

TABLE 5.2: FLORA INCLUDING SPECIES OF SPECIAL CONCERN (ENDANGERED SPECIES IN BOLD) FLAGGED FOR THE WEF SITE AND GRID CONNECTION ROUTE

Scientific Name	Family	Status	Comment/Presence
Asparagus fractiflexus	Asparagaceae	EN A2c; B1ab(iii)	Possibly present, nearby records
Aspidoglossum xanthosphaerum	Apocynaceae	VU D2	Possibly present, nearby records
Gerbera aurantiaca	**Asteraceae**	**EN A2ac**	**Possibly present, nearby records**
Indigofera hybrida	Fabaceae	VU D2	Possibly present, nearby records
Khadia alticola	Aizoaceae	Rare	Possibly present, within range but no confirmed records nearby.
Khadia carolinensis	Aizoaceae	VU A3c	Possibly present, nearby records
Lotononis amajubica	Fabaceae	Rare	Possibly present, nearby records
Pachycarpus suaveolens	Apocynaceae	VU B1ab(iii)	Possibly present, within range but no confirmed records nearby.
Sensitive species 1201		VU B1ab(i,ii,iii,iv,v)	Possibly present, nearby records
Sensitive species 1219		VU B1ab(iii)+2ab(iii), PNCO	Possibly present, within range but no confirmed records nearby.
Sensitive species 1252		VU A2cd, PNCO	Possibly present, within range but no confirmed records nearby.
Sensitive species 321		Rare, PNCO	Possibly present, within range but no confirmed records nearby.
Sensitive species 41		VU B1ab(i,ii,iii,iv,v)+2ab(i,ii,iii,iv,v)	Possibly present, nearby records
Sensitive species 691		VU B1ab(ii,iii,v)	Possibly present, within range but no confirmed records nearby.

Sensitive species 851		VU B1ab(iii)	Possibly present, within range but no confirmed records nearby.
Sensitive species 998		**EN A2bd**	**Possibly present, within range but no confirmed records nearby.**
Zaluzianskya distans	Scrophulariaceae	Rare	Possibly present, within range but no confirmed records nearby.

Fauna – Mammals (Ourebia ourebi ourebi (Zimmermann, 1783) Oribi

The Oribi (Ourebia ourebi) is a small, territorial antelope that occurs throughout sub-Saharan Africa where it typically inhabits open temperate grasslands. Thirteen subspecies are currently recognised, with the South African subspecies O. ourebi ourebi recognised as genetically distinct from other subspecies to the north. As such, oribi in South Africa should be managed as a distinct conservation unit (Jansen van Vuuren, Rushworth and Montgelard, 2017).

It has a 2016 Regional Red List Status of Endangered C2a(ii) and is considered as the most threatened antelope species in South Africa with a minimum estimated total of approximately 2000 mature individuals remaining (Conservation Breeding Specialist Group Southern Africa et al., 2006; Shrader et al., 2016). Ourebia ourebi ourebi populations have become restricted to small, isolated populations in grasslands in the eastern half of South Africa, occurring in grasslands in Mpumalanga, Eastern Cape and KwaZulu-Natal provinces. A few subpopulations in southern and north-eastern Free State, and southern Limpopo are also known.

Fragmentation of populations and declining population numbers (~13% decline between 1996-2014) are the result of several anthropogenic factors, including hunting and poaching, habitat loss and fragmentation, and poor veld management (e.g., fencing, burning, overgrazing). Habitat requirements include both short grass for food and long grass for food and shelter. They are selective feeders with several species of grass making up most of their diet, (*Themeda triandra*, *Hyparrhenia hirta*, *Panicum natalense*, and *Andropogon chinensis*) (Shrader et al., 2016).

They also appear to favour north and east facing slopes, with populations showing preferences for gentle slopes (less than ~10 degrees), gentle undulating plateaus, ridge tops, and spurs, and avoiding lowland areas (Conservation Breeding Specialist Group Southern Africa et al., 2006). Further loss of grasslands on flat and undulating terrain is considered a very real threat to the survival of this charismatic sub-species.

Recent postings on iNaturalist indicate that Oribi are relatively frequently encountered within the broader grassland areas around the project site. For example, a 2020 photographic record form approximately 75km south in Wakkerstroom Montane Grassland, a vegetation type found at the project site.

Additionally, the habitats and microhabitats present on the project site are not unique and although highly fragmented, are widespread in the broader area, hence the local impact associated with the footprint would be of low significance if mitigation measures are adhered to. The site falls within the general distribution range of several flagged faunal species.

Table 5.3:Endangered or Critically Endangered terrestrial fauna species are flagged to potentially be present in the project site (Table 5.3:). The site falls within the potential distribution range of a few faunal species of concern. No further avifaunal investigations by the project ecologist, as these will be undertaken by the project avifaunal specialist, but the single mammal and insect species that is flagged both have significantly more widespread distribution than the site. Since the project footprint is likely to be relatively contained, any disturbance or displacement associated with habitat destruction as a direct result of the activity is unlikely to pose a significant negative impact to terrestrial faunal species above background disturbance levels that are already present. Seasonal assessments of the fauna recommended for clarification of risk.

Reptiles

Reptiles such as lizards, snakes and tortoises may be present. Site survey and assessment would be required to confirm, however no specific species flagged.

Amphibians

Amphibians are likely to be present due to the prevalence of watercourses and wetlands. Site assessment would be required to confirm, however no specific species flagged.

Invertebrates - Clonia lalandei (Saussure, 1888) Lalande's Black-winged Clonia

This species of katydid is endemic to South Africa and has an IUCN Red List Category and Criteria of Vulnerable B1ab(i,iii) (Bazelet and Naskrecki, 2014). Within South Africa, the species has a broad distribution occurring across the central parts of South Africa, having been recorded from the Free State, KwaZulu-Natal, and Mpumalanga Provinces. It occurs in grassland and savanna habitats but has only been collected from four localities with almost nothing known about its specific habitat requirements or ecology.

It has an estimated extent of occurrence of 15,397 km2 and its estimated geographic range falls just outside of the project area, approximately 12 km to the east (Bazelet and Naskrecki, 2014). The species has not been recorded in the project area; the closest known record is approximately ~92 kms north-east for a specimen collected from Barberton Montane Grassland habitat.

TABLE 5.3: FAUNA SPECIES OF SPECIAL CONCERN

Scientific Name	Common Name	Status	Comment/Presence
Mammals			

Crocidura maquassiensis	Makwassie musk shrew	VU, NEST (M)	Possibly present, within range but no confirmed records nearby.
Ourebia ourebi ourebi	Oribi	EN, NEST (M)	Possibly present, within range but no confirmed records nearby. May be a transient species to the site, unlikely to be significantly affected by the proposed WEF due to dispersed nature of layout and suitable available habitat in the area,
Birds			
Balearica regulorum	Grey Crowned Crane	EN, NEST (H)	Refer to Avifaunal Assessment
Eupodotis senegalensis	White-bellied Bustard / Korhaan	VU, NEST (H, M)	Refer to Avifaunal Assessment
Hydroprogne caspia	Caspian Tern	VU, NEST (M)	Refer to Avifaunal Assessment
Sagittarius serpentarius	Secretary Bird	VU, NEST (H, M)	Refer to Avifaunal Assessment
Tyto capensis	African Grass Owl	VU, NEST (M)	Refer to Avifaunal Assessment
Geronticus calvus	Southern Bald Ibis	VU C1+2a(ii), NEST (H, M)	Refer to Avifaunal Assessment
Neotis denhami	Denhams Bustard	NEST (M)	Refer to Avifaunal Assessment
Reptiles			
None of concern	-	-	-
Amphibians			
None of concern	-	-	-
Invertebrates			
Clonia lalandei	Lalande's Black-winged Clonia	VU B1ab (i, iii)	Possibly present, within range but no confirmed records nearby.

The project area bisects large fragments of both natural vegetation, particularly of grassland escarpment, and areas of habitat that have been moderately to heavily transformed over several decades. Most of the project area falls across an ecosystem type with a South African Red List of Ecosystems Status of Least Concern. Importantly, most of this area still retains its natural extent and represents a large contiguous, and most likely an ecologically functional area of montane grassland. Smaller areas have a Red List of

Ecosystems Status of Endangered and that also still retain their natural extent (Figure 5) (South African National Biodiversity Institute and Department of Forestry, 2021).

The conservation importance of these areas, and several other areas of the project site, are further highlighted in the Mpumalanga Biodiversity Sector Plan (MTPA, 2014a). More than half of the project area is classed as Critical Biodiversity Areas (Irreplaceable and optimal). As detailed in Lotter, (2015), CBAs are required to meet biodiversity targets for species and ecosystems and ecological processes. They should remain in a natural state that is maintained in good ecological condition. CBAs are areas of high biodiversity value and include Critically Endangered Ecosystems and critical linkages (ecological corridors). Irreplaceable CBAs are recognised as the most important biodiversity areas in the Mpumalanga Province and are considered essential for meeting biodiversity targets. They are at high risk of being lost due to their remaining extent being near to or lower than the required biodiversity target. If Irreplaceable CBAs suffer additional losses, it is likely that species losses and breakdown of ecological processes will occur. CBA Optimal areas are the best localities (out of a potentially larger selection of available planning units) that are most optimally located to meet biodiversity targets. These areas have an irreplaceability <80%, and often represent the optimal solution for meeting biodiversity targets. They collectively reflect the most cost-efficient and smallest spatial extent required to meet biodiversity targets.

- The project area falls over an Important Bird Area (IBA): Grasslands (Marnewick et al., 2015). It falls close to two other IBAs. IBAs are areas of high importance for bird conservation and are selected on the presence bird species of global or regional conservation concern; assemblages of restricted-range bird species; assemblages of biome-restricted bird species; and concentrations of numbers of congregatory bird species.

5.9 AVIFAUNA

5.9.1 NATURAL ENVIRONMENT

The WEF and Grid Connection Project Site is situated in the Grassland Biome, in the Mesic Highveld Grassland Bioregion (Mucina & Rutherford 2006). The proposed site is comprised of undulating grassland plains, with small, scattered patches of dolerite outcrops in areas, low hills, pan depressions and drainage lines with extensive associated wetland areas. Vegetation on site consists predominantly of Wakkerstroom Montane Grassland and Eastern Highveld Grassland. Wakkerstroom Montane Grassland comprises predominantly short montane grasslands on the plateaus and the relatively flat areas, with short forest and Leucosidea (ouhout) thickets occurring along steep, mainly east-facing slopes, and drainage areas (Mucina & Rutherford 2006). Eastern Highveld Grassland vegetation is comprised of a short, closed grassland cover, largely dominated by a dense Themeda triandra sward, often severely grazed to form a short lawn (Mucina & Rutherford 2006). The black wattle Acacia mearnsii is an aggressive invader of riparian areas. Stands of alien Eucalyptus and Pinus species are scattered throughout the proposed development area.

Ermelo has a temperate climate. January is the warmest month with a maximum temperature of 24 C°. June and July are the coldest months, with a minimum temperature of 0.2 C°. The driest month is June with an average of 3 mm of precipitation. Most of the precipitation falls in December, averaging 151 mm. The average annual precipitation is around 756 mm (Climate – data.org 2021). The topography in the project area is characterised by gentle undulating plains. The predominant land use for this area is livestock grazing with some crop farming, mostly maize, soya beans and pastures. The livestock in the study area is a combination of mostly sheep and cattle, with a few horses.

5.9.2 MODIFIED ENVIRONMENT

Whilst the distribution and abundance of the bird species in the Broader Area are mostly associated with natural vegetation, as this comprises virtually all the habitat, it is also necessary to examine the few external modifications to the environment that have relevance for birds.

The following avifaunal-relevant anthropogenic habitat modifications were recorded within the Broader Area:

- Surface Water: The Sheepmoor WEF Project Site and Grid Connection PAOI contains several man-made sources of surface water such as ground dams and boreholes. These sources of water are important for birds for drinking and bathing.
- Alien Trees: There are clumps and stands of alien trees throughout the WEF Project Site and Grid Connection PAOI. Alien trees could attract a variety of bird species for the purposes of nesting and roosting.
- Agriculture: The predominant land use for this area is livestock grazing with some crop farming, mostly maize, soya beans and pastures. Birds could be attracted to these areas in search of food.

5.9.3 IMPORTANT BIRD AREAS (IBAS)

The WEF Project Site is less than 1km from an Important Bird Area (IBA) and the Grid Connection partially overlaps with the same IBA, namely the Grasslands IBA SA020. Due to the proximity of the IBA, it is possible that some priority species that are also IBA trigger species, and occur either permanently or sporadically in the IBA, might be impacted by the project. Species recorded in the Broader Area that fall in this category include the following:

- Secretarybird;
- Pied Avocet;
- Denham's Bustard;
- Blue Crane;
- Grey Crowned Crane;
- Wattled Crane;
- White-backed Duck;
- Yellow-billed Duck;

- Martial Eagle;
- Lanner Falcon;
- Greater Flamingo;
- Lesser Flamingo;
- Black-necked Grebe;
- Little Grebe;
- African Marsh Harrier;
- Black Harrier;
- Southern Bald Ibis;
- African Grass Owl;
- Southern Pochard;
- Cape Shoveler; and
- White-winged Tern.

5.9.3.1 NO-GO AREAS

- A 2.5km No-Go zone (for all infrastructure) around the identified Martial Eagle nest should be implemented and maintained to reduce the risk of collision mortality and displacement due to disturbance. However, the Martial Eagle nest turbine no-go buffer is currently being investigated further with detailed modeling and additional survey work focused on Martial Eagle. This investigation will form part of the EIA phase specialist work, and the final exclusion area confirmed during the EIA phase.
- All wetland No-Go areas as identified by the Aquatic Specialist should be buffered by an additional 110m on either side to reduce the risk of turbine collisions and to prevent the disturbance of priority species breeding and roosting in these areas. Priority species in this category include African Fish Eagle, African Grass Owl, African Marsh Harrier, Black-winged Pratincole, Blue Crane, Grey Crowned Crane, Long-crested Eagle, Marsh Owl, Yellow-billed Stork, and sensitive Species Number 23 (as listed by the National Screening Tool). During the EIA Phase fine scale habitat modelling and identification of wetland corridors for cryptic / low detection probability wetland species will be conducted. Two forms of risk zones will be delineated, namely core breeding habitat, and associated connectivity habitat. Connectivity habitat will include wetland habitats not used for breeding but for movement, as well as wetland/grassland margins. These features will need to be buffered to account for the sensitivity of the respective species involved.
- Modelled Yellow-breasted Pipit and Rudd’s Lark habitat areas are considered No-Go zones. These high-quality grassland areas were identified to prevent displacement of birds due to disturbance and habitat destruction. The Yellow-breasted Pipit and Rudd's Lark model output represents the habitat patches most suitable for the species' using a multi-year assessment of imagery indices etc. spanning 2019–2023. This is to account for variability related to drivers of habitat suitability for grassland habitat specialist species such as these endemic larks and pipit. Primary drivers of variability include seasonal rainfall across years, burning/fire, and grazing intensity. The model

boundaries will extend beyond suitable habitat into other habitats (forest edge, roads, etc.) in some areas as we have accounted for typical blade swept area (BSA) by buffering the habitat output. This output should be considered high sensitivity and avoided (no-go) given habitat loss/degradation is the primary issue. Although Botha's Larks were not observed on site during the extensive surveys conducted further investigations regarding habitat suitability will be conducted through modelling during the EIA phase of the project. This will be done to understand if the proposed development poses any risk to the species.

- There are two Southern Bald Ibis colonies located within the WEF Project Site. A shaped turbine exclusion zone has been delineated based on modelled flight activity. The modelling workflow incorporated all the flight data collected within the area during the pre-construction monitoring. The model identifies high-risk flight areas by considering associations between the underlying habitat and topography in relation to the recorded Southern Bald Ibis flight data and proximity to roosts. Southern Bald Ibis.

Figure 5-3 and Figure 5-4present the avifaunal sensitivities for the proposed development.

FIGURE 5-3 AVIFAUNAL SENSITIVITIES IDENTIFIED FOR THE SHEEPMOOR WEF PROJECT

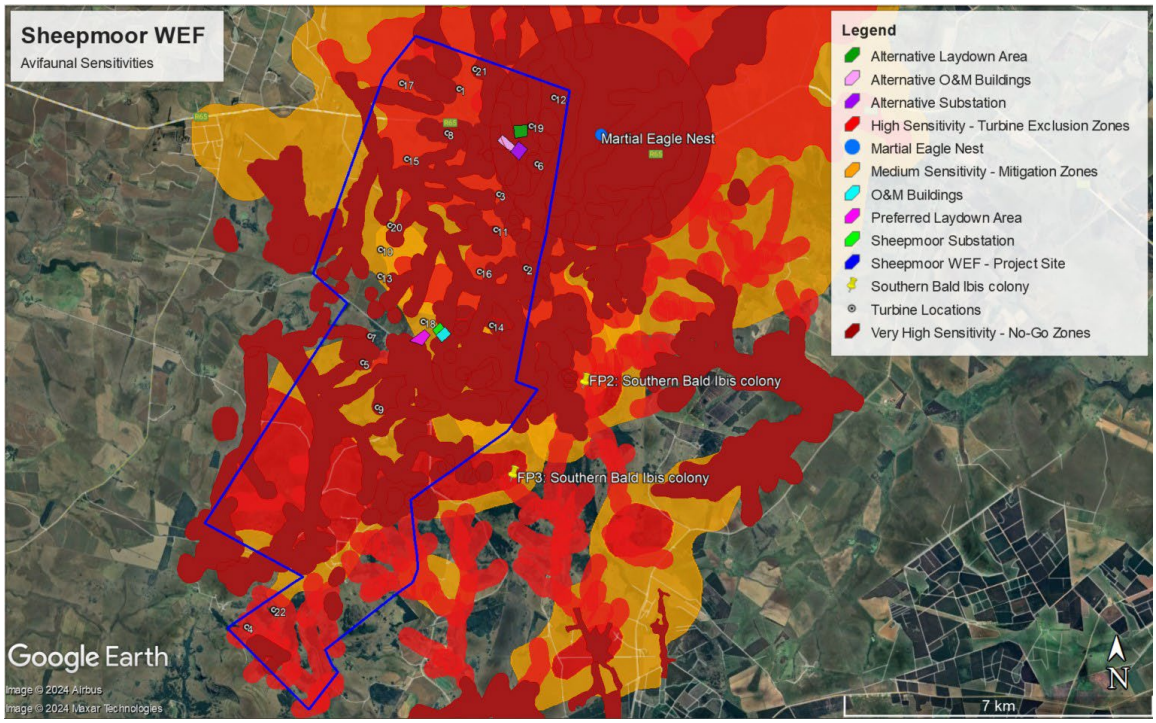
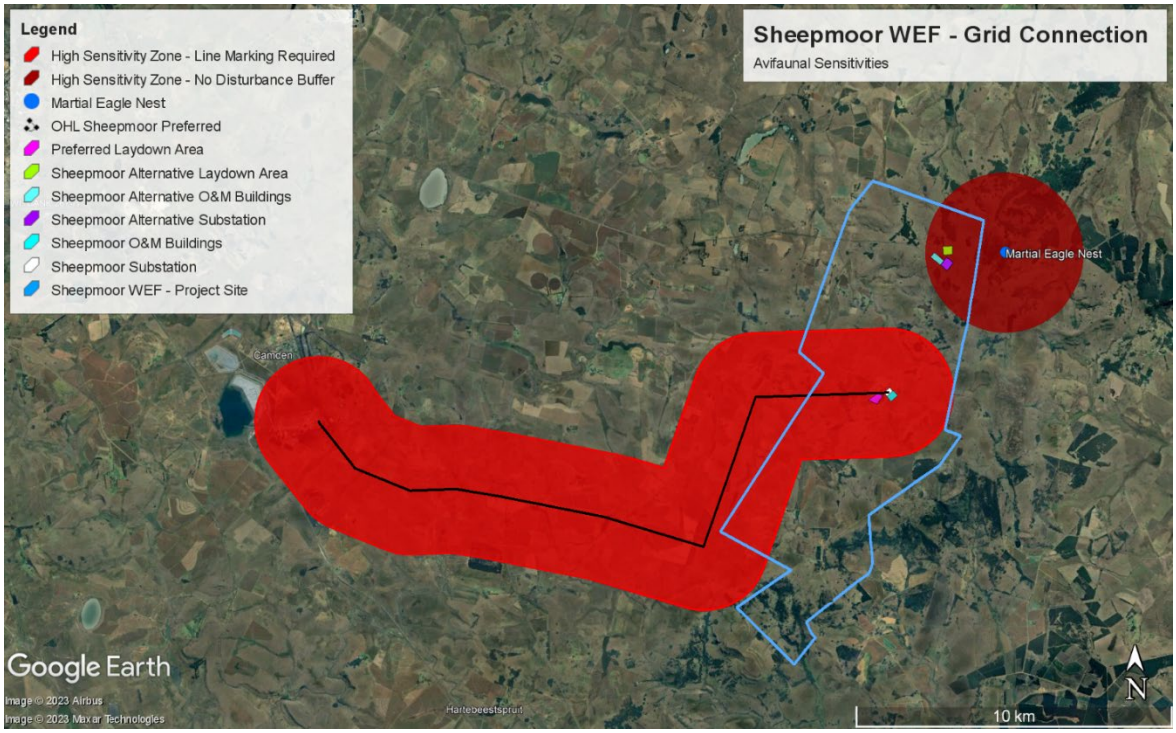


FIGURE 5-4 AVIFAUNAL SENSITIVITIES IDENTIFIED FOR THE SHEEPMOOR GRID CONNECTION.



Note: due to the large amount of wetlands/drainage lines and grassland habitat in the area it is recommended that the entire OHL be fitted with bird flight diverters.

5.10 BATS

Bat roosting sites in the PAOI are relatively limited and unlikely to support large congregations of bats, with no underground sites (e.g., caves, mines, sinkholes) known to be present. The closest known major bat roost is approximately 70 km north of the PAOI. Although occasional ridges and rocky outcrops are features of the landscape (Mucina and Rutherford 2006) these are not extensive. Bats are likely to roost in buildings associated with farmsteads within and bordering the AoI especially Cape Serotine and Egyptian Free-tailed Bat (Monadjem et al. 2020).

Trees growing at these farmsteads and elsewhere on site where they form clumps, could also provide roosting space for bats, as well as the limited rocky outcrops even though most are alien invasive species. Completed surveys of some buildings in the of the PAOI did not reveal the presence of roosting bats and as such were assessed as being of low relative suitability. However, these could be used by bats as night-roosts (locations used by bats to feed on captured prey, or to rest between foraging bouts) and should therefore still be considered, and avoided where possible, in the spatial planning.

Sensitive features in the PAOI at which bat foraging activity may be concentrated include farm buildings where they would forage for insects attracted to lighting (Rydell 1992, Jung and Kalko 2010), dams and wetland areas (Sirami et al. 2013), within and along the edge of woodland/tree patches, and over cultivated areas (Bohmann et al. 2011, Noer et al.

2012). Free-tailed bats (Molossidae) will fly at high altitudes, and their foraging habitat is essentially all airspaces (McCracken et al. 2008, Nguyen et al. 2019).

Based on current taxonomic information and bat occurrence data, 23 species could occur within the PAOI. The majority have a low likelihood of occurrence however the potential suite of species includes 10 high risk species, including fruit bats (Pteropodiae) and free-tailed bats (Molossidae) which are vulnerable to wind energy impacts in South Africa (MacEwan 2016, Aronson 2022).

TABLE 5.4: BAT SPECIES POTENTIALLY OCCURING WITHIN THE SHEEPMOOR WEF PAOI

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk[δ]
			IUCN	RSA[ι]	
Natal Long-fingered bat *Miniopterus natalensis*	Temperate or subtropical species. Primarily in savannahs and grasslands. Roosts in caves, mines, and road culverts. Clutter-edge forager. Migratory.	**Confirmed (4,420 passes)**	LC/U	LC	High
Lessor Long-fingered bat *Miniopterus fraterculus*	Temperate species, associated with grasslands. Cave-dependant but also roosts in tunnels and mines. Habitat includes savannah bushveld, moister mistbelt and coastal forest habitats. Clutter-edge forager. Migratory.	Moderate	LC/U	LC	High
Cape Serotine *Laephotis capensis*	Arid semi-desert, montane grassland, forests, savannah and shrubland. Roosts in vegetation and human-made structures.	**Confirmed (45,125 passes)**	LC/S	LC	High

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk[δ]
			IUCN	RSA[ι]	
	Clutter-edge forager.				
Mauritian tomb bat *Taphozous mauritianus*	Savannah woodland preferring open habitat. Roosts on rock faces, the outer bark of trees or on the outer walls of buildings under the eaves of roofs. Forages in urban areas and over cultivation. Open- air forager.	High	LC/U	LC	High
Little Free-tailed bat *Chaerephon pumilus*	Semi-arid savannah, forested regions, woodland habitats. Roosts in narrow cracks in rock and trees but also in buildings. Open-air forager. Forages in urban areas and over cultivation.	**Confirmed (1,216 passes)**	LC/U	LC	High
Midas Free-tailed bat *Mops midas*	Hot low-lying savannah and woodland. Roosts in narrow cracks in rock and trees but also in buildings. Open-air forager.	Low	LC/D	LC	High
Egyptian Free-tailed bat *Tadarida aegyptiaca*	Desert, semi-arid scrub, savannah, grassland, and agricultural land. Roosts in rocky crevices, caves, vegetation, and human-made	**Confirmed (18,842 passes)**	LC/U	LC	High

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk[δ]
			IUCN	RSA[ł]	
	structures. Open-air forager.				
Wahlberg's Epauletted fruit bat *Epomophorus wahlbergi*	Roost in dense foliage of large, leafy trees. Associated with forest and forest-edge habitats but will forage in urban environments.	Low	LC/S	LC	High
African Straw-coloured fruit bat *Eidolon helvum*	Non-breeding migrant in the PAOI.	Low	NT/D	LC	High
Egyptian Rousette *Rousettus aegyptiacus*	Distribution influenced by availability of suitable caves roosts.	Low	LC/S	LC	High
Temminck's Myotis *Myotis tricolor*	Montane forests, rainforests, coastal forests, savannah woodlands, arid thicket, and fynbos. Roosts communally in caves (and mines) and closely associated with mountainous terrain. Migratory. Clutter-edge forager.	Low	LC/U	LC	Medium- High
Welwitsch's Myotis *Myotis welwitschii*	Mainly open woodland and savannah but also high-altitude grassland, tropical dry forest, montane tropical	Low	LC/U	LC	Medium- High

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk[δ]
			IUCN	RSA[ι]	
	moist forest, savannah and shrublands. Clutter-edge forager.				
Yellow-bellied house bat *Scotophilus dinganii*	Occurs throughout the Savannah Biome but avoids open habitats such as grasslands and Karoo scrub. Roosts in hollow trees and buildings. Clutter-edge forager.	**Confirmed (165 passes)**	LC/U	LC	Medium- High
Dusky Pipistrelle *Pipistrellus hesperidus*	Woody habitats, such as riparian vegetation and forest patches. Recorded roosting in narrow cracks in rocks and under the loose bark of dead trees. Clutter-edge forager.	Low	LC/U	LC	Medium- High
Rusty Pipistrelle *Pipistrellus rusticus*	Savannah woodland and associated with open water bodies. Roosts in trees and old buildings. Clutter-edge forager.	Low	LC/U	LC	Medium- High
Long-tailed Serotine *Eptesicus hottentotus*	Montane grasslands, marshland and well- wooded riverbanks, mountainous terrain near water. Roosts in caves, mines, and	**Confirmed (239 passes)**	LC/U	LC	Medium

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk[δ]
			IUCN	RSA[ł]	
	rocky crevices. Clutter-edge forager.				
Egyptian Slit-faced bat *Nycteris thebaica*	Savannah, desert, arid rocky areas, and riparian strips. Gregarious and roosts in caves but also in mine audits, Aardvark holes, rock crevices, road culverts, roofs, and hollow trees. Clutter forager.	Medium	LC/U	LC	Low
Geoffroy's Horseshoe bat *Rhinolophus clivosus*	Savannah woodland, shrubland, dry, riparian forest, open grasslands, and semi- desert. Roosts in caves, rock crevices, disused mines, hollow baobabs, and buildings. Clutter forager.	Medium	LC/U	LC	Low
Bushveld Horseshoe bat *Rhinolophus simulator*	Occurs in caves within areas of moist savannah, adjacent to rivers and savannah woodland, montane habitats, and coastal mosaics. Commonly associated with riparian forest and along wooded drainage lines. Roosts in caves and mines. Clutter forager.	Medium	LC/D	LC	Low

Common Name Species Name	Key Habitat Requirements*	Prob. Of Occurrence	Conservation Status		Wind Energy Risk$^{\delta}$
			IUCN	RSA$^{!}$	
Blasius's Horseshoe bat *Rhinolophus blasii*	Savannah woodlands and are dependent on the availability of daylight roosting sites such as caves, mines, or boulder piles. Clutter forager.	Low	LC/D	NT	Low
Darling's Horseshoe bat *Rhinolophus darlingi*	Mesic woodland savannahs. Roosts in caves, boulder piles, mines, culverts, large hollow trees and disused buildings. Clutter forager.	Low	LC/U	LC	Low
Sundevall's Leaf-nosed bat *Hipposideros caffer*	Savannah, bushveld and/or coastal forests, near to rivers and other water sources. Roosts in caves, sinkholes, rock fissures, hollow trees, mines, and culverts. Clutter forager.	Low	LC/D	LC	Low
Percival's Short-eared Trident bat *Cloeotis percivali*	Savannah and woodland areas. Roosts in caves and mine tunnels. Clutter forager.	Low	LC/U	EN	Low

*Child et al. (2016), *Monadjem et al. (2020); $^{!}$ Child et al. (2016); †IUCN (2021); $^{\delta}$ MacEwan et al. (2020b)

5.11 SOCIO-ECONOMICS

The study area is located within the MM within the Mpumalanga Province. The MM is one of the seven Local Municipalities that make up the Gert Sibande District Municipality. The town of Ermelo is the administrative seat of the MM.

Three national highways, namely the N2, N11 and the N17 intersect at Ermelo. The N2 freeway connects Ermelo with Richards Bay on the KwaZulu-Natal coastline. The N11 South connects the town to Newcastle to the south and then onto the Ladysmith before linking up with the N3 to Durban. The N11 north connects to Middelburg and the N4 freeway west to Pretoria. The N17 West connects the town to the southern suburbs of Johannesburg and N17 East to eSwatini.

Ermelo is also a major railway junction between Mpumalanga and KwaZulu-Natal. The rail junction connects to Machadodorp which is on the Pretoria and Maputo railway line. The town also lies on the Richards Bay railway line that connects the Mpumalanga coalfields with the export Port of Richards Bay on the Indian Ocean. The N2 and Richards Bay railway line run to the south of the study area. The proposed Sheepmoor WEF project is located to the north of the N2 and south of the R65. The grid connections run in an east west direction linking up with the Camden substation located adjacent to Eskom's Camden Power Station, located ~ 28 km to the west of the study area.

Construction of the 1600 MW power station commenced in November/December 1962 and the first turbo-generator was commissioned in April 1967. The last of the eight units was commissioned in 1969. The Camden Power station became the starting point of the national power grid, consisting of a series of 400 kV lines which today interconnect the entire country. The power station has six 111.86 m high cooling towers and four 154 chimney (smoke stacks) that served 8 boilers. Between 1990 and 2006 the station was mothballed, but South Africa's energy crisis in the early 21st century prompted Eskom to recommission the station, starting with unit 6 in July 2005 and completing with unit 1 in July 2008. The development of the Camden Power station also involved the construction of the village of Camden, located ~ 1.3km to the north of the power station.

As previously stated, the study area is not located within a designated REDZ. No operational renewable energy facilities are currently located within significant proximity of the site. The DFF&E's Renewable Energy applications interactive viewer (last updated February 2022) indicates no historic applications within a 35 km radius of the site. In addition to the three WEFs proposed by Mulilo, two WEFs and a Solar Energy Facility area proposed in the vicinity of the Camden Power Station (Enertrag).

Population

The population of the MM in 2016 was 164 608 (Community Household Survey 2016). Of this total, 35.4% were under the age of 18, 60.4% were between 18 and 64, and the remaining 4.1% were 65 and older. The MM therefore had a high percentage of the population that fall within the economically active group of 18-65. The figures are higher than the figures for the GSDM and Mpumalanga (57.7% and 56.6% respectively). This is likely to be due to the employment opportunities associated with the mining and manufacturing activities in the MM.

The dependency ratio is the ratio of non-economically active dependents (usually people younger than 15 or older than 64) to the working age population group (15-64). The higher the dependency ratio the larger the percentage of the population dependent on the economically active age group. This in turn translates to reduced revenue for local

authorities to meet the growing demand for services. The traditional approach is based people younger than 15 or older than 64. The information provided provides information for the age group under 18. The total number of people falling within this age group will therefore be higher than the 0-15 age group. However, most people between the age of 15 and 17 are not economically active (i.e., they are likely to be at school).

Using information on people under the age of 18 is therefore likely to represent a more accurate reflection of the dependency ratio. Based on these figures, the dependency ratios for the MM, the GSDM and Mpumalanga in 2016 were 65.4%, 73.5% and 77% respectively. The high dependency ratios reflect the limited employment and economic opportunities in the area and the province. As indicated above, a high dependency ratio also places pressure on local authorities in terms of service delivery.

In terms of race groups, Black Africans made up 91.6% of the population on the MM, followed by Whites, 6.9% and Asian or Indians, 0.9%, and Coloureds, 0.6%. This figures for the GSDM are similar. The main first language spoken in the MM was isizulu, 79.1%, followed by Siswati, 7.3% and Afrikaans, 6.2%.

Households and house types

The total number of households in the MM in 2016 was 51 090, which constituted approximately 20% of the total number of households in the GSDM. Of these 66.2% were formal houses, 9.1% flats in backyards, 6.6% traditional dwellings, and 9.4% shacks or informal dwellings. The figures for the GSDM were 67.2%, 4.6%, 6.7% and 13.4% respectively. Majority of dwellings in the MM are therefore formal structures. A relatively large percentage of the properties in the MM (43.3%), while 5.9% were owned and in the process of being paid off. 22.1% of the households rented their properties, while 10.6% occupied their properties rent free. The rent-free figure is likely to be associated with farm workers. The relatively high number of properties that are owned and or in the process of being paid off reflects a relatively stable and established community.

In terms of household heads, approximately 38.9% of the households in the MM and 39.1% of the households in the GSDM were headed by women. These figures are similar to the provincial figure of 39.71%. The high percentage of households headed by women reflects the likelihood that the men have left the area in search of employment opportunities in Gauteng. Women headed households tend to be more vulnerable.

Household income

Based on the data from the 2011 Census, 12.6% of the population of the MM had no formal income, 4.1% earned less than R 4 800, 7.1% earned between R 5 000 and R 10 000 per annum, 17.7% between R 10 000 and R 20 000 per annum and 20.9% between R 20 000 and 40 000 per annum (2016). The poverty gap indicator produced by the World Bank Development Research Group measures poverty using information from household per capita income/consumption. This indicator illustrates the average shortfall of the total population from the poverty line. This measurement is used to reflect the intensity of poverty, which is based on living on less than R3 200 per month for an average sized household (~ 40 000 per annum). Based on this measure, in the region of 62.4% of the

households in the MM and 65.2% in the GSDM live close to or below the poverty line. The low-income levels reflect the rural nature of the local economy and the limited formal employment opportunities outside in the urban areas. This is also reflected in the high unemployment rates. The low-income levels are a major concern given that an increasing number of individuals and households are likely to be dependent on social grants. The low-income levels also result in reduced spending in the local economy and less tax and rates revenue for the MM. This in turn impacts on the ability of the MM to maintain and provide services.

Household income levels are likely to have been impacted by the COVID-19 pandemic. The number of households in the MM and GSDM that live close to or below the poverty line is likely to have increased over the last 18 months. This, coupled with the high dependency ratio, is a major cause of concern for the area.

The official unemployment rate in the MM in 2016 was 15.6%, while 42.6% were employed, and 36.4% were regarded as not economically active. However, the COVID-19 pandemic is likely to have resulted in an increase in unemployment rates in both the ULM and Ward 3. Recent figures released by Stats South Africa also indicate that South Africa's unemployment rate is in the region of 36%, the highest formal unemployment rate in the world.

Education

In terms of education levels, the percentage of the population over 20 years of age in the MM and GSDM with no schooling was 10.6% (2016), compared to 10.8% and 11.3% for the GSDM and Mpumalanga Cape Province. The percentage of the population over the age of 20 with matric was 34.12%, compared to 34.3% and 36.1% for the GSDM and Mpumalanga. The education levels for the MM are therefore similar to the DM and Provincial figures

5.12 HERITAGE, ARCHAEOLOGY AND PALAEONTOLOGY

According to a desktop PIA undertaken by Alan Smith Consulting (2023) for the proposed Sheepmoor WEF:

> "*The SAHRIS Palaeosensitivity Map ... considers the Vryheid Formation as a Very High Palaeosensitivity Zone... In practise, no vertebrate fossils have been recorded from the Vryheid Formation in this area, however invertebrate trace fossils are common (Tavener Smith et al, 1989; Mason and Christie, 1985; Hastie et al., 2019), but these are of no particular value, in this area.*
>
> *Groenewald (2018) pointed out that the aquatic marine reptile, Mesosaurus (earliest known reptile from the Karoo Basin), as well as the fish, Palaeoniscus capensis, have been recorded in the Whitehill Formation in the southern part of the basin (MacRae, 1999), which is correlated with the Vryheid Formation... The Vryheid Formation in this area has its provenance in the north (Tavener Smith, 1982). The Whitehill Formation source is in the south. There is also a southerly source to the lower Vryheid Formation (Hastie et al., 2019), but this regime does not extend north of Vryheid. The Vryheid Formation is generally believed to be marine (Hastie et al., 2019) but no significant fossils have been discovered. The lack of vertebrate fossils is problematic. In the marine case it may be due to the water being heavily silted but this is speculation*."

The Sheepmoor WEF is mostly non-fossiliferous Karoo Dolerite. The 1969 topographical map indicated that there forty-three (43) settlements, or homesteads, kraals and farm buildings. Most of these were farm labourers' settlements that could have graves.

The Battle of Onverwacht occurs on one of the hills of the proposed Sheepmoor WEF. Alan Smith Consulting (2023) summarises the Battle as the last battle of the 2nd Anglo Boer War. The battle was a short running battle and as such would be fluid with movements across the entire area. There would have been no time to dig trenches or make fortifications and thus no built structures were established as part of the battle. While the general area is a battlefield there are no real fixed positions during the battle, rather points on the landscape where certain incidents occurred.

There is a memorial in the approximate center of the general battlefield. This memorial was erected in 2002 by the people from Ermelo as part of a school project. The remains of the soldiers have been relocated to the Garden of Remembrance Ermelo Cemetery in 1962, while General Opperman was returned to his farm. There were three mass graves for the British, one for Maj. Vallentin, and one mass grave for the Boers.

The current landscape is heavily dominated by black wattle thickets, and this affects the general view of the area negatively. The area is on private land on not easily accessible without permission, and thus it has not been negatively affected by human visitors to a degree. The site is rarely visited.

5.13 VISUAL / LANDSCAPE

The Project site is approximately 30 km east of Ermelo and 37km west of Amsterdam in Mpumalanga. The study area was determined as the site provided by the Developer, and a 40 km buffer zone around it determined by the visual specialist as the maximum area of potential impact. The visibility of the turbines would be insignificant beyond this point.

The 40 km buffer zone has also been established for the study, as it may be possible, that when viewed from an elevated position or when the turbines are silhouetted on a ridgeline, the structures could be visible depending on light and atmospheric conditions. The other consideration is the effect of flashing red lights on top of the turbines at night, which would be visible from great distances against what is currently a relatively dark rural sky.

It is anticipated that the potential visual impact should not extend beyond 5km and for this reason the visual specialist has limited the study area to 5km either side of the centre line of the proposed corridors.

The study area consists of a landscape that varies from relatively flat with wide open grasslands and agricultural lands, to rolling with low ridges, valleys, ridges, escarpments, and flat-topped hills. In the east the landscape drops down to the edge of the Mpumalanga escarpment with steeper valleys and ridges. The study area comprises gently undulating land originally covered with Eastern Highland Grassveld with Wakkerstroom Montane Grassland on the eastern edge (Mucina and Rutherford 2006:460). Most of the area is not often ploughed due to the clay soils. However, the very nature of the original vegetation in this area is low growing and visually uniform which does not provide much visual screening. Although the grassland vegetation is not overly sensitive to the development it does not assist in reducing the visual expose of the turbines. The vegetation is typical of the Highveld ambience, and it is this together with the topography which provides the Highveld sense of place.

The area further to the east forms the edge of the upper reaches of the escarpment and is well forested with timber plantations which may assist in screening the visibility of the turbines (i.e., visual absorption capacity (VAC) is relatively high for the eastern sections of the study area.

The landscape in the west and southwestern parts of the study area are visually intruded by existing power lines, views of the Camden Power Station and settlements such as Sheepmoor, which do not have the aesthetic appeal of the north. Although the hills to the far south of the N2 exert a reasonably powerful sense of place.

The study area is well populated, especially in the central/south which was borne out by the site visit.

The study area’s visual quality (resource) can be categorised into five landscape character zones. The area north of the R65 exhibits a high visual quality due to the rural agricultural ambience. The area to the east is more diverse with a mixture of grasslands, hills and valleys and timber production. The area to the south of the R65 to the N2 is a mix of farming, grazing settlements roads, power lines and game farms. In the far south and

southwest are grassland covered rolling hills that reach elevations of over 1700m above sea level.

5.14 TRAFFIC AND TRANSPORTATION

The general location of the sites is made up of farmlands with rural unpaved Class 4 Provincial roads such as D532 and D1299 supporting movement between the various farms, as well as access to some of these land parcel.

The N2 National Road is a paved/tarred single carriageway (undivided road) with a single lane per direction. It serves as a major primary east-west link between the towns of Ermelo and Piet Retief, which are situated to the west and east of the proposed development, respectively.

The R65 is a paved/tarred single carriageway (undivided road) with a single lane per direction. This road is a primary east-west regional road connecting the towns of Amsterdam and Ermelo, which are situated to the east and west of the proposed development, respectively.

The proposed Sheepmoor WEF development site is in a rural area where the predominant activity includes livestock farming, crop farming and logging. These activities are expected to continue during the construction, operation, and eventual decommissioning of the site.

6. ALTERNATIVE ASSESSMENT

In accordance with the requirements of Appendix 1 of the 2014 EIA Regulations (as amended), an assessment report must contain consideration of all alternatives, which can include activity alternatives, site alternatives, location alternatives and the "No Development" alternative. At a minimum, this chapter must address:

- The consideration of the No Development alternative as a baseline scenario;
- A comparison of reasonable and feasible selected alternatives; and
- The provision of reasons for the elimination of an alternative.

Alternatives are required to be assessed in terms of social, biophysical, economic and technical factors.

When assessing alternatives, they should be "practical", "feasible", "relevant", "reasonable" and "viable", and I&APs should be given the opportunity to provide input into the process of formulating alternatives. In this instance, this chapter provides a brief overview of the alternatives that have been considered for the scoping phase of this development.

6.1 THE NO DEVELOPMENT SCENARIO OR "NO-GO OPTION"

This scenario assumes that the proposed development does not proceed. It is equivalent to the future baseline scenario in the absence of the proposed development. Relative to the proposed development, the implications of this scenario include:

- *The land-use remains agricultural, with no further benefits derived from the implementation of a complementary land use;*
- *There is no change to the current landscape or environmental baseline;*
- *No additional electricity will be generated on-site or supplied through means of renewable energy resources. This would have negative implications for the South African government in achieving its proposed renewable energy target, given the need for increased generation;*
- *There would be a lost opportunity for South Africa to generate renewable energy. This would represent a significant negative social cost;*
- *There is no opportunity for additional employment (permanent or temporary) in the local area where job creation is identified as a key priority; and*
- *The national and local economic benefits associated with the proposed project's REIPPPP commitments and broader benefits would not be realised.*

The purpose of the proposed development is to generate renewable electricity and export this to the national grid. Other socio-economic and environmental benefits will result from the proposed development such as:

- *Reduced air pollution emissions - burning fossil fuels generates CO_2 emissions which contributes to global warming. Emissions of sulphurous and nitrous oxides are produced which are hazardous to human health and impact on ecosystem stability.*
- *Water resource saving – conventional coal-fired power stations use large quantities of water during their cooling processes. WEFs require limited amounts of water during*

construction and a minimal amount of water during operation. As a water stressed country, South Africa needs to be conserving such resources wherever possible.

- *Improved energy security – renewables can be deployed in a decentralised way close to consumers, improving grid strength while reducing expensive transmission and distribution losses. Renewable energy projects contribute to a diverse energy portfolio.*
- *Exploit significant natural renewable energy resources – biomass, solar and wind resources remain largely unexploited.*
- *Sustainable energy solutions – the uptake of renewable energy technology addresses the country's energy needs, generation of electricity to meet growing demands in a manner which is sustainable for future generations.*
- *Employment creation and other local economic benefits associated with support for a new industry in the* South African economy.

The 'No Development' alternative would not assist the government in addressing climate change, energy security and economic development.

If the project were not implemented, then the site would stay as it currently is. Although the heritage impacts with implementation would be greater than the existing impacts, the loss of socio-economic benefits is more significant and suggests that the No-Go option is less desirable in heritage terms.

The No-Development option would represent a lost opportunity for South Africa to improve energy security and supplement is current energy needs with clean, renewable energy. Given South Africa's current energy security challenges and its position as one of the highest per capita producers of carbon emissions in the world, this would represent a significant negative social cost. The proposed WEF should be developed, and the mitigation and enhancement measures identified in the EIA should be implemented.

No other location (development areas) alternatives are being considered. Renewable Energy (RE) development in South Africa is highly desirable from a social, environmental and development point of view and a wind energy installation is more suitable for the site due to the high wind resource.

The 'no-go' alternative is the option of not undertaking the proposed WEF project. Hence, if the 'no-go' option is implemented, there would be no development. This alternative would result in no environmental impacts from the proposed project on the site or surrounding local area. It provides the baseline against which other alternatives are compared and will be considered throughout the report.

6.2 SITE SELECTION

The Applicant identified the Sheepmoor WEF after conducting a series of pre-feasibility assessments by considering aspects such as climatic conditions (wind speed databases, pre-dominant wind directions), grid connection scenarios, site geography and topography, avifauna nest survey to identify restrictive no go buffers, ecological features and site accessibility.

Feasibility studies undertaken by the Project Applicant indicated that the Sheepmoore WEF site is suitable to develop and operate a wind farm as it satisfies the following criteria:

- Feasibility of access for wind turbine delivery as the site is easily accessible from the national road;
- Viable wind resource;
- The surrounding area is not densely populated;
- The proposed site is largely previously transformed agricultural land and current land use is grazing;
- Willingness of landowner to host a wind farm on their property; and
- No environmental fatal flaws identified in the screening assessment.

The unique features of this site eliminates the possibility of alternatives with similar site conditions. Alternatives are restricted to on-site aspects such as turbine footprints and layouts, roads and related infrastructure options.

As the sites are in a similar location, particularly in terms of the major road network, the main differentiation between sites from a transportation perspective was in terms of local access and available infrastructure. The Substation site was evaluated, however grid connection and integration lines were not evaluated from a transportation perspective as the effects of these do not have significant impacts on the transportation related assessment criteria.

At this phase, it was concluded, based on available information, that the Sheepmore WEF site is suitable for the construction and operation of the WEF.

6.3 DESIGN EVOLUTION ALTERNATIVES

Following the selection of a suitable site, consideration is given to the design of the WEF. It is important that wind turbines are sited in the optimum position to maximise the wind energy yield whilst minimising environmental impacts as far as possible.

Information collated during the scoping phase will be used to inform the design of the WEF progressively. Best practice advises that the EIA should be an iterative process rather than a post design environmental appraisal. In this way, the findings of the technical environmental studies will be used to inform the design of a development.

This approach will be adopted with respect to this proposed development, and where potentially significant impacts are identified, efforts will be made to avoid these through evolving the design of the proposed development. This will be referred to as mitigation to be embedded in the layout and design, or ‘embedded mitigation’.

A preliminary layout was produced showing suggested locations of wind farm turbines on the site. This layout will be adjusted, based on the initial scoping assessment and specialists’ findings. This adjusted layout will be called the ‘preferred layout’ and will be assessed in further detail during the EIA Phase.

6.4 TECHNOLOGY ALTERNATIVES

Additional renewable energy technologies include hydro-electric power, photovoltaic solar or concentrated solar power. The site itself has no resource for hydro-electricity. Solar electricity generation would require a much greater infrastructure footprint to generate the equivalent energy of the proposed WEF.

Based on the site's physical characteristics and existing land uses, the renewable energy technology best suited to the site, considering the potential environmental impacts, is a WEF, however the specific design at the site should be informed by the EIA process.

Various wind turbine designs and layouts will be considered for the site to maximise the electricity generation capacity and efficiency, whilst considering environmental constraints.

One alternative for the placement of the laydown area and on-site substation were provided to specialists. The placement of either of these alternatives is acceptable from the specialist perspectives. According to the Bat specialist, the Laydown Area and the Alternative Laydown Area are both located within no-go areas and must be relocated.

As the sites are in a similar location, particularly in terms of the major road network, the main differentiation between sites from a transportation perspective was in terms of local access and available infrastructure. The Substation site was evaluated; however, grid connection and integration lines were not evaluated from a transportation perspective as the effects of these do not have significant impacts on the transportation related assessment criteria.

7. DESCRIPTION OF THE PREFERRED ALTERNATIVE

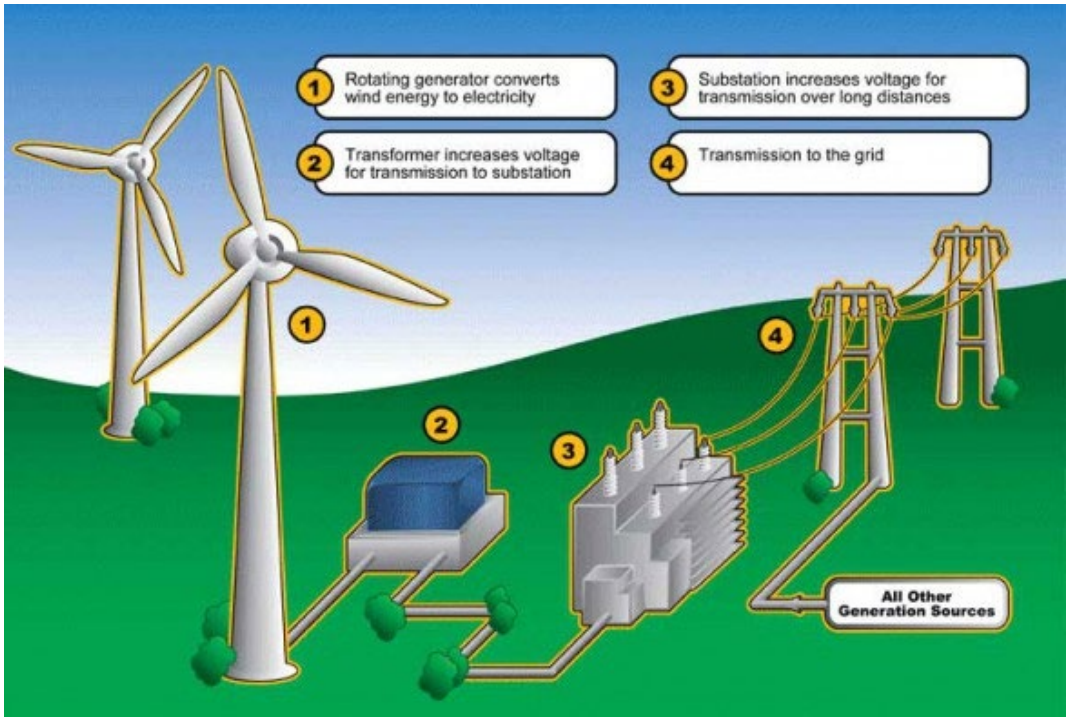
The proposed development will consist of:

- Up to 45 wind turbines, with a maximum hub height of up to 150 m and a rotor diameter of up to 220 m;
- Temporary laydown areas which will accommodate the crane platforms and hardstand laydown area;
- BESS;
- Cabling between the turbines, to be laid underground where practical and feasible;
- One on-site substation with capacity of up to 132 kV to facilitate the connection between the WEF and the electricity grid;
- 132 kV over-head powerline of approximately 22.3 km (300 m corridor);
- Internal roads (existing roads will be upgraded wherever possible);
- A temporary site camp establishment and concrete batching;
- Operation and Maintenance (O&M) buildings; and
- Total permanent development footprint of up to 180 ha after rehabilitation.

7.1 WIND ENERGY FACILITY COMPONENTS

The WEF will comprise components described below. It should be noted that as the design of the proposed development is not yet finalised, all dimensions are maximums, as is required by the EIA process. The final design may include infrastructure which is of equal or less than dimensions to those stated below, but not more than.

FIGURE 7-1 SIMPLE ILLUSTRATION OF A TYPICAL WIND ENERGY FACILITY OPERATING SEQUENCE



7.1.1 WIND TURBINE GENERATORS AND HARDSTAND AREAS

The proposed WEF will comprise of up to 45 turbines.

At this stage, it is envisaged that the turbines will each have a capacity to generate up to 8 MW of power. The turbines will be three-bladed horizontal-axis design with a hub height of up to 150 m, a rotor diameter of up to 220 m and a blade length of up to 110 m. The exact turbine model has not yet been selected and will be identified based on the wind resource distribution, technical, commercial and site-specific considerations.

The turbine rotor speed will vary according to the energy available in the wind, the wind speed. The turbines will generate power in wind speeds between approximately 3 metres per second (m/s) and 28 m/s (depending on the model of turbine) with maximum power output usually achieved at wind speeds of around 10 - 12 m/s. On average, wind speeds greater than approximately 25 m/s the turbines will automatically turn the angle of the blade to reduce energy capture (this is known as 'feathering') and stop turning to prevent damage.

Each turbine will require a transformer that will be located at the base of the turbine.

Each turbine will have a circular foundation with a diameter of up to 32 m and this will be placed alongside a crane hardstand of approximately 35 m x 25 m. The permanent footprint for turbine hardstands will be approximately 1 Ha per turbine.

FIGURE 7-2 AN ILLUSTRATION OF TYPICAL COMPONENTS OF A WIND TURBINE GENERATOR (WTG)

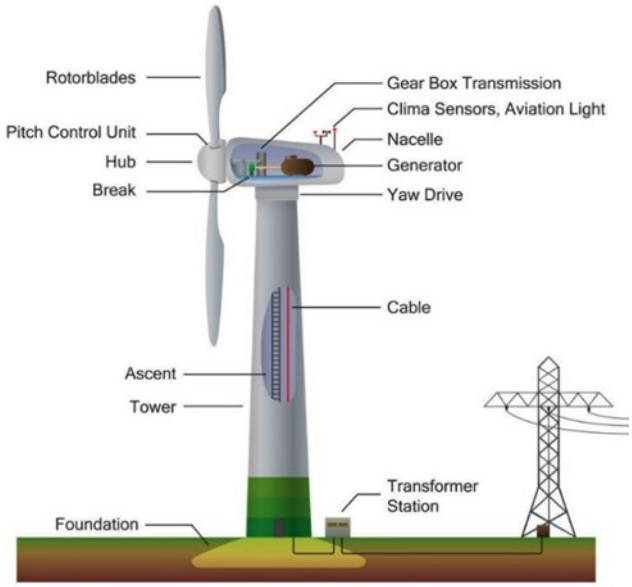


FIGURE 7-3 THE INSIDE OPERATION OF A TYPICAL WIND TURBINE

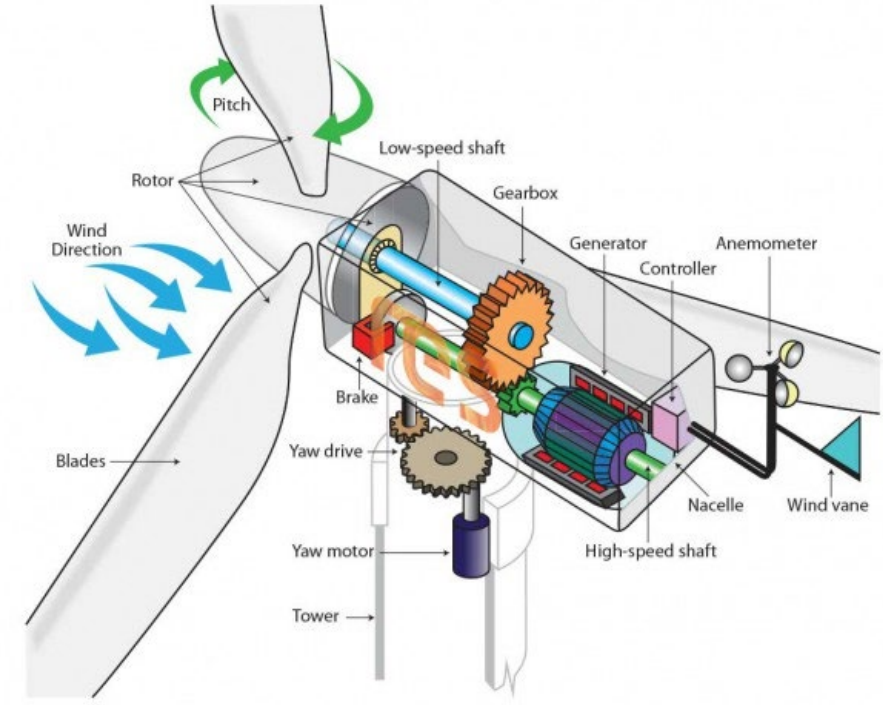


FIGURE 7 4 ILLUSTRATION OF A TYPICAL TURBINE HARDSTAND AND LAYDOWN AREA

7.1.2 ELECTRICAL CABLING AND ON-SITE SUBSTATION

Medium-voltage (MV) power lines internal to the WEF will be entrenched and located adjacent to the access roads and /or within the footprint of the internal roads to an onsite Facility Substation. The 132 kV high-voltage (HV) powerline that transmits power from the proposed Sheepmoor WEF Substation to the Eskom Switching Station on site will be strung overhead, supported either on monopole or lattice tower structures.

7.1.3 BATTERY ENERGY STORAGE SYSTEM

The function of the BESS will be to store peak kinetic energy produced by the Sheepmoor WEF for use in the following ways:

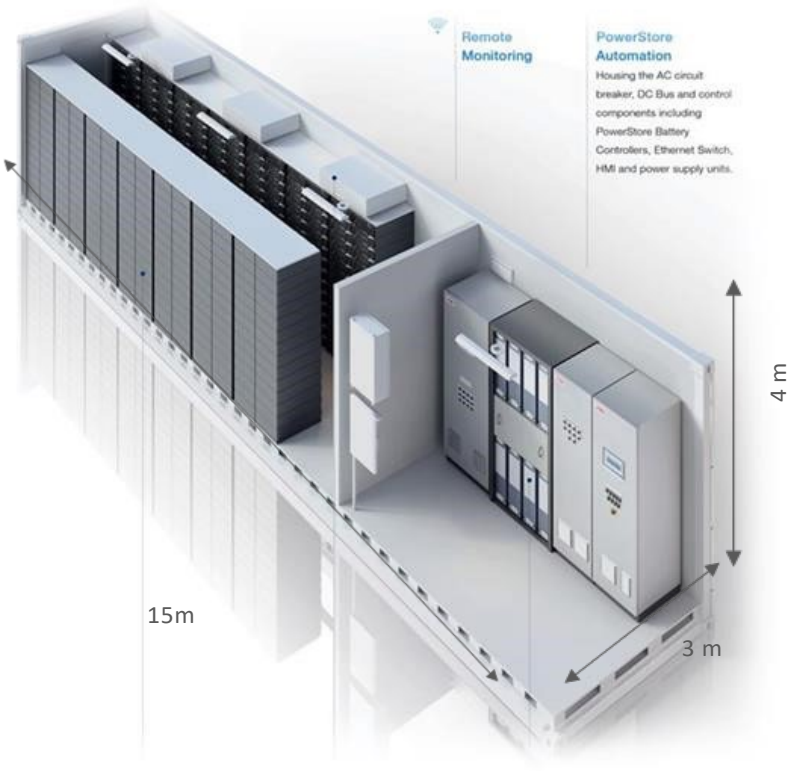
- To power the operation of the proposed development when the national grid is strained by high (or peak) demand, often resulting in load-shedding.
- To provide excess generation to the national grid, which will assist with stabilizing electricity supply during peaks and troughs of demand.
- To reduce the impact caused by the variability and limited predictability of wind generation.

The preferred battery technology being considered would be Solid-State, Lithium Ion (Li-Ion) batteries, which consists of multiple battery cells that are assembled together to form module. Each cell contains a positive electrode, a negative electrode and an electrolyte. A module may consist of thousands of cells working in conjunction. Modules are normally packaged inside containers (similar to shipping containers) and these containers are delivered pre-assembled to the project site.

The containers will have approximate dimension ranges of: height 2 m - 5 m, width 1.5 m - 3 m, length 7 m - 20 m. The containers are raised slightly off the ground and are bunded to prevent possible environmental damage resulting from any equipment malfunction. The proposed development is considering the option of stacking these containers vertically to a maximum of two container layers or a height of 8 m.

The BESS storage capacity will be up to 1000 (MWh) with up to four hours of storage and will be placed on a concrete footprint of up to 4 ha. The BESS will be in close proximity to the on-site substation, will be fenced off and will be linked to the substation via internal cables and will not have any additional office / operation / maintenance infrastructure as those of the substation.

FIGURE 7-4 TYPICAL REPRESENTATION OF HOW BATTERIES AND BATTERY MODULES ARE HOUSED AND ASSEMBLED.



This proposed development will have similar project components and will be designed in a similar manner.

FIGURE 7-5 SOLARCITY'S TESLA BATTERY STORAGE FACILITY, HAWAII

FIGURE 7-6 A STOCK IMAGE OF A SIMILAR DEVELOPMENT WITH AN ON-SITE SUBSTATION AND BESS.

7.1.4 LAYDOWN AREAS AND SITE OFFICES

Individual turbine temporary laydown areas including crane boom laydown areas, blade laydown areas and other potential temporary areas will be up to a maximum 24 ha. A total footprint (permanent and temporary) of up to 204 ha.

The construction laydown area will be located within the permanent footprint area of up to 180 ha.

7.1.5 INTERNAL SITE ACCESS ROADS

The majority of the access road will follow existing, gravel farm roads that may require widening up to 15 m (inclusive of storm water infrastructure). Where new sections of road need to be constructed (/lengthened), this will be gravel/hard surfaced access road and only tarred if necessary.

A network of gravel internal access roads and a perimeter road (cumulatively up to 33 km in length), each with a width of up to ~ 12 m, will be constructed to provide access to the various components of the WEF.

Site access is proposed directly off an unnamed gravel road surrounding the site; however, this will be confirmed based on the outcome of the traffic impact assessment.

7.2 GRID COMPONENTS

The proposed grid connection to serve the Sheepmoor Wind Energy Facility (Pty) Ltd will include the following components:

- An on-site substation with a capacity of up to 132kV, occupying an area of up to approximately 1ha. The proposed substation will be a step-up substation and will include an Eskom portion and an IPP portion, hence the substation has been included in the EIA for the WEF and for the grid infrastructure to allow for handover to Eskom. The applicant will remain in control of the low voltage components (i.e. 33kV components) of the substation, while the high voltage components (i.e. 132kV components) of this substation will likely be ceded to Eskom shortly after the completion of construction; and
- A 132kV overhead power line connecting the on-site substation thereby feeding the electricity into the national grid. The approximate distance of the OHPL will be 22.3 km traversing sixteen (16) land parcels, be constructed to connect to the Eskom Uitkoms Substation.

7.3 SERVICE PROVISION

7.3.1 HEALTH AND SAFETY

The IFC guidelines for Health and Safety are based on the Occupational Health and Safety Act (OHSA) of America and are subsequently aligned with South African legislation (OHS Act no 85 of 1993). It is understood that the project infrastructure and equipment will be designed to good industry standards to minimise risks personnel working at the proposed development site.

Sheepmoor Wind Energy Facility (Pty) Ltd will institute a Health and Safety (H&S) Plan prior to construction, for all persons working at the proposed development site. The plan will need to evaluate the risks and impacts to the health and safety of the affected community during the design, construction and operation of the proposed development, and establish preventive measures to address them in a manner commensurate with the

identified risks and impacts within this assessment. Such measures need to adhere to the precautionary principle for the prevention or avoidance of risks and impacts over minimization and reduction.

7.3.2 WATER REQUIREMENTS

Water will be sourced from either the Local Municipality, supplied from a contractor and trucked in, from existing boreholes located within the application site or from a new borehole if none of these options are available. Note, however, that should municipal water supply not be confirmed, the Applicant will investigate other water sources considering any necessary and relevant legal requirements.

High water use is only anticipated during the first six months of the construction phase mainly for purposes of the turbine foundations, roads and dust suppression. Thereafter the water usage will decrease drastically. The anticipated water usage for the proposed development for the duration of the construction phase includes the following:

- Drinking;
- Ablution facilities;
- Access Road construction;
- Dust suppression;
- Fire-fighting reserve;
- Cleaning of facilities; and
- Construction of foundations for the WEF infrastructure, i.e., turbines and substation, etc.

The water use requirement during the operational phase will be primarily for human consumption and sanitation purposes.

7.3.3 STORMWATER MANAGEMENT

Stormwater drainage systems will be constructed and kept separate from the sewerage effluent system on site to ensure that stormwater run-off from site is appropriately managed. Water from these systems is not likely to contain any chemicals or hazardous substances and will be released into the surrounding environment based on the natural drainage contours.

Wastewater and sludge will be managed by local authorities and service providers. All wastewater will be handled in accordance with the *Guidelines for the Utilisation and Disposal of Wastewater Sludge Volumes 1 to 6 (Herselmann & Snyman, 2006)*.

7.3.4 WASTE

During the construction phase, it is estimated that the WEF would generate solid waste, which includes (but is not limited to) packaging material, building rubble, discarded bricks, wood, concrete, plant debris and domestic waste. Solid waste will be collected and temporarily stockpiled within designated areas on site during construction, and thereafter removed and disposed of at a nearby registered waste disposal facility on a regular basis

as per agreement with the local municipality. Where possible, recycling and re-use of materials will be encouraged.

During the operational phase, the WEF will typically produce minor quantities of general non-hazardous waste mainly resulting from the O&M and office areas. General waste will be collected and temporarily stockpiled in skips in a designated area on site and thereafter removed and disposed of at a nearby registered waste disposal facility (or registered landfill) on a regular basis as per agreement with the local municipality. Where possible, recycling and re-use of materials will be encouraged.

Any hazardous waste such as chemicals or contaminated soil as a result of spillages, which may be generated during the construction and operational phases, will be temporarily stockpiled within a designated area on site and thereafter removed off site by a suitable service provider for safe disposal at a registered hazardous waste disposal facility.

The Project will adopt the 4R principle for solid waste management, which includes (in order or priority) to:

- Refuse single use plastics as much as possible;
- Reduce the use of non-recyclable products;
- Reuse solid wastes where possible to convert it into other useful products; and
- Recycle all wastes where possible.

7.3.5 SEWAGE

The Wind Energy Facility will require sewage services during the construction and operational phases. Low volumes of sewage or liquid effluent are estimated during both phases. Liquid effluent will be limited to the ablution facilities during the construction and operational phases. Portable sanitation facilities (i.e., Chemical toilets) will be used during the construction phase, which will be regularly serviced and emptied by a registered contractor on a regular basis.

The Applicant may consider a conservancy tank system which will be employed on site during the operational phase for which a registered company will be contracted to store and transport sewage from site to an appropriate municipal wastewater treatment facility.

7.3.6 ELECTRICITY

Electricity on site will be from on-site diesel generators, as well as sourced from the national grid distribution networks.

7.4 SUMMARY OF PROJECT INFORMATION

Project Component	Detail
DFFE Reference	To be confirmed
Site Access	Locality to be confirmed.

		Total width up to 15 m (12 m after rehabilitation) consisting of up to 3 m width for underground 33 kV reticulation.
WEF Maximum Generation Capacity		Up to 360 MW
Number of Turbines		Up to 45
Hub Height from ground level		Up to 120 m
Blade Length		Up to 110 m
Rotor Diameter		Up to 220 m
Length of internal roads		Unknown at this point.
Width of internal roads		Up to 12 m to be rehabilitated to up to 9 m.
On-site substation capacity		Up to 132 kV
Proximity to grid connection		Approximately 22.3 km
Grid Connection Capacity		Up to 132 kV
Area occupied by both permanent and construction laydown areas	Temporary turbine construction laydown and storage areas.	Crane platforms and hardstand laydown area up to 45Ha
	Construction laydown/staging area which will also accommodate the O&M buildings	Will be located within the permanent footprint area.
	Permanent footprint area dimensions, including roads, turbine hardstand areas, O&M buildings and battery pad.	O&M: Up to 1 ha Hardstand areas: Up to 1 ha Total area of final footprint (including roads): up to 180 ha
Operations and maintenance buildings (O&M building) with parking area		Up to 1 ha
Height of fencing		2.8 m
Type of fencing		Where site offices are required, temporary screen fencing used to screen offices from the wider landscape.

7.5 EMPLOYMENT

In addition to the workforce required during the construction phase (which is anticipated to be up to 350 staff at the peak of construction), the Project is anticipated to require an additional 14 staff during the operational phase of the Project.

8. NEED AND DESIRABILITY

The EIA Regulations, 2014, as amended state that the objective of the scoping process includes to, through a consultative process, motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location.

8.1 THE NEED & DESIRABILITY OF RENEWABLE ENERGY FACILITIES

WEFs can play a role in mitigating or reducing climate change, addressing South Africa's energy resource constraints and producing low-cost energy. In addition, operating WEFs in South Africa contribute significantly to the economic development of the areas in which they are located through the requirements of the REIPPPP adjudication process. This section of the report highlights the national, provincial and local plans and policies that are in support of renewable energy facilities. Throughout this section, it is demonstrated that at all levels of governance, policy supports the development of renewable energy to address energy supply issues, and to promote economic growth in South Africa.

8.1.1 MITIGATING CLIMATE CHANGE

The scientific consensus is that the climate is changing and that these changes are in large part caused by human activities[8]. Of these human activities, increase in carbon dioxide (CO_2) levels due to emissions from fossil fuel combustion is regarded as a significant contributor to anthropogenic climate change.

As explained in National Treasury's Carbon Tax Policy Paper (May 2013)[9], addressing the challenges of climate change through facilitating a viable and fair transition to a low-carbon economy is essential to ensure an environmentally sustainable economic development and growth path for South Africa. Further the Policy Paper states that the South African government is of the view that South Africa needs to reduce its greenhouse gas emissions while working to ensure economic growth, increase employment, and reduce poverty and inequality[10].

Renewable energy projects will play a significant role in meeting the targets of the Paris Agreement and assisting the transition to a low-carbon economy.

8.1.2 DIVERSIFICATION AND DECENTRALISATION OF SUPPLY

With its abundant coal supplies, approximately 89% of South Africa's energy needs are currently met through coal-fired generators, with nuclear energy contributing approximately 5% and the balance by pumped storage and hydroelectric (3.6%), renewable energy (2.4%) and gas turbines (0.1%). Electricity generation is dominated by state-owned power company Eskom, which currently produces over 96.7% of the power used in the country.

[8] http://adsabs.harvard.edu/abs/2013ERL.....8b4024C.
[9] National Treasury Carbon Tax Policy Paper. Available online http://www.treasury.gov.za/public%20comments/Carbon%20Tax%20Policy%20Paper%202013.pdf
[10] http://www.treasury.gov.za/public%20comments/Carbon%20Tax%20Policy%20Paper%202013.pdf

A diversification of energy supplies and producers, particularly with respect to renewable energy sources, would lead to greater energy security and economic and environmental benefits.

The deployment of various renewable technologies increases the diversity of electricity sources and, through local decentralised generation, contributes to the flexibility of the system and its resistance to central shocks.

According to the International Energy Agency, "renewable energy resources ... exist virtually everywhere, in contrast to other energy sources, which are concentrated in a limited number of countries. Reduced energy intensity, as well as geographical and technological diversification of energy sources, would result in far-reaching energy security and economic benefits."[11]

The renewables programme has resulted in over 6,000 MW of generation capacity being allocated to bidders across a variety of technologies, principally in wind and solar in South Africa. Progress in this regard has been made under the DoE REIPPPP. According to the DoE's Integrated Resource Plan for Electricity 2010-2030, South Africa is aiming to procure 9,200 MW of wind power by 2030.

8.1.3 ECONOMIC DEVELOPMENT AND JOB CREATION

The REIPPPP requires Economic Development ("ED") commitments from onshore wind energy projects and projects are adjudicated according to their ED commitments. The main ED beneficiaries of approved projects are currently communities living within a 50 km radius of renewable energy facilities. Projects are bid and thereafter adjudicated according to tariff (70 %) and Economic Development (30 %). There is therefore an incentive for projects to focus on Economic Development of the Local Community and to assign as much revenue, jobs, procurement etc. to local people, as well as South African companies and people as possible to stand a chance of having a successful project.

TABLE 8.1: REIPPPP WEIGHTING

Economic Development Elements	Weighting
Job Creation	25%
Local Content	25%
Ownership	15%
Management Control	5%
Preferential Procurement	10%
Enterprise Development	5%
Socio-Economic Development	15%
Total	100%
Total points	30 points

[11] www.iea.org/textbase/npsum/ETP2012SUM.pdf

A number of these elements will have a significant and positive impact on the Local Community.

In terms of job creation, bidders are required to indicate the actual number of jobs that will be created for South African citizens, Skilled People, Black People, Skilled Black People and Citizens from the Local Communities. Significant skilled and unskilled job opportunities will be created in the Local Communities, particularly during the construction period.

For Ownership, bidders are required to indicate the total shareholding of the Project Company in the hands of Black People and Local Communities. The minimum ownership percentage for Local Community is 2.5% but projects have committed up to 40% Local Community Ownership in order to have a competitive project. Broad-based community trusts are established as a vehicle for Local Community Ownership to received dividend revenue from an operating project that will be invested in socio-economic development imperatives as determined by trustees. The ownership stake is funded either through debt or through equity partners ("a free-carry").

The Socio-Economic Development and Enterprise Development commitments require a percentage of gross revenue from the operating wind farm to be invested in education, health, small business development etc. Projects are required to commit at least 1% of gross revenue towards socio-economic development. As an indication, 1 % of gross revenue of a hypothetical 140 MW wind farm, with a capacity factor of 35% and a tariff of 80 c/kWh would equal approximately R3.5 m/year (and R68 million over the 20-year operation period of a project). Projects in the REIPPPP receive additional points if the socio-economic and enterprise development investments are committed to be invested in the Local Community.

WEFs in South Africa will create skilled and unskilled jobs, particularly during the construction period. Under the REIPPPP, projects are incentivised to maximise the direct job creation opportunities, particularly for people in the communities surrounding the project.

WEFs tend to be constructed in rural areas with small communities and limited infrastructure and social amenities. A wind farm would create indirect jobs in accommodation, catering and other services that would support a wind farm and cater for the material and social needs of wind farm workers.

Localisation is considered one of the major contributors to job creation and general improvement of the economy of South Africa. Localisation through the construction of new manufacturing facilities to build wind turbine towers and other turbine components in South Africa is currently progressing.

Wind energy can provide technical skills to South Africans and thus improve the technical skills profile of the country and the regions where wind energy facilities are located. Through the REIPPPP, developers' own initiatives and through support from international donor agencies, a number of young South Africans are being trained on various aspects of wind farm construction and operation.

These projects, if successfully implemented, have the potential to transform for the better key development areas of South Africa and would assist South Africa in meeting its development goals, while meeting its carbon emission reduction targets as per international protocols.

8.1.4 JUST ENERGY TRANSITION

According to the International Institute for Sustainable Development (IISD) in their 2018 report on "Strategies for Just Energy Transitions," energy transitions entail changes in how energy is generated and utilized, employing various technologies and resources. A low-carbon energy transition specifically denotes a move away from high-carbon energy sources like oil, gas, and coal towards low-carbon and zero-carbon alternatives such as renewables.

A just energy transition is a collaborative vision and process centered on dialogue, underpinned by a set of guiding principles, aimed at transforming energy production and consumption practices. Its goal is to mitigate adverse effects on workers and communities reliant on high-carbon industries slated for decline, while maximizing opportunities for new, sustainable employment in low-carbon sectors. The objective is to ensure an equitable distribution of both the costs and benefits associated with the transition.

Taking action sooner rather than later can render energy transitions more cost-effective and fair, presenting fresh avenues for nations to develop low-carbon sectors. However, breaking free from "carbon lock-in" poses significant challenges, necessitating focused political and media initiatives to expedite just energy transitions. Many nations have already initiated or are in the initial phases of these processes, and based on case studies and research, the following table outlines specific measures governments can adopt to commence or expedite a just energy transition (IISD, 2018).

According to JET IS (2022), the coal plant decommissioning will need R4,1 billion between 2023 and 2027. Coal plant-decommissioning costs reflect what Eskom has currently provided for in its planning. These costs exclude the costs of repurposing or repowering retired plants and other infrastructure investments.

As per the JET IS (2022), the infrastructure investment priorities are:

- To manage the decommissioning of the retiring coal generation fleet, in line with a revised Integrated Resource Plan (IRP), and in tandem with the development of renewable energy generation at scale and pace;
- To timeously strengthen the transmission grid infrastructure to accommodate the shift to renewable energy; and
- To modernise the electricity distribution system.

8.2 STRATEGIC INTEGRATED PROJECT (SIP) 20C: EMBEDDED GENERATION NATIONAL PROGRAM (EGNP) -CONFIRMATION OF PROJECT STATUS

The Embedded Generation National Program (EGNP) forms part of the Energy Strategic Integrated Programs No. 20c, that were gazetted on 06 December 2022 (Government

Gazette 437658) in line with the provisions of the Infrastructure Development Act (IDA) (Act No.23 of 2014). This project has been awarded SIP Status.

8.3 POLICIES IN SUPPORT OF RENEWABLE ENERGY

Renewable energy is supported in terms of meeting the country's climate change goals, and in terms of reducing the country's dependence on fossil fuels as the main source of meeting the country's electricity requirements. The National Climate Change Adaptation Strategy[12] (NCCAS) for The Republic of South Africa Version UE10, 13 November 2019, explains that the South African primary sectors, such as agriculture and mining, which are natural resource dependent are high consumption uses of energy. The NCCAS is adopting a cluster approach to assist with the changing climate conditions and the affect it has on various sectors. An action in support of this development is the approach to "create a more adaptive energy system to reduce dependence on a centralised system and increase distributed generation, especially in rural areas". "This will involve encouraging the development of an adaptive and decentralised energy system so that the system is more resilient to climate disruptions".

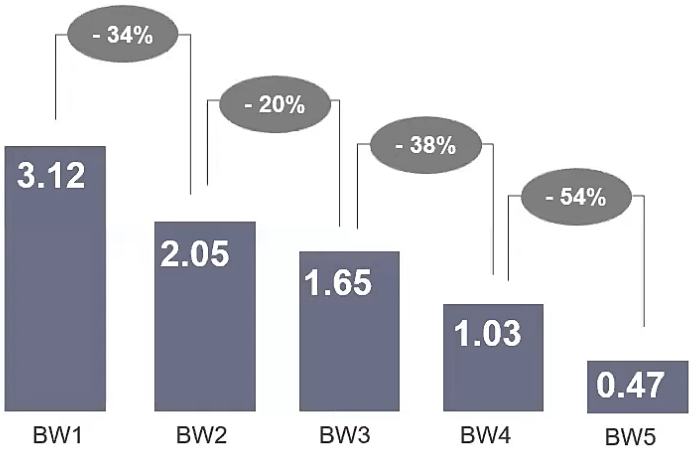
Both national and provincial policies and planning documents support the development of renewable energy facilities. The development of and investment in renewable energy is supported by the National Development Plan (NDP), New Growth Path Framework, Integrated Resource Plan (IRP) and National Infrastructure Plan. At a provincial level, the development of renewable energy is supported by the Mpumalanga Provincial Spatial Development Framework (PSDF) of 2019 and Msukaligwa Municipality Integrated Development Plan (IDP).

The need and desirability for renewable energy developments play a role in South Africa meeting its energy and climate change targets and provides a socio-economic boost at the local level in areas that are in need of it.

Aside from environmental considerations, investment in renewables have been driven by dramatic reductions in their costs. Plate 5.1 shows this trend and that in the six years between bid windows 4 and 5, the average price of electricity purchased through the REIPPPP fell by 54% (Magoro, 2021).

12 https://www.environment.gov.za/sites/default/files/docs/nationalclimatechange_adaptationstrategy_ue10november2019.pdf

FIGURE 8-1 REIPPP AVERAGE BID PRICES IN APRIL 2021 TERMS (MAGARO, 2021)



8.4 NEED & DESIRABILITY GUIDELINE

Reference is made to the DFFE 2017 Guideline on Need and Desirability[13] which states that while the "*concept of need and desirability relates to the type of development being proposed, essentially, the n and desirability can be explained in terms of the general meaning of its two components in which need refers to time and desirability to place – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can be equated to wise use of land – i.e. the question of what is the most sustainable use of land*."

The guidelines pose questions that should be considered in this investigation, which will be addressed in EIA Phase.

[13]DEA (2017) Guideline on Need and Desirability. Department of Environmental Affairs (DEA), Pretoria, South Africa, ISBN: 978-0-9802694-4-4.

9. PUBLIC PARTICIPATION PROCESS

The Public Participation Process (PPP) follows the requirements of Section 24 (5) and Chapter 6 (41, 42, 43, and 44) of GN R. 326 of NEMA EIA Regulations, 2014 (as amended), as well as the Public Participation Guidelines in terms of NEMA, 1998 EIA Regulations, 2014.

A PPP is an important part of the S&EIA process. The aim of PPP is:

- To inform I&APs of the proposed project;
- To identify and respond to issues, comments and concerns as raised by I&APs;
- To promote transparency of the project and its potential consequences and ensure I&APs understanding of the project and associate activities;
- To facilitate open dialogue and liaise with all I&APs;
- To assist in identifying potential environmental (biophysical and socio-economic) impacts associated with the proposed project; and
- To ensure that all I&AP issues and comments are accurately recorded, addressed and documented in a Comments & Response Report (CRR).

9.1 PRE-SCOPING PHASE PUBLIC PARTICIPATION PROCESS

The initial notification phase gives opportunity to the public to register as an I&AP and receive all correspondence and notification regarding the application process. During this phase the following was conducted:

- Site notices were erected on the site boundary in July 2023;
- Notices were erected in the towns of Ermelo, Amsterdam and Sheepmoor in July 2023;
- Advertisements were placed in the Highveld Newspaper and the Mpumalanga News Newspaper in July 2023; and
- Initial notification e-mails were distributed on to all pre-identified I&APs, including the affected landowner and occupiers of the site, municipal councillor (s), ratepayers in the area, affected district and local municipalities, and organs of state. I&APs who responded to the newspaper and notices were also sent an initial notification email.

9.2 SCOPING PHASE PPP

The following PPP activities will be undertaken as part of the Scoping Phase engagement:

- Notifications will be sent to registered I&APs, key stakeholders, and organs of state to inform them of the availability of the DSR for their review and comment for a period of 30 days;
- A CRR will be compiled, recording comments and/or queries received and recording the responses provided; and
- Notification regarding the submission of the Final Scoping Report (FSR) for DFFE approval, which will include a CRR, will be sent to registered I&APs, key stakeholders, and organs of state.

9.3 EIA PHASE PPP

The following PPP activities will be undertaken as part of the EIA Phase engagement:

- Notifications will be sent to registered I&APs, key stakeholders, and organs of state to inform them of the availability of the Draft EIA Report for their review and comment for a period of 30 days;
- The CRR will be updated, recording comments and/or queries received and recording the responses provided; and
- Notification regarding the submission of the Final EIA for DFFE approval, which will include the CRR, will be sent to registered I&APs, key stakeholders, and organs of state.

9.4 EA DECISION PHASE

Notifications will be sent to all registered I&APs, key stakeholders, and organs of state to inform them of the decision by the DFFE and the appeal procedure.

Proof of the PPP undertaken to date will be included in the Final EIA Report.

10. SCOPING PHASE ASSESSMENTS OF POTENTIAL IMPACT

This section provides the preliminary scoping phase potential impact assessment of the proposed development.

10.1 SOIL AND AGRICULTURAL POTENTIAL

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

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

In the case of wind farms, the first factor, size of footprint, is so small that the total extent of the loss of future agricultural production potential is insignificantly small, regardless of how much production potential the land has, and regardless of the duration of the impact. This is because the required spacing between turbines means that the amount of land excluded from agricultural use is extremely small in relation to the surface area over which a wind farm is distributed.

Wind farm infrastructure (including all associated infrastructure and roads) typically occupies less than 2% of the surface area, according to the typical surface area requirements of wind farms in South Africa (DEA, 2015). Most WEFs occupy less than 1% of the surface area. All agricultural activities can continue unaffectedly on all parts of the farmland other than this small footprint, from which agriculture is excluded, and the actual loss of production potential is therefore insignificant.

A study done to measure the impact of existing WEFs on agricultural production potential (Lanz, 2018) is highly informative of the extent of the agricultural impact that is likely for this proposed development. Although the study was done in a different agricultural environment, it is similar in terms of being a highly productive and intensively farmed environment with cultivation. There is no reason that the results obtained in that study would not be applicable to the area in this assessment. The overall conclusion of the study was that, although wind farms have been established within an area of cultivated farmland that supports intensive and productive farming, it is highly unlikely that this has caused a reduction in agricultural production. Small amounts of production land have been lost, but the consequence of this for agricultural production has been negligible. It is likely that the positive financial impacts of wind farming have outweighed the negative impacts, and that wind farming has benefited agriculture and agricultural production in the area.

As identified in the study, it is important to note that wind farms have both positive and negative effects on the production potential of land. It is the net sum of these positive and

negative effects that determines the extent of the change in future production potential. The positive effects are:

- **Increased financial security for farming operations -** reliable and predictable income will be generated by the farming enterprises through the lease of land to the energy facility. This will increase financial security and could improve farming operations and productivity through increased investment into farming.
- **Improved security against stock theft and other crime** due to the presence of security infrastructure and security personnel at the energy facility.
- **An improved road network**, with associated stormwater handling system. The WEF will construct turbine access roads of a higher standard than the existing farm roads, which will give farming vehicles better access to farmlands. This will be especially relevant during wet periods when access to croplands for spraying etc is limited by the current farm roads.

There are two additional effects, but because they are highly unlikely to influence agricultural production, they are not considered further. They are:

- **Prevention of crop spraying by aircraft over land occupied by turbines** – ground based or using drones for spraying are effective, alternative methods that can be used without implications for production or profitability.
- **Interference with farming operations** - construction (and decommissioning) activities are likely to have some nuisance impact for farming operations but are highly unlikely to have an impact on agricultural production.

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

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

10.1.1 CUMULATIVE PHASE

The most important concept related to a cumulative impact is that of an acceptable level of change to an environment. As mentioned, this cumulative impact assessment will determine the quantitative loss of agricultural land if all renewable energy project applications within a 30 km radius become operational. The quantification of the cumulative impact will be done in detail in the EIA phase. This is highly likely to confirm that the cumulative impact of loss of future agricultural production potential is low. The development is highly likely to have an acceptable impact on the agricultural production

capability of the area and therefore be recommended for approval from a cumulative agricultural impact point of view.

Due to its negligible agricultural impact, the assessed power line cannot exceed acceptable levels of change in terms of agricultural land loss, no matter how much grid infrastructure exists. The cumulative impact of the power line can confidently be assessed as being of very low significance and therefore as acceptable. It will not have an unacceptable negative impact on the agricultural production capability of the area, and it is therefore recommended, from a cumulative agricultural impact perspective, that the development be approved.

10.2 NOISE

Increased noise levels are directly linked with the various activities associated with the construction of the proposed development, as well as the operation phase of the WEF. In South Africa the document that addresses the issues concerning environmental noise is SANS 10103. It provides the maximum average ambient noise levels, LReq,d and LReq,n, during the day and night respectively to which different types of developments may be exposed. For rural areas the Zone Sound Levels (Rating Levels) are:

- Day (06:00 to 22:00) - $L_{Req,d}$ = 45 dBA, and
- Night (22:00 to 06:00) - $L_{Req,n}$ = 35 dBA.

10.2.1 CONSTRUCTION PHASE

There are a number of factors that determine the audibility as well as the potential of a noise impact on receptors. Maximum noises generated can be audible over a large distance, however, maximum noises are generally of very short duration. If maximum noise levels however exceed 65 dBA at a receptor, or if it is clearly audible with a significant number of instances where the noise level exceeds the prevailing ambient sound level with more than 15 dB, the noise can increase annoyance levels and may ultimately result in noise complaints. Average or equivalent sound levels are another factor that impacts on the ambient sound levels and is the constant sound level that the receptor can experience.

A potential significant source of noise during the construction phase has increases in noise levels at closest receptors. Increased noises or disturbing noises may increase annoyance levels with project. Noise levels could exceed 45 dBA during construction. (temporary construction of access roads, construction of WTG as well as construction traffic passing close to NSR). Multiple construction activities taking place simultaneously may impact an area up to 2,000m from the activities at night.

As a preliminary guideline, construction activities within 160m from an identified and verified NSR is not recommended considering daytime noise limits (considering only construction noises). This buffer would be more considering night-time noise rating levels.

Without noise propagation modeling where cumulative effects are included, it is difficult to assess the potential significance of the noise impact. Using the precautious approach, it is Possible to Highly Probable that a noise impact will occur (depending on location of NSR),

with the consequence likely Negligible to Moderately Severe (depending on location of NSR in relation to noise generating activities).

10.2.2 OPERATIONAL PHASE

The proposed development would be designed to have an operational life of up to 25 years with the possibility to further expand the lifetime of the WEF. The only development related activities on-site will be routine servicing (access roads and light traffic) and unscheduled maintenance.

However, projected operational noise impacts will only be modelled during the future EIA phase. However, considering the presence of NSRs, as well as noise levels associated with operating WTGs, noises could change existing ambient sound levels, will be audible and could annoy NSR.

Increases in noise levels at closest receptors, though WTG will only operate during periods with increased wind speeds. Considering international guidelines, a noise limit of 45 dBA is recommended. The extent of the impact relates to multiple WTG operating at night could impact on an area up to 2,500m from the WTG.

Depending on the layout and the sound power emission levels (SPL) of WTG available on the market, noise levels may be higher than 45 dBA for a worst-case scenario (using the SPL of 112.6 dBA). Without noise propagation modelling where cumulative effects are included, it is difficult to assess the potential significance of the noise impact. Using a precautionary approach, it is Probable to Highly Probable that a noise impact will occur. The potential significance of the noise impact will be assessed in more detail in EIA phase using a more detailed noise model.

10.3 FRESHWATER AND WETLANDS (AQUATICS)

During this scoping phase investigation it was found that the greatest number of impacts could occur within the construction phase, but if the High sensitivity and No-Go areas are avoided, then the impacts would be limited to a low number of road/cable and transmission line crossings only.

The final aquatic impact assessment will be conducted once the proposed designs, that take all of the development constraints into consideration in the EIA phase of the assessment. This will also then focus on any further cumulative impacts.

The following potential impacts were assessed with regard aquatic environment that would be affected by the proposed development:

- Impact 1: Loss of habitat containing protected species or Species of Special Concern;
- Impact 2: Loss of any critical corridors, important catchment areas and connected habitats that are linked to any Critical Biodiversity Areas or Ecological Support Areas;
- Impact 3: The potential spread of alien vegetation;
- Impact 4: Loss of riparian and or wetland habitat;
- Impact 5: Changes to the hydrological regime and increased potential for erosion;
- Impact 6: Changes to water quality; and

- Impact 7: Cumulative Impacts.

It was determined that the impacts on aquatic biodiversity associated with the project are of Low significance, after mitigation (Volume II: Specialist Scoping Reports) . This assumes that the mitigations listed below are considered coupled to the fact that the overall layouts have avoid any of the High / No-Go areas, unless making use of areas with impacts such as existing farm roads. However, it is assumed that the final layout will orientate the hardstands, crane pads, blade laydowns and construction camps outside of any of the No-Go areas. This also includes the current substation alternative site and O/M Buildings that are located within a sensitive aquatic area.

The loss of irreplaceable aquatic habitat and/or important aquatic obligate biota is therefore highly unlikely. The impacts can be mitigated (provided the mitigation measures and monitoring plan within the EMP and this report are implemented and adhered to during all phases of the project).

10.4 TERRESTRIAL BIODIVERSITY (FLORA AND FAUNA)

10.4.1 CONSTRUCTION AND OPERATIONAL PHASE

The proposed development is likely to result in a variety of impacts, associated largely with the disturbance, loss and transformation of intact vegetation and faunal habitat during construction. During operation, the impacts would be reduced and restricted largely to potential noise impacts and occasional disturbance from operational activities. The main terrestrial biodiversity impacts likely to result from the proposed development are summarised below:

- Vegetation - permanent or temporary loss of indigenous vegetation cover because of site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
- Flora Species – loss of flora species of special concern during pre-construction site clearing activities.
- Alien Invasive Species - susceptibility of post construction disturbed areas to invasion by exotic and alien invasive species and removal of exotic and alien invasive species during construction. Post construction disturbed areas having no vegetation cover are often susceptible to invasion by weedy and alien species, which can not only become invasive but also prevent natural flora from becoming established. Erosion – susceptibility of some areas to erosion because of construction related disturbances. Removal of vegetation cover and soil disturbance may result in some areas being susceptible to soil erosion after completion of the activity.
- Ecological Processes – the presence of construction and operational activities may result in disturbances to ecological processes.
- Faunal Habitat – permanent or temporary loss of faunal habitat due to site clearing. Site clearing before construction will result in the blanket clearing of vegetation within the affected footprint.
- Faunal Processes - the presence of construction and operational activities may result in disturbances to faunal processes.

- Faunal Species - loss of faunal SSC due to construction activities: Activities associated with bush clearing, killing of perceived dangerous fauna, may lead to increased mortalities among faunal species.
- The activity will unlikely have any direct impact on any protected environment, other than where the grid connection will feed into the substation at the south-western end. Indirect and cumulative impacts may require further assessment relating to species and processes associated with protected areas in proximity to the site.

10.5 AVIFAUNA

The following potential impacts were assessed with regard to the Avifuana environment that would be affected by the proposed development:

COLLISION MORTALITY ON WIND TURBINES

Information on the wing loading of the priority species potentially occurring regularly at the proposed WEF was not available at the time of writing. However, based on general observations, and research on related species, it can be confidently assumed that priority species that could potentially be vulnerable to wind turbine collisions due to morphological features (high wing loading) are bustards and cranes making them less manoeuvrable (Keskin et al. 2019).

Some of the regularly occurring priority species at the proposed WEF have high resolution vision areas found in the lateral fields of view, rather than frontally, e.g., the ibises, bustards, and cranes. The exceptions to this are the priority raptors which all have wider binocular fields, although as pointed out by Martin (2011, 2012), this does not necessarily result in these species being able to avoid obstacles better.

The regularly occurring priority species that could be at risk of collisions with the turbines are the following: African Fish Eagle, African Grass Owl, African Harrier-Hawk, African Marsh Harrier, Amur Falcon, Black Sparrowhawk, Black-winged Kite, Black-winged Lapwing, Black-winged Pratincole, Blue Crane, Blue Korhaan, Common Buzzard, Denham's Bustard, Greater Kestrel, Grey Crowned Crane, Grey-winged Francolin, Jackal Buzzard, Lanner Falcon, Long-crested Eagle, Marsh Owl, Martial Eagle, Montagu's Harrier, Pallid Harrier, Red-footed Falcon, Rudd's Lark, Rufous-breasted Sparrowhawk, Secretarybird, Southern Bald Ibis, Spotted Eagle-Owl, White Stork, White-bellied Bustard, Yellow-billed Stork, and Yellow-breasted Pipit. The impact is rated as High pre-mitigation and Medium post-mitigation.

South Africa is at the end of the migration path for summer migrants; therefore, the phenomenon of migratory flyways where birds are concentrated in large numbers for a limited period of time, e.g. the African Rift Valley or Mediterranean Red Sea flyways, is not a feature of the national landscape. The migratory priority species which could occur at the proposed WEF with some regularity, e.g., White Stork, Amur Falcon, and Common Buzzard will behave much the same as the resident birds once they arrive in the area. The same is valid for local migrants such as the Denham’s Bustard. It is expected that, for the

period when they are present, these species will be exposed to the same risks as resident species.

The priority species which could occur with some regularity at the proposed WEF can be classified as either: terrestrial species, soaring species, or occasional long-distance fliers. Terrestrial species spend most of the time foraging on the ground. They do not fly often and when they do, they generally fly for short distances at low to medium altitude. At the application site bustards and korhaans are included in this category. Occasional long-distance fliers generally behave as terrestrial species but can and do undertake long distance flights on occasion. Species in this category are White Stork, Denham's Bustard, Blue Crane, Grey Crowned Crane, Southern Bald Ibis, and Secretarybird. Soaring species spend a significant time on the wing in a variety of flight modes including soaring, kiting, hovering, and gliding at medium to high altitudes. At the project site, these include all the raptors. It is anticipated that most birds at the proposed WEF will avoid the wind turbines, as is generally the case at all wind farms (SNH 2010). Exceptions already mentioned are raptors that engage in hunting which might serve to distract them and place them at risk of collision, birds engaged in display behaviour or inter- and intraspecific aggressive interaction. Complete macro-avoidance of the wind farm is unlikely for any of the priority species likely to occur at the proposed WEF.

The Martial Eagle nest (coordinates on request) is the hub of the flight activity for the pair of eagles. A No-Go buffer zone of at least 5km should be implemented around the nest to reduce the risk of collisions.

Some of the wetlands and dams act as a focal point for flight activity as birds converge on the wetlands and dams, e.g. Grey Crowned Crane in some of the wetlands, and some dams with dead trees used as roosts by Southern Bald Ibis. The same could be said for the roosts and colonies of Southern bald Ibis on low cliffs which are focal points for flight activity.

The proposed Sheepmoor WEF will pose a collision risk to several priority species which could occur regularly at the site. Species exposed to this risk are large terrestrial species i.e., mostly bustards such as Blue Korhaan, Denham's Bustard, Ludwig's Bustard, and Blue Crane, although bustards and cranes generally seem to be not as vulnerable to turbine collisions as was originally anticipated (Ralston-Paton & Camagu 2019). Soaring priority species, i.e., raptors such as Martial Eagle, Cape Vulture, Lanner Falcon, Brown Snake Eagle, and Common Buzzard are most at risk of all the priority species likely to occur regularly at the project site.

There is potential for a Critically Endangered wetland species to occur in the area, further habitat modelling and investigation will be conducted during the EIA phase of the project.

In summary, the following priority species could be at risk of collisions with the turbines: African Fish Eagle, African Harrier-Hawk, African Marsh Harrier, Amur Falcon, Black Harrier, Black Sparrowhawk, Black-bellied Bustard, Black-chested Snake Eagle, Black-winged Kite, Black-winged Lapwing, Blue Crane, Blue Korhaan, Brown Snake Eagle, Cape Vulture, Common Buzzard, Denham's Bustard, Greater Flamingo, Grey Crowned Crane, Grey-winged Francolin, Jackal Buzzard, Lanner Falcon, Lesser Flamingo, Long-crested Eagle,

Marsh Owl, Martial Eagle, Northern Black Korhaan, Rufous-breasted Sparrowhawk, Secretarybird, Southern Bald Ibis, Spotted Eagle-Owl, Cape Eagle-Owl, Western Osprey, White Stork, White-bellied Bustard, and Yellow-breasted Pipit.

The up to 132kV OHL could pose a collision risk to virtually all powerline sensitive avifauna, depending on where those spans are located. Species potentially at risk are African Black Duck, African Darter, African Grass Owl, African Sacred Ibis, African Spoonbill, Black Heron, Black-bellied Bustard, Black-crowned Night Heron, Black-headed Heron, Black-necked Grebe, Blue Crane, Blue Korhaan, Blue-billed Teal, Cape Shoveler, Cape Teal, Cape Vulture, Denham's Bustard, Egyptian Goose, Fulvous Whistling Duck, Glossy Ibis, Goliath Heron, Great Egret, Greater Flamingo, Grey Crowned Crane, Grey Heron, Hadada Ibis, Hamerkop, Intermediate Egret, Lesser Flamingo, Little Egret, Little Grebe, Mallard, Marsh Owl, Northern Black Korhaan, Purple Heron, Red-billed Teal, Red-knobbed Coot, Reed Cormorant, Secretarybird, South African Shelduck, Southern Bald Ibis, Southern Pochard, Spotted Eagle-Owl, Spur-winged Goose, Squacco Heron, Wattled Crane, Western Barn Owl, Western Cattle Egret, White Stork, White-backed Duck, White-bellied Bustard, White-breasted Cormorant, White-faced Whistling Duck, and Yellow-billed Duck.

DISPLACEMENT DUE TO DISTURBANCE

A measure of displacement will inevitably take place for all priority species as a result of disturbance from construction activities during the construction phase. This will primarily affect ground-nesting species in the remaining high-quality grassland, wetlands, and wetland fringes. In addition, the Southern Bald Ibises that roost and breed on the Project Site could face a disruption of their reproductive cycle. Some species could re-colonise the area after the completion of construction. However, as a result of habitat fragmentation and operational turbines causing disturbance, other species could only partially return to their previous habitat, resulting in lower densities than before. In summary, the following species could be impacted by disturbance during the construction phase: African Fish Eagle, African Grass Owl, African Harrier-Hawk, African Marsh Harrier, Black Sparrowhawk, Black-rumped Buttonquail, Black-winged Kite, Blue Crane, Blue Korhaan, Buff-streaked Chat, Denham's Bustard, Greater Kestrel, Grey Crowned Crane, Grey-winged Francolin, Jackal Buzzard, Lanner Falcon, Long-crested Eagle, Marsh Owl, Martial Eagle, Rudd's Lark, Rufous-breasted Sparrowhawk, Secretarybird, Southern Bald Ibis, Spotted Eagle-Owl, White-bellied Bustard, and Yellow-breasted Pipit.

Powerline sensitive species which are potentially vulnerable to displacement due to disturbance are mostly ground nesting species: African Grass Owl, Black-bellied Bustard, Blue Crane, Blue Korhaan, Denham's Bustard, Grey Crowned Crane, Helmeted Guineafowl, Marsh Owl, Northern Black Korhaan, Secretarybird, Spotted Eagle-Owl and White-bellied Bustard.

DISPLACEMENT DUE TO HABITAT LOSS/TRANSFORMATION

The construction of additional roads is likely to result in habitat fragmentation, although the site already has a large number of access roads, most of which will be upgraded and utilised for the wind farm development. This, together with the disturbance factor of the operating turbines, could have an effect on the density of several species, particularly

larger terrestrial species which would utilise the remaining natural grassland, wetlands, and wetland fringes as breeding habitat. It is not expected that any priority species will be permanently displaced from the development site, but densities may be reduced. In summary, the following terrestrial species and raptors are likely to be most affected by habitat transformation: African Grass Owl, Black-rumped Buttonquail, Black-winged Lapwing, Blue Crane, Blue Korhaan, Buff-streaked Chat, Denham's Bustard, Grey Crowned Crane, Grey-winged Francolin, Marsh Owl, Rudd's Lark, Secretarybird, White-bellied Bustard and Yellow-breasted Pipit.

ELECTROCUTION ON THE 33KV MEDIUM VOLTAGE NETWORK

The following priority species are expected to be vulnerable to electrocution : African Fish Eagle, African Goshawk, African Harrier-Hawk, African Marsh Harrier, African Sacred Ibis, Amur Falcon, Black Harrier, Black Sparrowhawk, Black-chested Snake Eagle, Black-headed Heron, Black-winged Kite, Brown Snake Eagle, Cape Crow, Cape Vulture, Common Buzzard, Egyptian Goose, Grey Crowned Crane, Hadada Ibis, Hamerkop, Helmeted Guineafowl, Jackal Buzzard, Lanner Falcon, Long-crested Eagle, Marsh Owl, Martial Eagle, Pied Crow, Rock Kestrel, Rufous-breasted Sparrowhawk, Southern Bald Ibis, Spotted Eagle-Owl, Western Barn Owl, Western Cattle Egret, Western Osprey, and Yellow-billed Kite

COLLISIONS WITH THE 33KV MEDIUM VOLTAGE NETWORK

The following priority species could be vulnerable to collisions with the 33kV medium voltage lines : African Black Duck, African Darter, African Sacred Ibis, African Spoonbill, Black Heron, Black-bellied Bustard, Black-headed Heron, Black-necked Grebe, Blue Crane, Blue Korhaan, Blue-billed Teal, Cape Shoveler, Cape Teal, Cape Vulture, Denham's Bustard, Egyptian Goose, Fulvous Whistling Duck, Glossy Ibis, Goliath Heron, Great Egret, Greater Flamingo, Grey Crowned Crane, Grey Heron, Hadada Ibis, Hamerkop, Intermediate Egret, Lesser Flamingo, Little Egret, Little Grebe, Marsh Owl, Northern Black Korhaan, Purple Heron, Red-billed Teal, Red-knobbed Coot, Reed Cormorant, Secretarybird, South African Shelduck, Southern Bald Ibis, Southern Pochard, Spotted Eagle-Owl, Spur-winged Goose, Squacco Heron, Western Barn Owl, Western Cattle Egret, White Stork, White-backed Duck, White-bellied Bustard, White-breasted Cormorant, White-faced Whistling Duck, and Yellow-billed Duck

10.5.1 CUMULATIVE PHASE

The maximum number of wind turbines which are currently proposed for the other wind farms which are located within a 35km radius (i.e., Rochdale WEF and Emvelo WEF, Camden I WEF and Camden II WEF) in similar habitat around the proposed Sheepmoor WEF is 157. None of these have been constructed to date, and each of the planned projects must still be subject to a competitive bidding process where only the most competitive projects will obtain a power purchase agreement required for the project to proceed to construction. The Sheepmoor WEF will consist of up to 45 turbines, which brings the total number of potential turbines within the 35km radius to 202. The 45 turbines of Sheepmoor WEF constitute 22% of the total number of planned turbines. As such, its contribution to

the total number of turbines, and by implication the cumulative impact of all the planned turbines, is considered medium to high.

The total land parcel area where renewable energy developments are planned, including the Sheepmoor WEF, amounts to approximately 268.3km² (26,830 ha), which constitutes about 7% of the total area of similar habitat available to birds in the 35km radius around the project. The cumulative impact of the planned wind energy projects at the time of writing is considered medium as far as the creation of high-risk zones are concerned within the area contained in the 35km radius.

The land parcel area of the proposed Sheepmoor WEF (59.3 km^2) amounts to about 22% of the total amount of land parcel area designated for renewable energy developments, but less than 2% of the total area available (3848 km^2) in the 35km radius. The contribution of the Sheepmoor WEF to the cumulative impact of all the renewable energy facilities is therefore medium to low as far as potential displacement of priority species due to habitat transformation is concerned.

The are several existing OHLs in the 35km radius around the proposed Grid Connection Project, of which about 300km worth of OHL is contained in the 35km radius. The sum total of all the existing and planned HV lines in the 35km radius amounts to an estimated 383km, of which the proposed Sheepmoor WEF Grid Connection will constitute 22.3km, or about 6%. The contribution of the Sheepmoor WEF Grid Connection to the cumulative impact of all the grid connections and existing HV lines is thus low. However, the combined contribution of all the grid connections to the cumulative impact of the OHLs in the 35km radius, which is mainly collision mortality of priority species with the powerlines is high. The cumulative collision impact of all the grid connections and existing OHLs in the 35km radius is assessed to be high pre-mitigation and medium post-mitigation.

10.6 BATS

Impacts to bats are likely to occur because of the construction, operation and decommissioning of the WEF and grid connection. Potential impacts include habitat modification and disturbance, fatality due to collisions with wind turbine blades, and light pollution since these are the major impacts likely to be associated with the project (Kunz et al. 2007b, Cryan and Barclay 2009).

10.6.1 CONSTRUCTION PHASE

Removal of vegetation, noise and dust generated during construction activities, and the presence of new infrastructure in the landscape, will negatively and indirectly impact bats by removing habitat used for foraging and commuting, through disturbance, and displacement (Kunz et al. 2007b, Millon et al. 2015, Millon et al. 2018, Bennun et al. 2021, Leroux et al. 2022).

Construction of WEF infrastructure could result in destruction (direct impact) of bat roosts (rocky crevices, buildings) and disturbance (indirect impact) of bat roosts potentially resulting in roost abandonment. Bat mortality can occur if roosts containing bats are destroyed. Installation of new infrastructure in the landscape (e.g., buildings, turbines,

road culverts) can provide new roosting spaces for some bat species, attracting them to areas with wind turbines and potentially increasing the likelihood of collisions.

10.6.2 OPERATIONAL PHASE

Bat mortality (direct impact) through collisions with wind turbine blades is the principal impact of WEFs on bats (Cryan and Barclay 2009, Arnett et al. 2016).

Construction of project infrastructure will increase ecological light pollution from artificial lighting associated with the substation and other operational and maintenance buildings. Light pollution can alter ecological dynamics (Horváth et al. 2009). Lighting attracts and can cause direct mortality of insects, reducing the prey base for bats, especially bat species that are light-phobic. These species may also be displaced from previous foraging areas due to lighting. Other bat species forage around lights, attracted by higher numbers of insects. This may bring these species into the vicinity of the project and indirectly increase the risk of collision with wind turbines.

The direct impact of grid connection infrastructure is collisions with powerlines. Insectivorous bats are unlikely to collide with powerlines since they can avoid these obstacles using echolocation, but fruit bats do collide with powerlines (Tella et al. 2020), although the likelihood of occurrence for fruit bats species in the AoI is low. Indirect impacts include loss of habitat to construct substations and OHL pylons, and ecological light pollution (Longcore and Rich 2004).

Construction of grid infrastructure will also increase ecological light pollution from artificial lighting associated with the substation and other operational and maintenance buildings. Light pollution can alter ecological dynamics (Horváth et al. 2009). Lighting attracts and can cause direct mortality of insects, reducing the prey base for bats, especially bat species that are light-phobic. These species may also be displaced from previous foraging areas due to lighting. Other bat species forage around lights, attracted by higher numbers of insects. This may bring these species into the vicinity of the project and indirectly increase the risk of collision with wind turbines.

10.6.3 DECOMMISSIONING PHASE

Impacts during the decommissioning phase will be indirect and involve disturbance to bats through excessive noise and dust, and damage to vegetation.

10.7 SOCIO-ECONOMIC

10.7.1 CONSTRUCTION PHASE

The key potential social impacts during the construction phase include:

POTENTIAL POSITIVE IMPACTS

- Creation of employment and business opportunities, and opportunity for skills development and on-site training.

POTENTIAL NEGATIVE IMPACTS

- Impacts associated with the presence of construction workers on local communities;

- Impacts related to the potential influx of jobseekers;
- Increased risks to livestock and farming infrastructure associated with the construction related activities and presence of construction workers on the site;
- Increased risk of grass fires associated with construction related activities;
- Nuisance impacts, such as noise, dust, and safety, associated with construction related activities and vehicles; and
- Impact on productive farmland.

The construction phase will extend over a period of approximately 18-24 months and create in the region of 200-250 employment opportunities that will benefit members from the local communities in the area, specifically Ermelo. These opportunities will include opportunities for low, semi and highly workers. Most of the employment opportunities will accrue to Historically Disadvantaged (HD) members of the community. A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area, specifically Ermelo. Given relatively high local unemployment levels and limited job opportunities in the area, this will represent a significant, if localised, social benefit. Based on information from similar projects the total wage bill will be in the region of R 25 million (2023 Rand values). A percentage of the wage bill will be spent in the local economy which will also create opportunities for local businesses in the local towns in the area.

IMPACTS ASSOCIATED WITH THE PRESENCE OF CONSTRUCTION WORKERS ON LOCAL COMMUNITIES

The presence of construction workers poses a potential risk to family structures and social networks. While the presence of construction workers does not in itself constitute a social impact, the manner in which construction workers conduct themselves can impact on local communities. The most significant negative impact is associated with the disruption of existing family structures and social networks. This risk is linked to potentially risky behaviour, mainly of male construction workers, including:

- An increase in alcohol and drug use;
- An increase in crime levels;
- The loss of girlfriends and/or wives to construction workers;
- An increase in teenage and unwanted pregnancies;
- An increase in prostitution; and
- An increase in sexually transmitted diseases (STDs), including HIV.

IMPACTS RELATED TO THE POTENTIAL INFLUX OF JOBSEEKERS

Large construction projects tend to attract people to the area in the hope that they will secure a job, even if it is a temporary job. These job seekers can in turn become "economically stranded" in the area or decide to stay on irrespective of finding a job or not. While the proposed project on its own does not constitute a large construction project, the establishment of a number of renewable energy projects in the area may attract job seekers to the area. As in the case of construction workers employed on the project, the actual presence of job seekers in the area does not in itself constitute a social impact.

However, the way in which they conduct themselves can impact on the local community. The main areas of concern associated with the influx of job seekers include:

- Impacts on existing social networks and community structures;
- Competition for housing, specifically low-cost housing;
- Competition for scarce jobs; and
- Increase in incidences of crime.

INCREASED RISKS TO LIVESTOCK AND FARMING INFRASTRUCTURE ASSOCIATED WITH THE CONSTRUCTION RELATED ACTIVITIES AND PRESENCE OF CONSTRUCTION WORKERS ON THE SITE

The presence on and movement of construction workers on and off the site poses a potential safety threat to local famers and farm workers in the vicinity of the site. In addition, farm infrastructure, such as fences and gates, may be damaged and stock losses may also result from gates being left open and/or fences being damaged, or stock theft linked either directly or indirectly to the presence of farm workers on the site. The potential risks (safety, livestock, and farm infrastructure) can be effectively mitigated by careful planning and managing the movement of construction on and off the site workers during the construction phase.

INCREASED RISK OF GRASS FIRES ASSOCIATED WITH CONSTRUCTION RELATED ACTIVITIES

The presence of construction workers and construction-related activities on the site poses an increased risk of grass fires that could, in turn pose, a threat to livestock, crops, wildlife and farm infrastructure. The local landowners indicated that the area is very susceptible to grass fires during the winter months (May-October) and that the veld can take up to 3 years to recover to full productivity.

NUISANCE IMPACTS, SUCH AS NOISE, DUST, AND SAFETY, ASSOCIATED WITH CONSTRUCTION RELATED ACTIVITIES AND VEHICLES

Construction activities on site and movement of heavy construction vehicles during the construction phase has the potential to create noise and dust impacts, damage local roads and create safety impacts for other road users. Potential dust and noise impacts associated with the construction phase are likely to be limited. The traffic related impacts associated with the transport of materials to the site can also be effectively managed if the required mitigation measures are implemented.

IMPACT ON PRODUCTIVE FARMLAND

The activities associated with the construction phase and establishment of the proposed project and associated infrastructure will result in the disturbance and loss of land available for crops and grazing. However, experience from other WEFs is that impact on farming operations can be effectively minimised and mitigated by careful planning in the final layout of the proposed WEF and associated components. The impact on farmland associated with the construction phase can also be mitigated by minimising the footprint

of the construction related activities and ensuring that disturbed areas are fully rehabilitated on completion of the construction phase. Recommended mitigation measures are outlined below.

The timing / phasing on construction activities should where possible also be planned to avoid and or minimise disruption to planning and harvesting operations. Affected landowners should be involved in planning of timing of construction activities. Consideration should also be given to planning the construction activities so as to ensure arable areas remain productive for as long as possible, i.e., are not withdrawn from production months in advance. Ideally, construction should start after harvesting and be planned to reduce disruptions to the following planting season.

10.7.2 OPERATIONAL PHASE

The following key social issues are of relevance to the operational phase:

POTENTIAL POSITIVE IMPACTS

- The establishment of infrastructure to improve energy security and support renewable sector;
- Creation of employment opportunities;
- Benefits to the affected landowners; and
- Benefits associated with the socio-economic contributions to community development.

POTENTIAL NEGATIVE IMPACTS

- Impact on property values; and
- Impact on tourism.

THE ESTABLISHMENT OF INFRASTRUCTURE TO IMPROVE ENERGY SECURITY AND SUPPORT RENEWABLE SECTOR

The primary goal of the proposed project is to improve energy security in South Africa by generating additional energy. The proposed WEF also reduces the carbon footprint associated with energy generation. The project should therefore be viewed within the context of the South Africa's current reliance on coal powered energy to meet the majority of its energy needs, and secondly, within the context of the success of the REIPPPP.

IMPACT ON PROPERTY VALUES

A literature review was undertaken as part of the SIA. It should be noted that the review does not constitute a property evaluation study and merely seeks to comment on the potential impact of WEFs on property values based on the findings of studies undertaken overseas. The assessment rating is based on the findings of the review. Based on the findings of the literature review the potential impact of WEFs on rural property values is likely to be low, specifically for farms that are farmed as productive farms. As indicated above, the potential loss of productive land and the associated potential impact on property values can also be minimised by careful planning and siting of wind turbines.

IMPACT ON TOURISM

A review of international literature in the impact of wind farms was undertaken. Based on the findings of the review there is limited evidence to suggest that the proposed WEF would impact on the tourism in the area. As indicated above, the area has also been impacted by the Camden Power Station and associated transmission lines and large-scale coal mining.

10.7.3 DECOMMISSIONING PHASE

Typically, the major social impacts associated with the decommissioning phase are linked to the loss of jobs and associated income. This has implications for the households who are directly affected, the communities within which they live, and the relevant local authorities. However, in the case of the proposed facility the decommissioning phase is likely to involve the disassembly and replacement of the existing components with more modern technology. This is likely to take place in the 20 - 25 years post commissioning. The decommissioning phase is therefore likely to create additional, construction type jobs, as opposed to the jobs losses typically associated with decommissioning. The number of people employed during the operational phase will be in the region of 20. Given the low number of people employed during the operational phase the decommissioning of the facility will not have a significant negative social impact on the local community. The potential impacts associated with the decommissioning phase can also be effectively managed with the implementation of a retrenchment and downscaling programme.

The decommissioning phase will also create employment opportunities. This will represent a positive impact. These jobs will, however, be temporary.

10.7.4 CUMULATIVE PHASE

CUMULATIVE IMPACT ON SENSE OF PLACE

The potential cumulative impacts on the areas sense of place will be largely linked to potential visual impacts. The establishment of the WEF and other WEFs in the area will create the potential for combined and sequential visibility impacts. The impact on sense of place will be informed by the findings of the VIA.

CUMULATIVE IMPACT ON LOCAL SERVICES AND ACCOMMODATION

The objective will be to source as many low and semi-skilled workers for the construction phase from the MM, specifically Ermelo. This will reduce the pressure on local services and accommodation in Ermelo. For a single WEF project ~ 200-250 workers may require accommodation. In the event of the construction phase for 3 projects overlapping, the total number of workers requiring accommodation would be between 500 and 600. The potential pressure on local services will depend on the number of locally based contractors and workers that are employed during the construction phase.

The potential impact should also be viewed within the context of the potential positive cumulative impacts for the local economy associated with the establishment of the proposed facility and associated renewable energy projects in the MM. These benefits will

create opportunities for investment in the MM, including the opportunity to up-grade and expand existing services and the construction of new houses. Socio-economic development (SED) contributions also represent an important focus of the REIPPPP and is aimed at ensuring that the build programme secures sustainable value for the country and enables local communities to benefit directly from the investments attracted into the area. The proposed WEF is also required to contribute a percentage of projected revenues accrued over the 20-year period to SED. This will provide revenue that can be used by the MM to invest in up-grading local services where required. In should also be noted that it is the function of national, provincial, and local government to address the needs created by development and provide the required services. The additional demand for services and accommodation created by the establishment of development renewable energy projects should therefore be addressed in the Integrated Development Planning process undertaken by the MM.

CUMULATIVE IMPACT ON LOCAL ECONOMY

In addition to the potential negative impacts, the establishment of renewable energy facilities and associated infrastructure, including the proposed WEF, will also create several socio-economic opportunities for the MLM. The positive cumulative opportunities include creation of employment, skills development and training opportunities, and downstream business opportunities. The potential cumulative benefits are associated with both the construction and operational phase of renewable energy projects and associated infrastructure and extend over a period of 20-25 years. However, steps must be taken to maximise employment opportunities for members from the local communities in the area and support skills development and training programmes.

10.8 HERITAGE, ARCHAEOLOGY AND PALAEONTOLOGY

10.8.1 CONSTRUCTION, OPERATIONAL AND DECOMMISSIONING PHASE

The field survey was undertaken in mid-May 2023. Ground visibility varied from good to poor. Sites in the grassland were visible as general features and sometimes specific features were noted. This was dependent on the type and length of grass.

The black wattle woodlots have greatly expanded and covered many of the settlements form the desktop study. There was no evidence of these settlements where access through the woodlots was possible. The Black Wattle has literally destroyed the sites and any potential graves. The situation is exacerbated by the current program of removing the black wattle being removed by bulldozers in some areas.

Many of the desktop sites are also in fields that have been converted to agricultural activity. While several areas have kept known graves intact, within these fields, others have not. In this way, large wattle woodlots and agricultural fields were omitted from the survey. Grasslands were not omitted.

A general statement regarding settlements and graves can be made from the survey. Those settlements that were surveyed tend to have human graves associated with them. The desktop settlements that could not be surveyed for various reasons, many still have graves associated with them. They would be subsurface and in various states of

preservation. These latter settlements should be treated as sensitive for potential graves, but do not need to be treated as a red flag, Table 10.1: below lists recorded sites.

TABLE 10.1: LOCATION AND DESCRIPTION OF RECORDED SITES

Name	Latitude	Longitude	Description	Significance
SHMO01	-26.560928210	30.269447152	about 20 graves	HIGH
SHMO02	-26.562187688	30.270367007	Kraal	LOW
SHMO03	-26.569013053	30.280872595	raised floor with surround wall. 5m floor. perimeter 2all 2m from wall quarry	LOW-MEDIUM
SHMO04	-26.569869600	30.281628800	3x circular depressions	LOW
SHMO05	-26.571969315	30.283061556	grave? walling	HIGH
SHMO07	-26.570633800	30.264904684	Roodewal (original)	HIGH
SHMO08	-26.565956500	30.293699000	Cemetery	HIGH
SHMO09	-26.570522600	30.287594200	Row of Stellae	LOW
SHMO010	-26.571229644	30.290122635	raised area, rectangular walling, walling, grave	HIGH
SHMO011	-26.574274200	30.295731100	settlement 59, x5 houses	UNKNOWN
SHMO012	-26.594659425	30.297017448	Battle of Onverwacht	HIGH
SHMO013	-26.595416978	30.295015961	8 graves. memorial	HIGH
SHMO014	-26.598487400	30.294995900	small kraal	LOW
SHMO015	-26.598286500	30.268117800	Potential old settlement	LOW
SHMO016	-26.609387400	30.278318600	grave, 2000 onwards	HIGH
SHMO017	-26.606701315	30.291456770	Cemetery, walling, kraal	HIGH
SHMO018	-26.608241900	30.291393900	grave	HIGH
SHMO019	-26.613500900	30.263849800	cemetery	HIGH
SHMO020	-26.611976600	30.265673200	walling and S68	LOW

SHMO021	-26.621851087	30.261415988	about 12 graves, S70	HIGH
SHMO022	-26.622540900	30.268862500	12 or more. some last 10yrs, S71	HIGH
SHMO023	-26.630675200	30.242204300	grave? or cairn	UNKNOWN
SHMO024	-26.639590197	30.240082620	s74?	HIGH
SHMO025	-26.639396479	30.243493494	s75	HIGH
SHMO026	-26.647994411	30.255013830	Walling, graves	HIGH
SHMO027	-26.656540275	30.258241199	Collapsed feature	LOW
SHMO028	-26.665684000	30.254872200	kraal	LOW
SHMO029	-26.678447412	30.241223006	small kraal	LOW
SHMO030	-26.633880957	30.259122815	approx location of cemetery	HIGH
SHMO031	-26.656889774	30.263701535	graves	HIGH
SHMO032	-26.582043622	30.262985256	Onverwacht 2	UNKNOWN
SHMO033	-26.583679233	30.269778279	Onverwacht 2	UNKNOWN
SHMO034	-26.612748678	30.273965712	Onverwacht 3	LOW
SHMO035	-26.632645013	30.264438540	Onverwacht 4, 1910 built and cemetery	HIGH

With reference to Table 10.1:, the following should be noted when considering potential impacts:

- The current layout will affect six sites: SHMO01, SHMO010, SHMO011, SHMO012, SHMO016, and SHMO034.
- SHMO01 will be too near the turbine footprint and the footprint will need to shifted to ensure that it does not encroach on the buffer of the cemetery.
- SHMO10 and SHMO011 have the potential to be affected by the access roads and O&M area and Substation. The area will need to be resurveyed after the area has been burnt for possible graves at SHMO011 or features near SHMO010. As an alternative, siting of this infrastructure should be such that it avoids this area.

- SHMO012 is part of the Battle of Onverwacht. Turbine 11 is too close to one of the features from the battlefield and needs to be moved if possible.
- SHMO016 is just outside of the Preferred Substation footprint; however, it currently does not meet the 20m buffer requirement.
- SHMO036 are recent farm buildings. No further action is required.

10.9 VISUAL / LANDSCAPE AND FLICKER

10.9.1 CONSTRUCTION PHASE

Construction activities include the removal of vegetation, earthworks required to create building terraces for internal substations and preparation of the internal roads, as well as excavations for the turbine structures foundations associated infrastructure and the clearing of vegetation for access roads. Construction activities would potentially negatively affect the landscape's visual quality and sense of place relative to its baseline. They would contrast with the patterns that define the structure of the landscape.

The impact on the visual environment during the construction phase is assessed to have a potential medium severity over a local area (but extend beyond the site boundary to at least at 8,0km) and would occur over the short-term (less than five years) resulting in a medium consequence.

Additionally, impact on the visual environment during the construction phase for the Grid Connection is assessed to have a potential medium severity over a local area (but extend beyond the site boundary to at least at 5,0km) and would occur over the short-term (less than five years) resulting in a medium consequence.

10.9.2 OPERATIONAL PHASE

Operational activities include the regular maintenance of the wind turbines, vegetation management under and around the structures and maintenance of all other infrastructural components. Security lighting, aviation hazard flashing lights, and other lighting associated with the movement of security vehicles at night. These activities along with the physical presence of the Project components day and night, constitute the visual impact.

The worst-case impact on the visual environment during the operational phase is assessed to have a high severity over a widespread area and would occur over the medium-term (anticipated to be twenty-five years) resulting in a high consequence.

Additionally, the worst-case impact on the visual environment during the operational phase for the Grid connection is assessed to have a medium severity over a regional area and would occur over the medium-term (anticipated to be thirty years) resulting in a medium consequence.

10.9.3 DECOMMISSIONING PHASE

Decommissioning and closure activities include the dismantling and removal of infrastructure and the rehabilitation of the site back to its current, mostly natural, state.

The impact on the visual environment during this phase for the WEF and Grid Infrastructure is assessed to have a medium intensity over a local area and would occur over the short-term (less than five years) resulting in a low consequence.

10.9.4 CUMULATIVE PHASE

The cumulative impact of the Project is HIGH. The Sheepmoor WEF will be seen together with the other two proposed WEF's (Rochdale and Emvelo) that are planned. These, together with the proposed new transmission power lines running south and through the study area, as well as the existing Camdon power station and powerlines, contribute to the cumulative effect of power infrastructure in the sub-region.

The combined effect of proposed WEF project and the existing power infrastructure and associated infrastructure would cause a major change the nature, sense of study and character of the sub-region's landscape's baseline.

10.10 TRAFFIC AND TRANSPORTATION

10.10.1 CONSTRUCTION AND DECOMMISSIONING PHASE

Heavy vehicles traffic during both construction and decommissioning phase of the development are expected to cause additional wear and tear on the surrounding road network. The gravel roads to the sites are also expected to sustain damage during the construction and decommissioning phase of the project (i.e., surface distress - gravel loss leading to damage to the existing gravel road layers and rutting).

Heavy vehicles are expected to cause dust along unpaved access roads to the site during the transportation of various components to the site leading to possible loss of visibility from a safety point of view, health, damage to roadside vegetation and environmental impact such as air pollution.

The project will inevitably result in the disruption of traffic on Local, Regional, and National Routes but to some varying degrees. The severity of the impacts will depend on the order of the road (how many lanes, width, length, turns, etc.), the receiving environment and vicinity of land uses and towns. Additional traffic on the road network could result in changes to the operations of that road network. The severity of the impacts will depend on the expected traffic to be generated by the proposed development. A full traffic impact assessment will be required to estimate the volume of traffic associated with the transportation of personnel and materials/components during the construction and operation phases.

The project will inevitably result in the movement of abnormal loads on Local, Regional and National Routes, but to varying degrees. The severity of the impacts will depend on the travelling speed, size and loaded height of the abnormal vehicles expected. Thus, additional abnormal traffic on the road network could result in changes to the operational performance/level of service of that road network.

The operational phase is expected to have comparatively minimal traffic impact as the only transport required will be associated with monitoring, operation, and maintenance.

For the operational phase of the wind farm, the following assumptions will be made for trip estimations purposes:

- Onsite permanent staff consisting of operational and maintenance teams;
- Daily labour transportation modes; and
- Occasional major repair/servicing events.

The overall potential impact is expected to be moderate to low during both the construction phase and operational phase, respectively.

10.10.2 CUMULATIVE IMPACTS

It is understood that there are currently no planned or approved Renewable Energy Facilities within 35 km of the Mulilo WEF Cluster based on the data using the REEA_OR_2022_Q4. Hence the only developments to be considered are 2 of the 3 proposed Mulilo WEF Clusters namely, Emvelo WEF and Rochdale WEF.

The addition of other WEFs in the area is expected to increase the overall development impact due to increased construction-related activities. However, some impacts will be unavoidable but can remain within acceptance tolerances.

The overall development impacts are expected to be of low to moderate negative significance post mitigation through appropriate measures.

11. SUMMARY OF FINDINGS AND CONCLUSION

11.1 SOIL AND AGRICULTURAL POTENTIAL

The overall conclusion of this assessment is that the proposed development offers a valuable opportunity for integrating renewable energy with agricultural production in a way that provides benefits to agriculture but leads to insignificant loss of future agricultural production potential.

The site is classified as ranging from low to very high agricultural sensitivity by the screening tool. This site sensitivity verification verifies those parts of the site that are indicated as cropland in this assessment as being of high agricultural sensitivity (or very high for irrigated cropland), and the rest of the site as being of medium agricultural sensitivity.

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

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

An agricultural impact is a change to the future agricultural production potential of land. This is primarily caused by the exclusion of agriculture from the footprint of a development. In the case of wind farms, the amount of land excluded from agriculture is so small that the total extent of the loss of future agricultural production potential is insignificantly small, regardless of how much production potential the land has, and regardless of the duration of the impact. Furthermore, wind farms have both positive and negative effects on the production potential of land, and it is the net sum of these positive and negative effects that determines the extent of the change in future production potential. The positive effects are:

- Increased financial security for farming;
- Improved security against stock theft and other crime; and
- An improved road network, with associated storm water handling system.

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

Its acceptability is further substantiated by the following points:

- The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy.
- In addition, the proposed development will contribute to the country's urgent need for energy generation, particularly renewable energy that has much lower environmental and agricultural impact than existing, coal powered energy generation.
- All renewable energy development in South Africa decreases the need for coal power and thereby contributes to reducing the large agricultural impact that open cast coal mining has on highly productive agricultural land throughout the coal mining areas of the country. Furthermore, a reduction in coal power saves water resources and therefore potentially makes more water available for irrigated agriculture.

11.2 NOISE

A site sensitivity verification and scoping level assessment of the predicted noise environment due to the development of the WEF was undertaken.

This assessment is based on a desktop assessment as well as a basic predictive model to identify potential issues of concern. Wind turbines do emit noises at sufficient levels to propagate over large distances and this assessment indicates a potential noise impact on the closest receptors.

Considering the preliminary wind turbine layout (which will be updated in response to specialist findings, resource and technical optimisation for the EIA Phase), there is a potential of a low to medium significance of a noise impact during the construction phase, and of a low to high significance during the operational phase on the different identified NSR. It should be noted that mitigation measures would be identified and recommended during the environmental noise impact assessment, which would reduce the significance to low.

Further study is required, and it is recommended that a full Environmental Noise Impact Assessment study be conducted for the proposed Sheepmoor WEF.

11.3 FRESHWATER AND WETLANDS (AQUATICS)

During this assessment, several sensitive aquatic habitats were observed and are shown in the maps provided in this report. Noteworthy areas, were then avoided by the required infrastructure, and include the main riverine and wetland systems, while the access roads could will make use of existing roads thus previously disturbed areas. The current substation site and O/M Buildings are located within a sensitive aquatic area and the localities will need to be adjusted or not utilised where relevant.

If this is carried out, then the specialist has no objection to the authorisation of the proposed activities assuming that all mitigations and buffer zones are implemented.

Mitigation should focus on these areas and include measures to halt erosion and rehabilitate habitat in the sections affected by the construction. Without the implementation of mitigation measures, the project has potential to cause a Moderate

cumulative impact upon aquatic biodiversity. However, with the adoption of mitigation, the proposed project will have a Low impact upon aquatic biodiversity.

As the proposed activities have the potential to create erosion the following recommendations are reiterated:

- Vegetation clearing should occur in a phased manner in accordance with the construction programme to minimise erosion and/or run-off. Large tracts of bare soil will either cause dust pollution or quickly erode and then cause sedimentation in the lower portions of the catchment, and suitable dust and erosion control mitigation measures should be included in the generic EMPr, if not included already to mitigate.
- All construction materials including fuels and oil should be stored in demarcated areas that are contained within berms / bunds to avoid spread of any contamination / leaks. Washing and cleaning of equipment should also be done in berms or bunds, to trap any cement / hazardous substances and prevent excessive soil erosion. Mechanical plant and bowsers must not be refuelled or serviced within or directly adjacent to any channel. It is therefore suggested that all construction camps, lay down areas, batching plants or areas and any stores should be located more than 50 m from any demarcated watercourses.
- It is also advised that an Environmental Control Officer (ECO), with a good understanding of the local flora be appointed during the construction phase. The ECO should be able to make clear recommendations with regards to the re-vegetation of the newly completed / disturbed areas along aquatic features, using selected species detailed in this report.
- All alien plant re-growth must be monitored and should these alien plants reoccur, then these plants should be re-eradicated. The scale of the operation does however not warrant the use of a Landscape Architect and / or Landscape Contractor.

It is further recommended from the project onset that all watercourse areas (inclusive of buffers) are included into any existing EMPr as reference, this to ensure a net benefit to the aquatic environment. This should from part of the suggested walk down as part of the final EMP preparation.

11.4 TERRESTRIAL BIODIVERSITY (FLORA AND FAUNA)

Further to the above assessment, analysis of the site and surrounding area, indicates that the area is generally highly fragmented from historical and present agriculture in the wider area. The surrounding landscape is typically comprised of a mosaic of cultivated fields, pastures, dryland pastures and other rural infrastructure interspersed with natural or intact vegetated (undeveloped) areas. A network of watercourses and vleis also bisect the landscape, generally providing the most undisturbed habitat as well as key ecological corridors. The specific site is comprised of a mix of natural vegetation, secondary vegetation (old lands) and cultivated lands, as well as areas that are periodically mowed for harvesting of hay.

Although highly fragmented, functionally speaking, ecological connectively is indirectly maintained in such areas, functioning as a broader ecologically connected unit through the

mosaic of remnant intact patches, as well as old lands where ecological processes will persist. Watercourses appear to form the primary connection as they are generally less modified and in a more natural state. It is likely that large natural vegetation patches are used as grazing and are likely to exhibit some level of degradation. Such areas more than likely also have marginal agricultural value, otherwise they would more than likely have been cultivated. Extensive areas are also maintained as dryland pastures that are periodically mowed for pastures. Old lands, having secondary vegetation, more than likely also have marginal agriculture value, hence they are no longer used. Such areas are potentially either rocky or exhibit seasonal waterlogging (i.e., wetlands or watercourses), both of which could provide habitat for a suite of flora and fauna that are not characteristic of the surrounding homogenous grassland. In other instances, some areas are likely also rested periodically for a few years, before being used again.

Intact vegetation on site is of conservation value, being designated Optimal CBA, with some corridors associated with watercourses being designated Irreplaceable CBA, due to the elevated conservation status of the vegetation unit (Vulnerable). Several areas have also been designated ESA (local corridor or species). As is evident from land-use coverages, the wider area is highly fragmented because of land-use, including agriculture, mining, industrial and urbanisation. The degraded, secondary vegetation (old lands) and cultivated areas are not any designated CBA status. Land use guidelines for the various categories indicate the following:

- Irreplaceable Terrestrial CBA sites must be avoided in terms of the mitigation hierarchy.
- Aquatic ESA: Important sub-catchments: Not recommended and should be avoided, unless not aquatic impact is confirmed.
- Aquatic: All rivers, wetlands, dams to be avoided including respective 32 m and 100 m buffers. Limited linear activities such as roads and powerlines may be required in these areas and should be assessed accordingly on a case-by-case basis in order to minimise impacts.
- Terrestrial ESA: local corridor and species areas must also be avoided in terms of the mitigation hierarchy. Further investigation may be required in the species area, to ascertain species and processes, which may or may not accommodate certain infrastructure.
- Terrestrial Optimal CBA (referred to as Important and necessary in Mpumalanga Biodiversity Convservation plan (MBCP)), the guidelines indicate that, although not desirable, if small-scale land-use change is unavoidable, it must be located and designed to be as biodiversity-sensitive as possible. It is thus feasible that a portion of the natural vegetation within the designated CBA (optimal) areas could be developed, in a biodiversity sensitive manner if combined with use of ONA or transformed areas. This would entail identifying any areas that are less sensitive as well as maintaining ecological connectivity across the site and with surrounding landscape, as well as adhering to conservation targets for the vegetation unit; and
- Terrestrial other natural areas (ONA) and modified sites would provide the most suitable footprint for the proposed WEF facility. Old lands and current lands as well as

areas where hay harvesting is periodically undertaken may require assessment by an agricultural specialist in order to determine an optimised footprint where agricultural sustainability of the site is not significantly altered, outside of the scope of this screening.

Preferred areas would thus be low aquatic and/or terrestrial sensitivity areas, flowed by moderate sensitivity areas (where strategic footprints would need to follow a clear mitigation process and rationale). The connectivity to the surrounding landscape is complex, and generally follows the watercourses and/or remnant vegetation pockets of Eastern Highveld Grassland. Other Natural areas, generally moderate sensitivity, would provide the most suitable footprint, but a blended approach is recommended, which will spread the footprint strategically over other natural areas and perhaps more marginal agricultural areas or partially overlapping with cultivated areas.

Several smaller footprints having a low/moderate sensitivity are not delineated, but these may be most suited for small footprints (i.e., WEF, substation or BESS infrastructure) Connectivity with surrounding landscape should none-the-less be retained, which may include a buffer along any boundaries.

The recently published Biodiversity Offset Guidelines may have implications regarding the extent to which there are footprints within the CBA/ESA designated areas (red, orange and yellow on the MBSP map). Specifically relating to WEF projects, impact significance after mitigation tends to be low due to the dispersed nature of the footprint. In general ESA would be more accommodating to loss than CBA for a WEF.

Eastern Highveld Grassland has an Endangered status, with some remnant but fragmented patches on the site, the largest area being on Rochdale to the north, but also patches mostly around the western edges of Sheepmoor and the Eastern Edges of Emvelo following valleys. As above, Biodiversity Offsets may be applicable, the red CBA areas on the map generally correspond to the remnant pockets of this unit, which are deemed Irreplaceable. Depending on final loss, Biodiversity Offsets may be applicable, but unlikely due to negligible footprint size of WEF turbines in relation to the remaining extent of the vegetation unit coupled with on-site degradation. Large areas of invaded wattle thicket are present and would provide opportunity for development as these would be considered significantly degraded.

The other vegetation unit which comprises most of the central and mountainous part of the site is Wakkerstroom Montane Grassland which has a least concern status. Intact areas have been designated a Moderate sensitivity.

Based on available ecosystem-level data for habitat and important biodiversity areas falling within the project development site, it is considered that the project will range from low to high sensitivity for the faunal SCC assessed, additionally, based on the available species-level information on the two SCCs' distributions, their known habitat preferences, the intact and natural to heavily transformed habitat of the project development site, it is considered that the project will range from low to high sensitivity for the faunal SCC assessed.

The proposed development will most likely have a low impact within areas of low sensitivity (transformed areas), and a medium to high impact within areas of potentially high faunal sensitivity (intact natural habitat, ecological corridors, and certain landscape features). National and regional strategic biodiversity plans indicate that areas of the project site are of high faunal importance:

The project area falls over CBAs of different sub-categories, including ESAs of local and landscape ecological corridors, classed by the Mpumalanga Biodiversity Sector Plan. The most important and optimal CBAs have been classed using, amongst other biodiversity datasets, several different animal datasets (e.g. butterfly, dragonfly, reptile, amphibian, and bird) and therefore are considered as an accurate representative of areas of general faunal importance.

The project area also bisects ecosystem types with a South African Red List of Ecosystems Status of Endangered and that still retain much of their natural extent.

The project area:

- Bisects a priority focus area identified by the national protected areas expansion strategy for South Africa (NPAES);
- Falls over a recognised South African Important Bird Area; and
- Has vegetation and habitat (topography) that should support both the katydid and Oribi. In addition, the sighting of the Oribi by the avifaunal specialists, and after speaking with local landowners, confirms that this SCC is known from the project site and surrounding areas.

If the development is focussed on Low sensitive areas, then potentially the development will only have small, localised impacts on the two SCC and additional surveys, such as micro-siting, and full impact assessments will likely not be necessary.

Within the proposed development, areas of High sensitivity are associated with:

- Intact areas of natural vegetation suitable for the SCC: These areas, and areas that have also been classed as of high importance within biodiversity spatial plans, should ideally be excluded from development and a ~100m proposed buffer line is recommended to prevent undue disturbance.
- Areas that provide important habitat features associated with altitude and topography, particularly for the Oribi. These areas should ideally be excluded from development and a ~100m proposed buffer line is recommended to prevent undue disturbance of these areas.
- Areas that provide faunal connectivity through ecological/habitat corridors. These areas should ideally be excluded from development and a ~100m proposed buffer line is recommended for all corridors. In addition, these corridors would need to be considered within the broader context of the three planned WEFs to ensure that connectivity is maintained across the three development areas and surrounding areas.
- All invasive alien plants must be cleared from the project site and a management and monitoring plan should be stipulated as part of the EMPr for the Sheepmoor WEF project. The threat from alien invasive plants constitutes a potentially greater threat

and impact on faunal SCC than the impacts from the development. Removal and management of the invasive plants could potentially have a High positive impact for the SCC and other fauna within the project area.

If the above concerns can be accommodated, then a compliance statement of low sensitivity will potentially hold for Sheepmoor WEF.

11.5 AVIFAUNA

It is imperative that the proposed 45-turbine layout be revised to avoid the recommended avifaunal no-go areas and turbine exclusion zones, including the rotor-swept areas. The proposed Sheepmoor WEF is expected to have high and medium impacts on avifauna pre-mitigation, which must be mitigated through appropriate measures to reduce the impact to a medium and low level.

The proposed Sheepmoor WEF Grid Connection will have a moderate impact on avifauna which, in most instances, could be reduced to a low impact through appropriate mitigation. From an avifaunal perspective OHL Alternatives 1, 2, and 3 are least preferred as they have the longest span length and therefore pose a higher collision risk to birds. The Preferred OHL Alternative is preferred from an avifaunal perspective as it has the shortest span length (22.3 km). The development is supported, provided the mitigation measures listed in this report are strictly implemented.

The following Very high and High environmental sensitivity was identified from an avifaunal perspective for the proposed wind energy facility:

VERY HIGH SENSITIVITY – ALL INFRASTRUCTURE EXCLUSION ZONES.

- A 2.5km No-Go zone around the identified Martial Eagle nest should be implemented and maintained to reduce the risk of collision mortality and displacement due to disturbance.
- All wetland No-Go areas as identified by the Aquatic Specialist should be buffered by an additional 110m on either side to reduce the risk of turbine collisions and to prevent the disturbance of priority species breeding and roosting in these areas. Priority species in this category include African Fish Eagle, African Grass Owl, African Marsh Harrier, Black-winged Pratincole, Blue Crane, Grey Crowned Crane, Long-crested Eagle, Marsh Owl, Yellow-billed Stork, and sensitive Species Number 23 (as listed by the National Screening Tool). During the EIA Phase fine scale habitat modelling and identification of wetland corridors for cryptic / low detection probability wetland species will be conducted. Two forms of risk zones will be delineated, namely core breeding habitat, and associated connectivity habitat. Connectivity habitat will include wetland habitats not used for breeding but for movement, as well as wetland/grassland margins. These features will need to be buffered to account for the sensitivity of the respective species involved.
- Modelled Yellow-breasted Pipit and Rudd’s Lark habitat areas are considered No-Go zones. These high-quality grassland areas were identified to prevent displacement of birds due to disturbance and habitat destruction. The Yellow-breasted Pipit and Rudd's Lark model output represents the habitat patches most suitable for the

species' using a multi-year assessment of imagery indices etc. spanning 2019–2023. This is to account for variability related to drivers of habitat suitability for grassland habitat specialist species such as these endemic larks and pipit. Primary drivers of variability include seasonal rainfall across years, burning/fire, and grazing intensity. The model boundaries will extend beyond suitable habitat into other habitats (forest edge, roads, etc.) in some areas as we have accounted for typical blade swept area (BSA) by buffering the habitat output. This output should be considered high sensitivity and avoided (no-go) given habitat loss/degradation is the primary issue. Although Botha's Larks were not observed on site during the extensive surveys conducted further investigations regarding habitat suitability will be conducted through modelling during the EIA phase of the project. This will be done to understand if the proposed development poses any risk to the species.

HIGH SENSITIVITY – TURBINE EXCLUSION ZONES

- A Martial Eagle nest is located in a stand of alien trees east of the Project Site. The modelled No-turbine buffer zone must be implemented around the nest to reduce the risk of turbine collisions. Currently Turbines 1–3, 6, 8, 11, 12, 14–17, 19 and 21 are located within this Turbine Exclusion Zone.
- There are two Southern Bald Ibis colonies located within the east of the Project Site. A shaped turbine exclusion zone has been delineated based on modelled flight activity. The modelling workflow incorporated all the flight data collected within the area during the pre-construction monitoring. The model identifies high-risk flight areas by considering associations between the underlying habitat and topography in relation to the recorded Southern Bald Ibis flight data and proximity to roosts.
- High Sensitivity grassland habitat for Yellow-breasted Pipit and Rudd's Lark.
- High Sensitivity wetland habitat should be defined through detailed habitat modelling and then appropriately buffered, movement corridors should also be determined and buffered to accommodate for nocturnal movement and migration for Sensitive Species 23 (as listed by the National Screening Tool). This will be conducted during the EIA Phase of the Project.
- All drainage lines should be buffered by 210m on either side to reduce the risk of turbine collisions.
- Surface water is crucially important for priority avifauna, including several SCC such as Martial Eagle, Lanner Falcon and Secretarybird, and many non-priority species, including several waterbirds. Drainage lines, dams, and wetlands attract waterbirds and several other bird species. Power lines that are placed near these sources of surface water pose a collision risk to birds using the water for drinking and bathing. Drainage lines are also natural flight paths for birds. The grassland habitat in the area is crucially important to SCC such as Denham's Bustard, Secretarybird and Southern Bald Ibis, for foraging and roosting, all three SCC have been recorded in the PAOI.

- Mitigation in the form of Bird Flight Diverters on the OHL is required. The entire length of the OHL should be fitted with Eskom approved Bird Flight Diverters (Figure 24). BFD design specification should conform to types of devices that will be visible at night e.g. LED type bird flight diverters.

HIGH SENSITIVITY – TURBINE EXCLUSION ZONES

- A Martial Eagle nest is located in a stand of alien trees east of the Project Site. Pro-active mitigation in the form of Shutdown on Demand (SDoD) or automated curtailment must be implemented in the medium risk zones. There are several turbines located within this zone.
- There are two Southern Bald Ibis colonies located east of the Project Site. Pro-active mitigation in the form of Shutdown on Demand (SDoD) or automated curtailment must be implemented in the medium risk zones. There are several turbines located within this zone.

11.6 BATS

This scoping report assessed impacts to bats that could occur because of the construction, operation and decommission of the Sheepmoor WEF and grid connection. The assessment was based on 12 months of baseline data on bat activity recorded at the project. Based on these data, the key issue for the WEF will be managing collision impacts to Cape serotine and Egyptian free-tailed bat.

The first mitigation measure proposed to manage risk is to adhere to the no-go buffers which aim to spatially avoid impacts by buffering key habitat features used by bats. This measure is likely to be effective for most bat species recorded at the project, but additional mitigation measures are needed to avoid impacts to free-tailed bats, which forage high in the air, and to reduce residual impacts. Turbine design can be effective, and it is recommended to maintain a minimum blade sweep of at least 30 m. However, free-tailed bats will still collide with turbine blades above this height and as such, the rotor diameter must be limited as much as practicable to minimise the space where collisions might occur. The specific dimensions will be investigated further during the EIA phase of the project. Additionally, blade feathering must be implemented to limit the rotation of turbine blades below the turbine cut-in speed when electricity is not being generated. Based on the proposed project development layout, the Alternative Laydown Area, Alternative O&M buildings and the Alternative substation are located within no-go areas and must be relocated.

Mitigation measures to minimise residual impacts after the application of the above measures include curtailment and acoustic deterrents. As such, the project should consider the cost and feasibility of these measures during the EIA phase. The residual impacts must be monitored using post-construction fatality monitoring for a minimum of two years (Aronson et al. 2020). Curtailment and/or acoustic deterrents must be used if this monitoring indicates that species fatality thresholds have been exceeded (MacEwan et al. 2018) to maintain the impacts to bats within acceptable limits of change and prevent declines in the impacted bat populations.

11.7 SOCIO-ECONOMIC

The findings of the Social Scoping study indicate that the proposed Sheepmoor WEF will create a number of social and socio-economic benefits, including creation of employment and business opportunities during both the construction and operational phase. In addition, the WEF will generate renewable energy for use by mines and industrial operations in the area.

The findings of the study also indicate that the potential negative impacts associated with both the construction and operational phase are likely to be Low Negative with mitigation. The potential negative impacts can therefore be effectively mitigated if the recommended mitigation measures are implemented. The WEF is therefore supported by the initial findings of the Social Scoping study.

11.8 HERITAGE, ARCHAEOLOGY AND PALAEONTOLOGY

The 1969 topographical map indicated that there forty-three (43) settlements, or homesteads, kraals and farm buildings. Most of these were farm labourers' settlements that could have graves. Many of these sites occur in areas that will not be affected by the WEF and related infrastructure. The field survey recorded twelve heritage sites within the study area. Most of these sites will not be affected by the WEF. Those that are currently affected, can be mitigated by relocating the specific infrastructure.

The field survey also confirmed that most of the desktop settlements have human graves associated with them. A 50m sensitivity buffer should be placed around each of these for possible graves. Unfortunately, the presence black wattle plantations has damaged most of these sites, while agricultural activity would have destroyed these sites.

Not all graves should be affected by the WEF. These should be buffered and clearly demarcated, as with the older buildings.

The Battle of Onverwacht occured on one of the hills of the proposed WEF. It is proposed that since this was more of a skirmish, minimal impact would occur if certain conditions are met, including:

- Assistance in removing black wattle trees around the battlefield area,
- Maintenance of the site;
- Erection of markers relating to the battlefield; and
- Undertaking a metal detector survey of all areas to be affected.

Late Iron Age archaeological sites occur within the WEF. These could be mapped and partially excavated if they are to be affected. Similarly, Historical middens relating to early farmhouses would need to be excavated if affected.

While the palaeontology is of very high sensitivity as it forms part of the Vryheid formation, very few significant vertebrate fossils have been found in it. A Chance Find Protocol will need to be initiated for the construction phase.

11.9 VISUAL / LANDSCAPE AND FLICKER

The existing visual condition of the landscape that may be affected by the proposed Sheepmoor WEF and associated grid connection has been described. The study area's scenic quality has been rated high to low within the context of the sub-region. The Project site is in a moderate rated landscape type. Sensitive viewing areas and landscape types have been identified and mapped, indicating potential sensitivity to the Project, mainly for users of the farmsteads, settlements and towns and the R65 and the N2 roads.

Impacts on views are the highest when viewers are sensitive to change in the landscape, and the view is focused on and dominated by the change. The Project's visual impact will cause moderate changes in the landscape that are noticeable to people viewing the Project.

Construction activities include the removal of vegetation, earthworks required to create building terraces for turbines and the preparation of the internal roads. Construction activities would negatively affect the landscape's visual quality and sense of place relative to its baseline. They would contrast with the patterns that define the structure of the immediate landscape and cause a significant change over a local to regional area, resulting in a moderate change to key views. However, the greatest impact would be on the site itself. Mitigation measures are minimal with the greatest effect only at night.

Operational activities include the regular cleaning and maintenance, vegetation management under and around the turbines and powerline servitudes as well as maintenance of all other infrastructural components. Security lighting and other lighting associated with the movement of security vehicles at night. These activities along with the physical presence of the Project components day and night, constitute the visual impact.

Decommissioning and closure activities include the dismantling and removal of all infrastructure and the rehabilitation of the site back to its current, mostly natural, state.

11.10 TRAFFIC AND TRANSPORTATION

Based on the nature and extent of the proposed project, some level of disturbance can be expected on the immediate local road network and regionally because of the construction and operational phases. The overall potential significant impact is expected to be moderate to low during both the construction phase and operational phase, respectively.

During the site visit it was observed that the Provincial Road R65 carries lower traffic volumes than the N2 National Road which already carries a high proportion of trucks including abnormal vehicles. Thus, the preferred local transportation route is the R65 due to its substantially low existing traffic volumes.

It is the opinion of the traffic engineering project team that the impacts associated with the project can be assessed and mitigated to an acceptable level to meet the recommended norms and standards.

11.11 PRELIMINARY SITE SENSITIVITY EVALUATION

Sensitive areas will be reassessed in the EIA phase, and will be based on additional site visits, where necessary. The majority of the turbines are currently out of no-go areas,

however, some turbines were found to be within proximity to noise sensitive receptors as well as some features of heritage and palaeontological significance as well as Aquatic and Avifaunal significance. Noise and heritage buffers will be included in the EIA phase. Visual buffers were delineated but not considered no go areas.

11.12 CONCLUSION

The effect of the potential impacts associated with the construction and operation of the proposed Sheepmoor WEF development can be limited or reduced to acceptable levels through avoidance, minimisation, and the implementation of mitigation measures during the construction, operation and decommissioning phases. Therefore, based on the outcome of the specialist scoping inputs, potential negative impacts associated with the proposed development are anticipated mainly to be of medium to low significance after mitigation, while some positive socio-economic impacts of moderate significance are expected. Areas of concern have been noted, specifically in the Cultural Heritage, Noise and Visual / Landscape themes, where buffers need to be implemented.

Additionally areas of avoidance have been noted, specifically to Avifauna and Aquatic themes, where no-go areas are clearly outlined and implement turbine exclusion zones and rotor swept areas.

Based on the preliminary assessment of impacts for the proposed development the Environmental Assessment Practitioner (EAP) can conclude that the project **should be allowed to proceed into the EIA phase**. The specialist's assessments have identified areas of further investigation, and these will be assessed during the EIA phase, together with any additional impacts or concerns raised during the public participation process. A preliminary layout was produced and provided to specialists for consideration during the scoping phase. This layout will be revised further during the EIA phase of the process to be informed by buffers and constraints provided by specialists. Any additional constraints and buffers recommended by the specialists during the EIA phase, will be taken into consideration and a Final Mitigated Layout will be produced and submitted as part of the Final EIA Report. Comments received from I&APs during the public participation comment period will be taken into consideration to inform the final scoping report and EIA.

12. PLAN OF STUDY FOR EIA

A detailed description of the nature and extent of the proposed Sheepmoor WEF and its associated infrastructure, details regarding the Scoping process followed, as well as the issues identified and evaluated through the Scoping Phase have been included in this Scoping Report. This Section of the report provides the Plan of Study for the Environmental Impact Assessment (EIA) for the proposed development.

The EIA Phase of the study includes detailed specialist studies for those impacts recorded to be of potential significance, as well as on-going public consultation.

12.1 AIM OF THE EIA PHASE

The EIA Phase will aim to achieve the following:

- Provide a detailed assessment of the need and desirability of the proposed development, taking into consideration I&AP comments, specialists studies, as well as guidance documents;
- Provide an overall assessment of the social and biophysical environment affected by the proposed development;
- Assess potentially significant impacts (direct, indirect and cumulative impacts) associated with the proposed development;
- Identify and recommend appropriate mitigation measures for potentially significant environmental impacts; and
- Undertake a fully inclusive public involvement process to ensure that I&AP's are afforded the opportunity to participate, and that their issues and concerns are recorded.
- Address potential environmental impacts and benefits associated with all components of the of the proposed development including the design, construction, operation and decommissioning;
- Develop an Environmental Management Programme which will be required to be implemented during the phases of the development; and

The EIA report will aim to provide the CA with sufficient information to make an informed decision regarding the proposed development. All feasible alternatives (including the no-go alternative) will be assessed.

12.2 CONSIDERATION OF ALTERNATIVES

The following alternatives will be investigated in the EIA:

- The 'do nothing' or no-go alternative;
- Design alternatives;
- Layout Changes; and
- Alternative technologies (i.e., various wind turbine options).

12.3 AUTHORITY CONSULTATION

Consultation with the regulatory authority (i.e. DFFE and Mpumalanga Provincial Department) will be undertaken and will continue throughout the EIA process. On-going consultation will include the following:

- Submission of the Final Scoping Report following a 30-days public review period (and considering of comments received).
- Submission of the EIA Report for a 30-days public review period, as well as the final report including all comments received.
- Consultation and site visit (if required) with the authorities (DFFE) in order to discuss the findings and conclusions of the EIA Report.

12.4 PUBLIC PARTICIPATION PROCESS

A public participation process will be undertaken by ERM in accordance with the requirements of the EIA Regulations. Consultation with key stakeholders and I&APs will be on-going throughout the EIA process. Through this consultation process, stakeholders and I&APs will be encouraged to provide input to the project, and to comment on the findings of the EIA process.

The EIA Report will be made available for public review for a 30-day period prior to the finalisation and submission to the DFFE for review and decision-making. Comments received during the review period will be captured and addressed the comment and responses report which will form part of the final EIA Report will be submitted to the DFFE for decision making.

12.5 METHODOLOGY OF ASSESSMENT OF POTENTIAL IMPACTS

The potential impact that the proposed development may have on each environmental receptor could be influenced by a combination of the sensitivity or importance of the receptor and the predicted degree of alteration from the baseline state (either beneficial or adverse).

Environmental sensitivity (or importance) may be categorised by a multitude of factors, such as the rarity of the species; transformation of natural landscapes or changes to soil quality and land use. The overall significance of a potential environmental impact is determined by the interaction of the above two factors (i.e. sensitivity/importance and predicted degree of alteration from the baseline).

A 7-step approach for the determination of significance of potential impacts was developed by ERM to align with the requirements of Appendix 3 of the EIA Regulations, 2014 (as amended). This 7-step approach was adapted from standard ranking metrics such as the Hacking Method, Crawford Method etc. and complies with the method provided in the EIA guideline document (GN 654 of 2010) and considers international EIA Regulatory reporting standards such as the newly amended European Environmental Impact Assessment (EIA) Directive (2014/52/EU).

Specialists, in their terms of references, will be supplied with this standard method with which to determine the significance of impacts to ensure objective assessment and evaluation, while enabling easier multidisciplinary decision-making.

The approach is both objective and scientific based to allow appointed specialists and EAPs to retain independence throughout the assessment process. This methodology is included in the following subsections.

12.5.1 PREDICTION OF POTENTIAL IMPACTS

The prediction of potential impacts covers the three phases of the proposed development: construction, operation and decommissioning. During each phase, the potential environmental impacts may be different. For example, during the construction phase, traffic volumes are far greater than during the operational life of a WEF.

The project team has experience from environmental studies for other projects in the locality of the proposed development. The team is, therefore, able to identify potential impacts based on their experience and knowledge of the type of development proposed and the local area. Their inputs inform the scope for the S&EIA process.

Each specialist assessment considered:

- The extent of the impact (local, regional or (inter) national);
- The intensity of the impact (low, medium or high);
- The duration of the impact and its reversibility;
- The probability of the impact occurring (improbable, possible, probable or definite);
- The confidence in the assessment; and
- Cumulative impacts.

Following identification of potential environmental impacts, the baseline information was used to predict changes to existing conditions and undertake an assessment of the impacts associated with these changes, which will also inform the PSEIA.

12.5.1.1 ASSESSMENT OF POTENTIAL IMPACTS

The potential impact that the proposed development may have on each environmental receptor could be influenced by a combination of the sensitivity or importance of the receptor and the predicted degree of alteration from the baseline state (either beneficial or adverse).

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The overall significance of a potential environmental impact is determined by the interaction of the above two factors (i.e., sensitivity/importance and predicted degree of alteration from the baseline).

Specialists, in their terms of references, were supplied with a standard method with which to determine the significance of impacts to ensure objective assessment and evaluation, while enabling easier multidisciplinary decision-making. The methodology[14] as outlined below indicates the categories for the rating of impact magnitude and significance.

The assessment methodology that was used is in accordance with the EIA Regulations, 2014 (as amended). The significance of environmental impacts is a function of the environmental aspects

[14] Adapted from T Hacking, AATS – Envirolink, 1998: An innovative approach to structuring environmental impact assessment reports. In: IAIA SA 1998 Conference Papers and Notes.

that are present and to be impacted on, the probability of an impact occurring and the consequence of such an impact occurring before and after implementation of proposed mitigation measures.

Extent (special scale)

L	M	H
Impact is localised within site boundary	Widespread impact beyond site boundary; Local	Impact widespread far beyond site boundary; Regional/national

Duration

L	M	H
Quickly reversible, less than project life, short term	Reversible over time; medium-term to life of project	Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources

Intensity

Type of Criteria	Negative			Positive		
	H-	**M-**	**L-**	**L+**	**M+**	**H+**
Qualitative	Substantial deterioration death, illness or injury, loss of habitat /diversity or resource, severe alteration or disturbance of important processes.	Moderate deterioration, discomfort, Partial loss of habitat /biodiversity /resource or slight or alteration	Minor deterioration, nuisance or irritation, minor change in species/habitat/diversity or resource, no or very little quality deterioration.	Minor improvement, restoration, improved management	Moderate improvement, restoration, improved management, substitution	Substantial improvement, substitution
Quantitative	Measurable deterioration Recommended level will often be violated (e.g., pollution)	Measurable deterioration Recommended level will occasionally be violated	No measurable change; Recommended level will never be violated	No measurable change; Within or better than recommended level.	Measurable improvement	Measurable improvement

Probability of Occurrence

L	M	H
Unlikely; low likelihood; Seldom No known risk or vulnerability to natural or induced hazards.	Possible, distinct possibility, frequent	Definite (regardless of prevention measures), highly likely, continuous

	Low to medium risk or vulnerability to natural or induced hazards.	High risk or vulnerability to natural or induced hazards.

Status of the Impact

The specialist should describe whether the impact is positive, negative or neutral for each parameter. The ranking criteria are described in negative terms. Where positive impacts are identified, the opposite, positive descriptions for criteria will be used.

Degree of Confidence in Predictions

The degree of confidence in the predictions, based on the availability of information and specialist knowledge, is to be stated.

Consequence: (Duration x Extent x Intensity)

Having ranked the severity, duration and spatial extent, the overall consequence of impacts is determined using the following qualitative guidelines:

Intensity = L				
Duration	**H**			
	M			Medium
	L	Low		

Intensity = M				
Duration	**H**			High
	M		Medium	
	L	Low		

Intensity = H				
Duration	**H**			
	M			High
	L	Medium		
		L	**M**	**H**
		Extent		

Positive impacts are ranked in the same way as negative impacts but result in high, medium or low positive consequence.

Overall significance of impacts

Combining the consequence of the impact and the probability of occurrence provides the overall significance (risk) of impacts.

PROBABILITY	**Definite Continuous**	**H**	MEDIUM		
	Possible Frequent	**M**		MEDIUM	
	Unlikely Seldom	**L**	LOW		MEDIUM
			L	M	H
			CONSEQUENCE		

Mitigation Measures

Measures to avoid, reduce or remedy significant adverse impacts identified, are termed mitigation measures. Where the assessment process identifies any significant adverse impacts, mitigation measures are proposed to reduce those impacts where practicable. Such measures include the physical design and operational measures. Design alterations such as the route of the servitude to avoid certain sensitive receptors are mitigation embedded into the design of the proposed development, i.e., embedded mitigation.

This strategy of avoidance, reduction and remediation is a hierarchical one which seeks:

- First to avoid potential impacts;
- Then to reduce those which remain; and
- Lastly, where no other measures are possible, to propose compensatory measures.

Each specialist consultant identified appropriate mitigation measures (where relevant).

12.5.1.2 CUMULATIVE IMPACT ASSESSMENT

In accordance with the EIA Regulations, consideration is also given to 'cumulative impacts'.

Cumulative impacts are those that result from incremental changes caused by past, present or reasonably foreseeable future actions together with the proposed development. Cumulative impacts are the combined impacts of several developments that are different to the impacts from the developments on an individual basis. For example, the landscape impact of one WEF may be insignificant, but when combined with another it may become significant.

For this assessment cumulative impacts are defined and will be assessed in the future baseline scenario, i.e., cumulative impact of the proposed development = change caused by proposed

development when added to the cumulative baseline. The cumulative baseline includes all other identified developments. In the cumulative assessment the effect of adding the proposed development to the cumulative baseline is assessed.

In line with best practice, the scope of this assessment will include all operational, approved or current and planned renewable energy applications (including those sites under appeal), within a 35 km radius of the site. Therefore, all potential projects are included, even though it is unknown how many of these will be constructed.

Renewable energy sites included for cumulative impact assessment are based on the knowledge and status of the surrounding areas at the time of the specialists compiling their assessments, these will be updated as applicable through the EIA process.

A preliminary assessment of cumulative impacts has been made in the Scoping Phase and will be assessed further in the EIA Phase.

12.6 SPECIALIST PLAN OF STUDY

12.6.1 SOIL AND AGRICULTURAL POTENTIAL

Compliance with the allowable development limits will be assessed in the EIA phase, once the footprint of the facility has been finalised.

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

12.6.2 AQUATIC

The following are key recommendations, which are also critical to the proposed mitigations:

- Any of the activities, should also be monitored by the appointed Environmental Officer /Environmental Control Officer (EO/ECO) on a daily basis, during periods of river flow during construction;
- Any points of erosion should be stabilised immediately (sand bags in the short term) using gabions and reno mattress as required. No activities should take place outside of the demarcated servitude, to prevent additional cumulative impacts on these systems;
- The EMPr, must include a Construction Specific Monitoring and Rehabilitation Plan related to the water course and wetland crossings, and specifically to the prevention of erosion and sedimentation as these systems are prone to scour, with rehabilitation options being limited due to the sparse nature of the vegetation; and
- Monitoring should occur on a monthly basis for 6 months post construction and where any unstable soils occur, these must be protected with temporary stabilisation dependent on the scale of the impact i.e. sand bags - hay bales) until areas become revegetated. If any areas require permanent erosion protection (e.g. gabions or stone pitching) then the WULA/GA must be amended to include these areas.

12.6.3 TERRESTRIAL BIODIVERSITY (FLORA AND FAUNA)

The approach to be implemented during the assessment phase will include the following, as well as in accordance with the respective terrestrial biodiversity and species reporting protocols:

- Undertake a comprehensive desktop study to identify potential risks for terrestrial biodiversity inclusive of the national screening tool, relevant regional biodiversity planning frameworks, any previous studies as well as interrogation of applicable databases.
- Undertake seasonal site visits including a preliminary site visit to inform layout design, specifically in terms of broader landscape processes, followed by a more comprehensive site visit to assess the specific layout, and to provide recommendations accordingly.
- Detailed reporting will be comprised of a Terrestrial Biodiversity and Aquatic Screening Report. The screening report will address the following (in line with the gazetted Assessment Protocol requirements):
    - Indicate any assumptions made and gaps in available information. Assessment of all the vegetation types and habitat units within the relevant Regional Planning Frameworks.
    - A desktop-based species list (flora and fauna) highlighting any potential species of special concern categories (endemic, threatened, Red Data species and other protected species requiring permits for destruction/relocation and invasive/exotic weeds) that could be present. Indicate the need for any permitting/licensing or detailed studies that may be required. Site visit will include limited screening for species, but being out of season, it will be limited.
    - Aquatic screening will serve to identify and preliminarily assess aquatic features and processes including watercourses and wetlands and recommend no-go areas associated with these features.
    - Description and assessment of the vegetation/habitat units and site sensitivities ranked into very high, high, medium, low, or very low classes based on potential sensitivity and conservation importance using a standardised methodology (desktop based).
    - A site ecological sensitivity map will be compiled, indicting the sensitivities as described above, inclusive of any aquatic features as far as possible using most recent available aerial photography. No site verification will be conducted.
    - A map indicating any buffers to accommodate Regional Planning requirements (if required).
    - Recommendations based on the findings of the assessment.

This terrestrial biodiversity Scoping Report is aligned with the requirements of the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act, 1998, when applying for EA (GN 320, 20 March 2020).

12.6.4 AVIFAUNA

The following are proposed for the EIA Phase:

- The implementation of four avifaunal surveys, utilising transects, vantage point watches, focal points, and incidental counts, to inform the assessment of the potential impacts of the planned infrastructure within the development footprint. The monitoring protocol is guided by the following:

- Procedures for the Assessment and Minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of NEMA when applying for Environmental Authorisation (Gazetted October 2020)
- Protocol for the specialist assessment and minimum report content requirements for environmental impacts on avifaunal species by onshore wind energy generation facilities where the electricity output is 20MW or more (Government Gazette No. 43110 – 20 March 2020).
- Jenkins, A.R., Van Rooyen, C.S., Smallie, J.J., Anderson, M.D., & A.H. Smit. 2015. 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. Hereafter referred to as the wind guidelines.

- The avifaunal specialists report will be structured around the following terms of reference:
  - Description of the affected environment from an avifaunal perspective.
  - Discussion of gaps in baseline data and other limitations.
  - Description of the methodology that was used for the field surveys.
  - Comparison of the site sensitivity recorded in the field with the sensitivity classification in the DFFE National Screening Tool and adjustment if necessary.
  - Provision of an overview of all applicable legislation.
  - Provision of an overview of assessment methodology.
  - Identification and assessment of the potential impacts of the proposed development on avifauna including cumulative impacts.
  - Provision of sufficient mitigation measures to include in the Environmental Management Programme (EMPr).
  - Conclusion with an impact statement whether the wind energy facility is fatally flawed or may be authorised.
- Throughout the Environmental Impact Assessment (EIA) phase, refinement of the Martial Eagle buffers will continue. This process will involve the analysis and integration of supplementary Martial Eagle monitoring datasets. Moreover, comprehensive modeling will be applied to assess the impact on Critically endangered wetland species and grassland passerines, with the findings documented within the Final EIA report.

12.6.5 BATS

The proposed project can be approved to continue to the EIA phase, considering that the overall impact to bats was assessed as moderate after the application of the mitigation measures proposed to avoid and minimise impacts to bats. However, on a species level, the project presents differential risk and impacts to bats must be managed adaptively during the operational phase, particularly for those species (e.g., Egyptian free-tailed bat and Cape serotine) for which high risk is predicted during some periods. This adaptive management will be guided by the Environmental Management Programme for bats which must include the development of a

Biodiversity Management Plan (BMP) to manage impacts to bats during the operation of the facility.

The BMP for bats must be developed by a bat ecologist before the commencement of operation and must include the post-construction fatality monitoring plan design, fatality thresholds calculations and rationale, a curtailment plan, and an adaptive management response plan that provides a timeous action pathway for mitigation, including roles and responsibilities, should fatality thresholds be exceeded.

12.6.6 VISUAL / LANDSCAPE AND FLICKER

The significance of these high-level impacts must be further investigated and rated in the Assessment Phase of the ESIA using computer modelling techniques that establish visibility (viewshed analyses), flicker shadow and visual intrusion using simulations representative of Project activities. The results of the I&AP process will also be known, which will establish receptor sensitivity to the Project.

The following issues will be addressed:

- Establish/confirm public concern for the WEF, specifically as it concerns visual issues;
- Confirm the visibility and visual intrusion of project activities using computer modelling techniques (viewshed analyses and photomontage simulations and flicker analysis); and
- Establish specific management measures (mitigation) to reduce the anticipated impact of the Project where appropriate.

12.6.7 HERITAGE, ARCHAEOLOGY AND PALAEONTOLOGY

The chance of significant fossils being found on this site are Low, but not Zero. Consequently a "Chance Find Protocol" has been included to cover this eventuality.

No further palaeontological work is required, unless triggered by the "Chance Find Protocol", which must form part of the Environmental Management Programme (EMPr) for the site'

12.6.8 NOISE

The following will be undertaken during the EIA 149 phase:

- Data (layout and SPL of selected WTG) as received from the developer will be used to model the potential noise impact. The following information will be considered:
    - The SPL details of a WTG that may be used at this WEF;
    - The latest WEF layout to be assessed;
    - The surface contours of the project focus area;
    - Surface and meteorological constants;

The potential impact will be evaluated (where possible) in terms of the nature (description of what causes the effect, what/who might be affected and how it/they might be affected), as well as the extent of the impact;

- The potential significance of the identified issues will be calculated based on the evaluation of the issues/impacts;

- The development of an EMPr and a proposal of potential mitigation measures (if required); and
- Recommendations.

Further study is required, and it is recommended that a full Environmental Noise Impact Assessment study be conducted for the WEF.

12.6.9 SOCIO-ECONOMIC

The proposed approach to the SIA is based on the Guidelines for SIA endorsed by Western Cape Provincial Environmental Authorities (DEA&DP) in 2007. The Guidelines are based on accepted international best practice guidelines, including the Guidelines and Principles for Social Impact Assessment (Inter-organizational Committee on Guidelines and Principles for Social Impact Assessment, 1994) and IAIA Guidance for Assessing and Managing Social Impacts (2015). The approach to the study will involve:

- Collection and review of reports and baseline socio-economic data on the area. This includes socio-economic characteristics of the affected areas, current and future land uses, and land uses planning documents relating to the study area and surrounds.
- Identification of the components associated with the construction and operational phase of the proposed project, including estimate of total capital expenditure, number of employment opportunities created and breakdown of the employment opportunities in terms of skill levels (low, medium and high skilled), breakdown of wages per skill level, assessment procurement policies etc.
- Site visit and interviews with key affected parties, including local communities, local landowners, key government officials (local and regional), the client, local farmers associations, tourism and conservation officials, chamber of commerce etc.
- Review of key findings of the key specialist studies that have a bearing on the SIA, such as the Visual Impact Assessment (VIA). This information will also be used to inform the engagement with the affected landowners.
- Identification and assessment of key social issues and assessment of potential impacts (negative and positive) associated with the construction, operational and decommissioning phase of the project.
- Identification and assessment of cumulative impacts (positive and negative).
- Identification of appropriate measures to avoid, mitigate, enhance, and compensate for potential social impacts.
- Preparation of Social Impact Assessment (SIA) Report.

Interviews will be undertaken with key stakeholders and interested and affected parties during the assessment phase.

12.6.10 TRAFFIC AND TRANSPORTATION

The proposed development of the WEF will have a notable increase in traffic volumes on the road network during the peak construction phase. The EIA phase will provide the assessment of these impact of these additional traffic volumes, on the road network within the study area.

In accordance with the purpose of Scoping, the environment in the project area was primarily assessed through site visits and appraisals, desktop screening, incorporating existing information from previous studies, and input received from client/authorities. A refinement of all maps will also be undertaken in the EIA phase, if necessary

APPENDIX A SCREENING TOOL REPORT

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